Section 3 – Household and Employment Forecast

Metro 2035 Forecast of Households and Employment

The Clackamas County Transportation System Plan forecast growth is based on the Metro 2035 Forecast of changes to the number of households and jobs at the Traffic Analysis Zone (TAZ) level. The initial phase of the TSP process (Existing Conditions Analysis) used the 2035 Beta Version of the Household and Employment Forecast as the basis for the Regional Travel Demand Model traffic forecasts.

Later in the TSP process, the Preferred Transportation System Analysis was conducted using the 2035 Gamma Version of the Household and Employment Forecast as the basis for the Regional Travel Demand Model traffic forecasts.

Changes in the model's operation that resulted from a revised household and employment forecast and a new mode split table (derived from the 2011 Regional Household Travel Survey) produce a lower level of forecast traffic in 2035 than was seem during the earlier model runs.

70% Growth Forecast Scenario Technical Memo

Some Public Advisory Committee (PAC) members have expressed skepticism as to the accuracy of the most recent 2035 Metro Household and Employment Forecast based on their variety of views on future economic growth, energy supply and global warming, and concerns about regional forecasting methodologies and assumptions. The PAC discussed a number of alternative growth scenarios before reaching a consensus to recommend that the staff review a scenario that reflects 70% of the growth projected in the Metro Gamma Forecast

The PAC agreed not to recommend a no-growth scenario because of the major changes that would be required in regional forecasting assumptions, including the following:

- Natural growth, the amount the regional birth exceeding regional deaths, has historically accounted for 30% to 50% of the region's growth. Zero population growth would assume an equal number of births and deaths, which has never been the case in this County.
- Net migration, the difference between the number of people moving into the region and out of the region, has typically been a positive numbers, i.e., more people have moved into the region than out of the region. While it is possible to have a net regional outmigration under certain circumstance, it is unlikely that this would occur with a large enough difference to offset natural growth over the next 20-plus years.

Population Forecasting and the TSP Update July 2012

FACT: Clackamas County, along with all Oregon cities and counties that create transportation system plans, is required to use a coordinated population forecast for its' planning. Because part of Clackamas County is inside the Metro Boundary, the County has two options for what population and employment forecast data is used:

1. Use the population and employment forecasts that Metro uses in the Regional Transportation Plan (RTP), **or**
2. Develop an alternative forecast, coordinated with Metro, to account for changes to comprehensive plans or land use regulations that were adopted locally after the RTP was adopted by Metro.

BACKGROUND: The State of Oregon has required that land use and transportation plans be based on a coordinated population forecast since the mid 1970's. Coordinated population forecasts are the responsibility of counties (ORS 195.036) with the exception of the area within the Metro urban growth boundary (UGB).

- The area of Clackamas County inside the Metro urban growth boundary is included in Metro's forecast that is used for state land use and transportation planning.
- Clackamas County has not conducted a separate coordinated population forecast for the area outside the Metro boundary for more than two decades. The County is currently working with rural cities to develop a coordinated forecast in conjunction with the update of the Metro forecast.
- Metro, a Metropolitan Planning Organization (MPO), is also responsible for population and employment forecasting for use in regional transportation planning (federal) in the Portland-Beaverton-Vancouver Oregon-Washington Primary Metropolitan Statistical Area (PMSA). This PMSA consists of seven counties – Clackamas, Washington, Multnomah, Yamhill and Columbia in Oregon, and Clark and Skamania in Washington. This forecast, which is updated every five years, covers all of Clackamas County.

The current Clackamas County TSP Update process must be consistent with Metro's current household and employment forecast through 2035. (The population forecast is developed from the household forecast.) This forecast (see below) is expected to be adopted by Metro by the end of 2012 and then forwarded to the State Land Conservation and Development Commission for review.

Most Recent Metro Forecast	2010 Households	2035 Households	2010 – 2035 Change	2010 Employment	2035 Employment	2010 – 2035 Change
Clackamas County	146,324	205,369	59,045	137,946	210,340	72,394
Multnomah County	304,649	442,778	138,129	419,164	597,532	178,368
Washington County	202,647	294,174	93,527	232,019	382,310	150,291
Clark County	158,110	228,392	70,282	127,267	222,029	94,762
TOTAL	**811,730**	**1,170,713**	**358,983**	**916,396**	**1,412,211**	**495,815**

Metro Household and Employment Forecast Model Components

(For more information on the components reviewed below, go to: http://www.oregonmetro.gov/index.cfm/go/by.web/id=39026.)

1. The Metro Regional Population Forecast uses a standard population cohort survival methodology. This methodology estimates future populations using basic demographic data broken down into *cohorts* – age and gender specific groups. The forecasts use the size of each age group in the base year population, and the expected deaths rates and expected migration for each age cohort during the forecast period, plus the estimated number of new births, to estimate the future population.

- The mortality rates are age-specific, based on the U.S. Census middle series assumptions and further calibrated to base year vital statistics for the region as a whole.
- New birth cohorts are generated by applying age-specific fertility assumptions to the female population of child-bearing age (assumed to be 10 to 49 years old), based on the U.S. Census middle series assumptions and further calibrated to base year vital statistics for the region as a whole.
- Net migration is projected from an econometric equation and disaggregated into age groups based on census distributions.

2. The Metro Regional Employment Forecast is based on an econometric forecasting model that describes regional economic behavior. It Includes equations for employment sectors, wage sectors, income components, population and migration, productivity, inter-industry demand variables and a number of identity equations.

3. The Regional Land Supply Model is a recently-updated GIS-based model that estimates the available land supply for residential and employment land uses at the parcel level for the Portland Region.

4. The Metroscope Model allocates the forecast household and employment growth to the available land supply in the region.

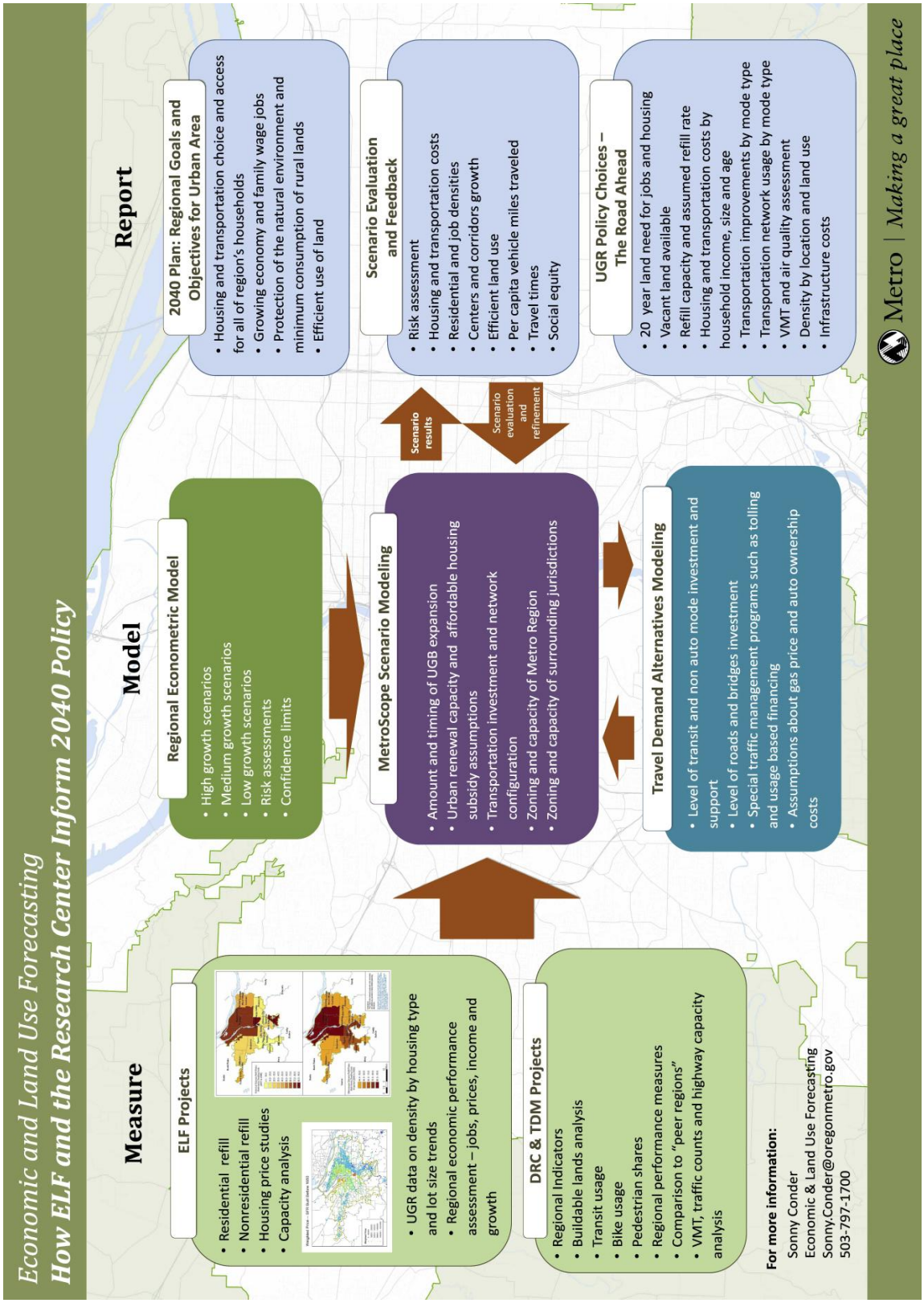
- It uses output from the **Regional Travel Demand Model** (see below) in the allocation process.
- It uses two internal real estate location models, one for residential location and one for nonresidential location, that
    - predict the locations of households and employment respectively,
    - measure the amount of land consumed by development,
    - measure the amount of built space produced, and
    - measure the prices of land and built space by zone in each forecast time period.

5. The Regional Travel Demand Model:

- Predicts travel activity levels by mode (bus, rail, car, walk or bike) and road segment;
- Estimates travel times between transportation analysis zones (TAZs) by time of day, and
- Produces a measure of the cost perceived by travelers in getting from any one TAZ to any other.

Metro Economic and Land Use Forecasting (see graphic, below)

The following graphic shows the relationship between the various measures, models and reports used by Metro for economic and land use forecasting. The forecasting is done by the Metro Research Center that is made up of three divisions: Data Resource Center, Transportation Research and Modeling Services, and Economic and Land Use Forecasting (ELF).



Population: 1980, 1990, 2000 and 2010
USA; State of Oregon; Clackamas County, Multnomah County & Washington County, Oregon, and Clark County, Washington

	Population Count				Metro Forecast @ 2.57 persons per	
AREA	April 1, 1980	April 1, 1990	April 1, 2000	April 1, 2010	*2025 **	2035
USA	226,548,632	248,709,873	281,421,906	308,745,538		
Oregon	2,633,156	2,842,337	3,421,437	3,831,074		
Clackamas County	**241,911**	**278,850**	**338,387**	**375,992**	***467,131***	**510,040**
Multnomah County	562,647	583,887	660,486	735,334	*1,014,263*	1,137,939
Washington County	245,860	311,554	445,348	529,710	*652,395*	756,027
Clark County, WA	192,227	238,053	345,238	425,363	*553,822*	586,967
Four County Total	**1,242,645**	**1,412,344**	**1,789,459**	**2,066,399**	***2,687,611***	**2,990,974**

	Numeric Change in Population				**Metro Forecast @ 2.57 persons per**	
AREA		1980-1990	1990-2000	2000-2010	*2025 **	2035
USA		22,161,241	32,712,033	27,323,632		
Oregon		209,181	579,100	409,637		
Clackamas County		**36,939**	**59,537**	**37,605**	***91,139***	**42,909**
Multnomah County		21,240	76,599	74,848	*278,929*	123,676
Washington County		65,694	133,794	84,362	*122,685*	103,633
Clark County, WA		45,826	107,185	80,125	*128,459*	33,145
Four County Total		**169,699**	**377,115**	**276,940**	***621,212***	**303,363**

		Percent Change in Population			**Metro Forecast @ 2.57 persons per**	
AREA		1980-1990	1990-2000	2000-2010	*2025 **	2035
USA		9.8%	13.2%	9.7%		
Oregon		7.9%	20.4%	12.0%		
Clackamas County		**15.3%**	**21.4%**	**11.1%**	***24.2%***	**9.2%**
Multnomah County		3.8%	13.1%	11.3%	*37.9%*	12.2%
Washington County		26.7%	42.9%	18.9%	*23.2%*	15.9%
Clark County, WA		23.8%	45.0%	23.2%	*30.2%*	6.0%
Four County		**13.7%**	**26.7%**	**15.5%**	***30.1%***	**11.3%**

* 2025 Forecast numbers are for a 15 year growth period - i.e., 2010 to 2025 instead of a 10 year period

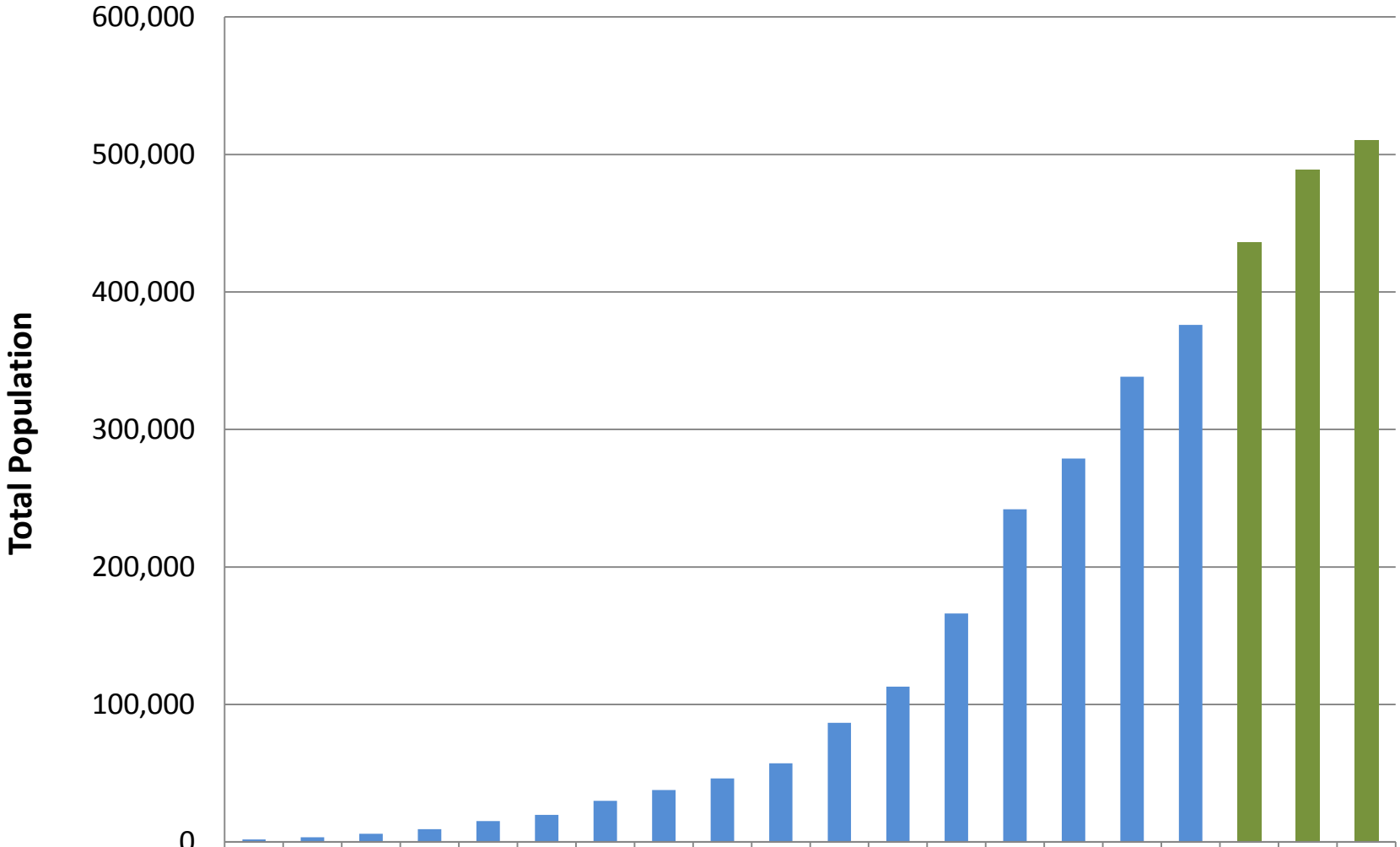
2025 and 2035 Houshold Metro Forecast - Gamma Forecast

Population for Oregon's Counties
NOTE: Data for 1980, 1990, and 2000 adjusted based on the Accuracy and Coverage Evaluation.
Source: U.S. Bureau of Census
Compiled by Oregon Office of Economic Analysis
(Web site: http://www.pdx.edu/prc/)

Population for US and Clark County
Source: U.S. Bureau of Census and
Washington State, Office of Financial Management
(Web site: http://www.ofm.wa.gov/)

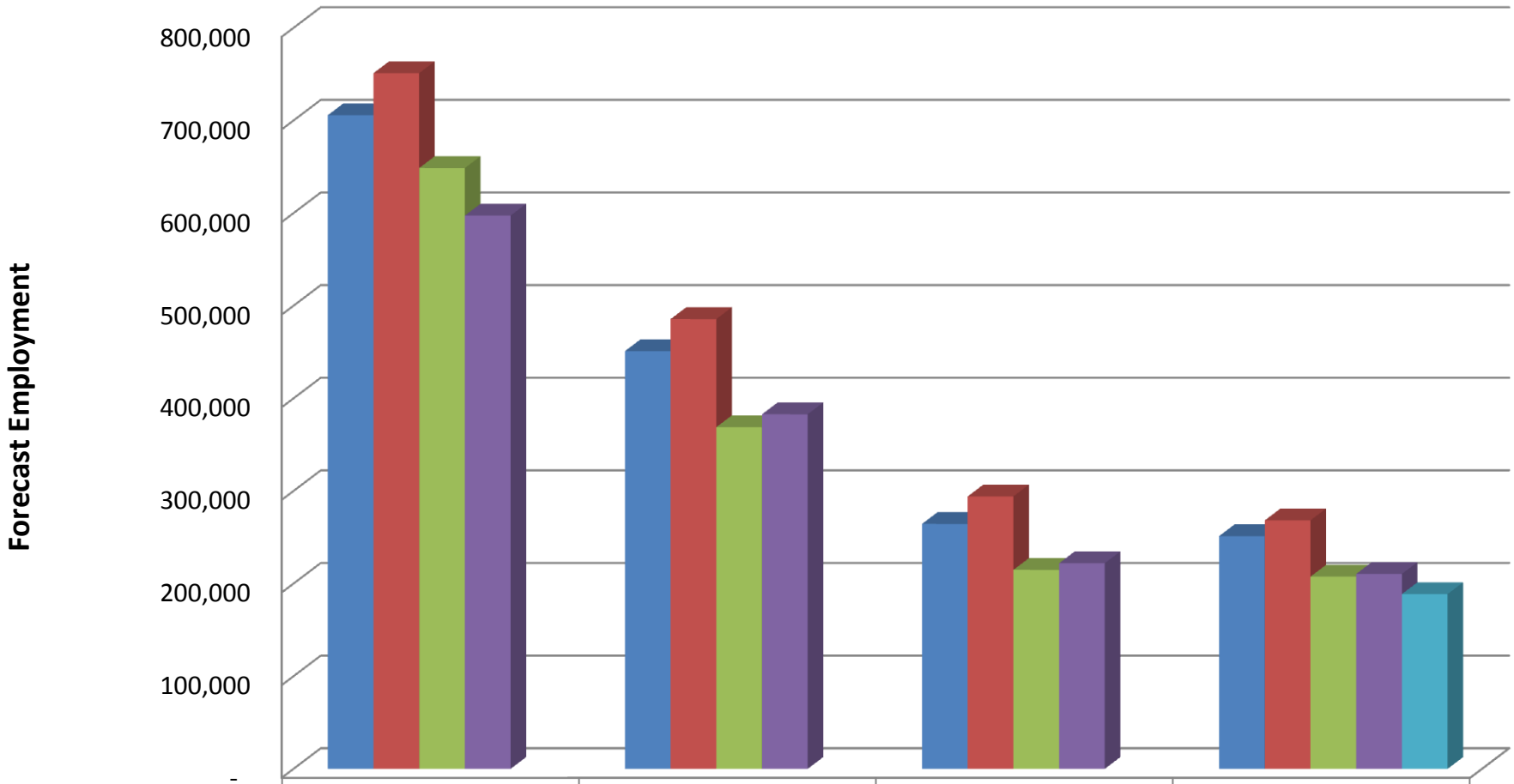
Clackamas County - Historic and Estimated Population

Source: US Census, Metro - Gamma Forecast, Clackamas County



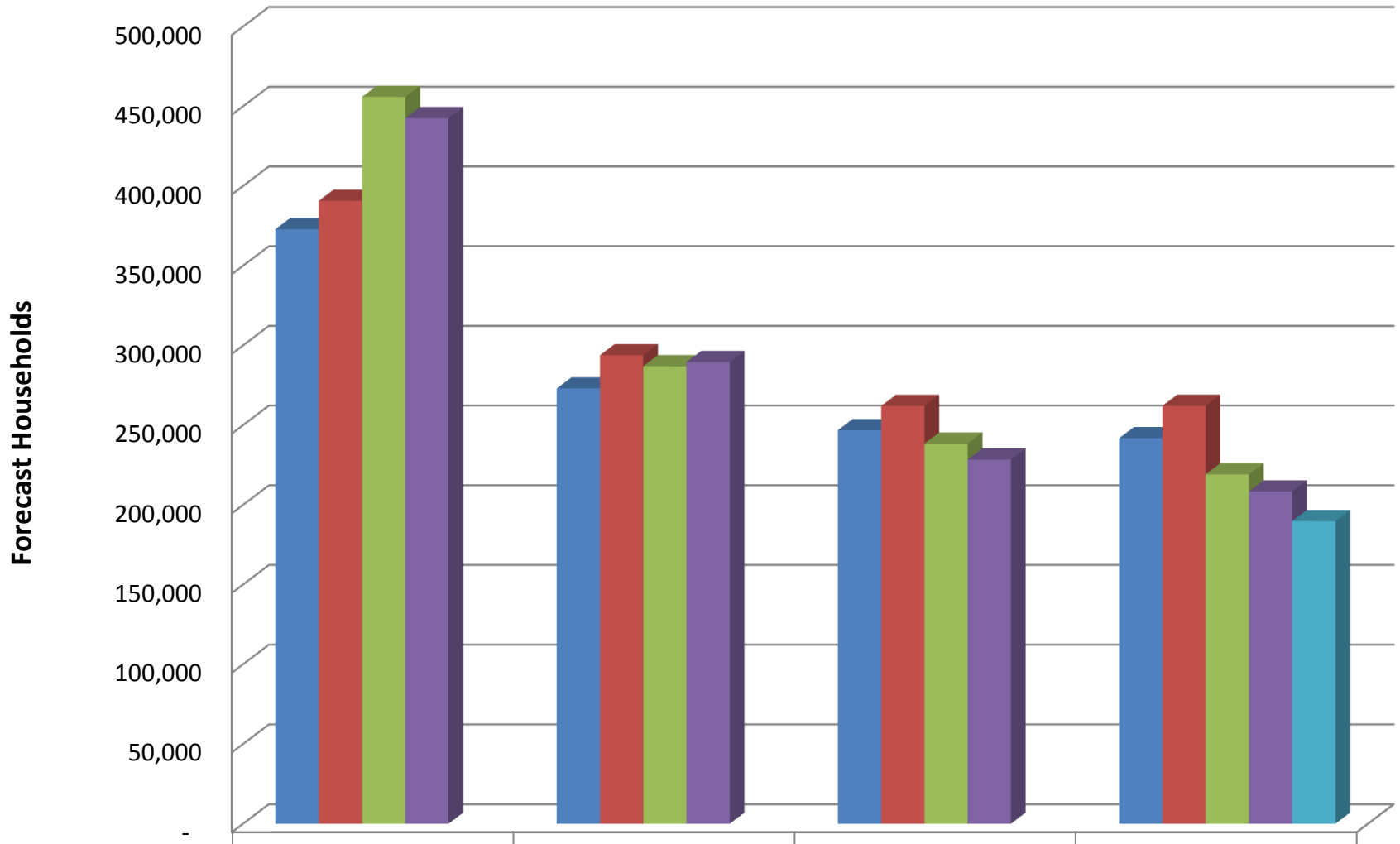
	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2020	2030	2035
Clackamas County Population	1,859	3,466	5,993	9,260	15,233	19,658	29,931	37,698	46,205	57,130	86,716	113,038	166,088	241,911	278,850	338,391	375,992	436,144	488,585	510,040

Last Four Employment Forecasts and Reduced Growth



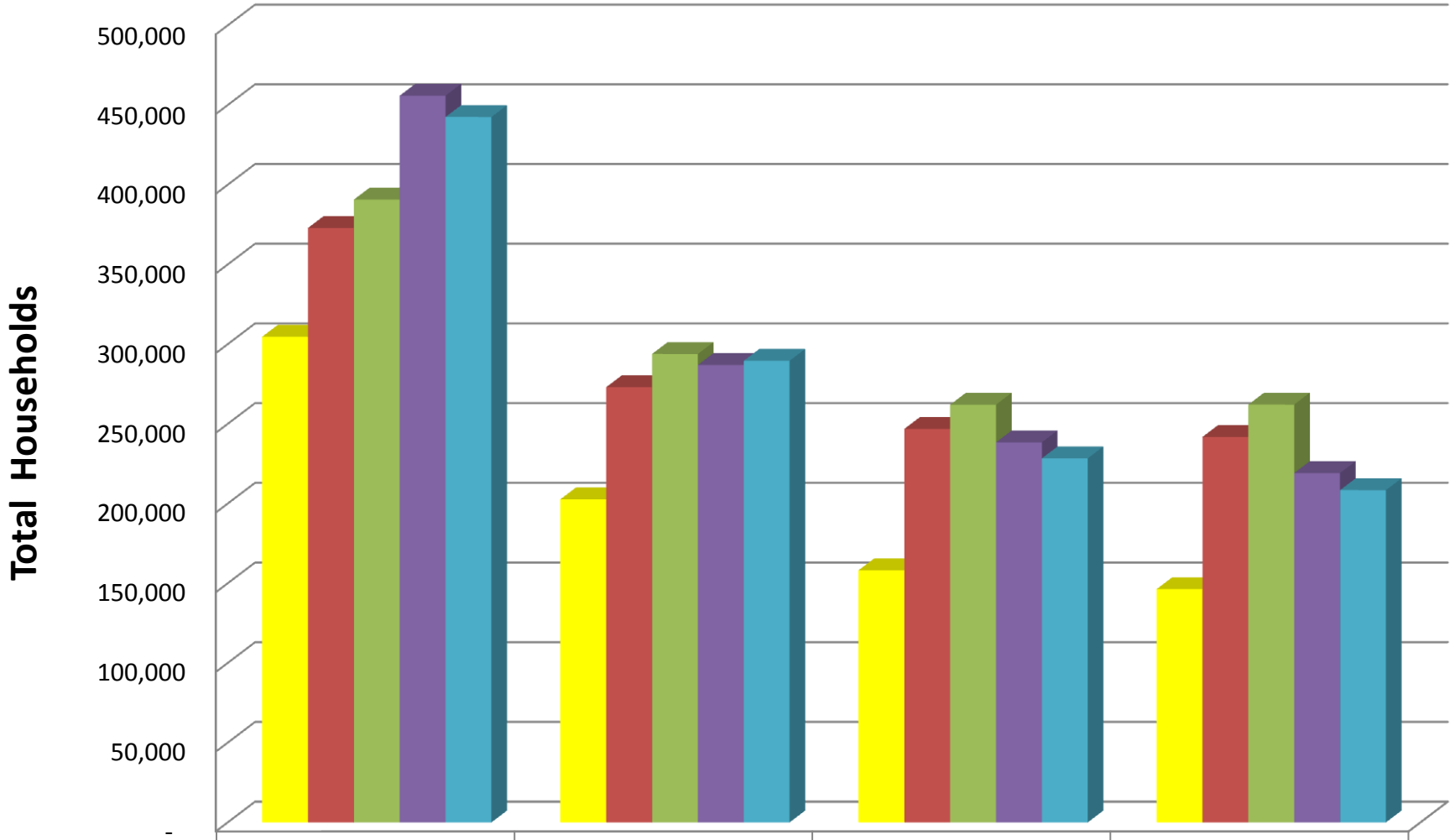
	Multnomah County	Washington County	Clark County	Clackamas County
Gen 2.3 - 2006	705,721	450,970	264,430	251,286
FC RTP - 2009	751,139	485,596	294,144	268,273
Beta - 2011	648,670	368,902	214,815	207,538
Gamma - 2012	597,331	382,812	222,020	210,444
30 % Less Growth				188,694

Last Four Household Forecasts and Reduced Growth



	Multnomah County	Washington County	Clark County	Clackamas County
Gen 2.3 - 2006	372,913	272,998	246,850	241,821
FC RTP - 2009	390,690	293,847	262,048	262,101
Beta - 2011	455,905	286,941	238,417	219,148
Gamma - 2012	442,546	289,592	228,392	208,437
30% Less Growth				189,803

Existing Households and Last Four Forecasts



	Multnomah County	Washington County	Clark County	Clackamas County
Existing - 2010	304,649	202,647	158,110	146,324
Gen 2.3 - 2006	372,913	272,998	246,850	241,821
FC RTP - 2009	390,690	293,847	262,048	262,101
Beta - 2011	455,905	286,941	238,417	219,148
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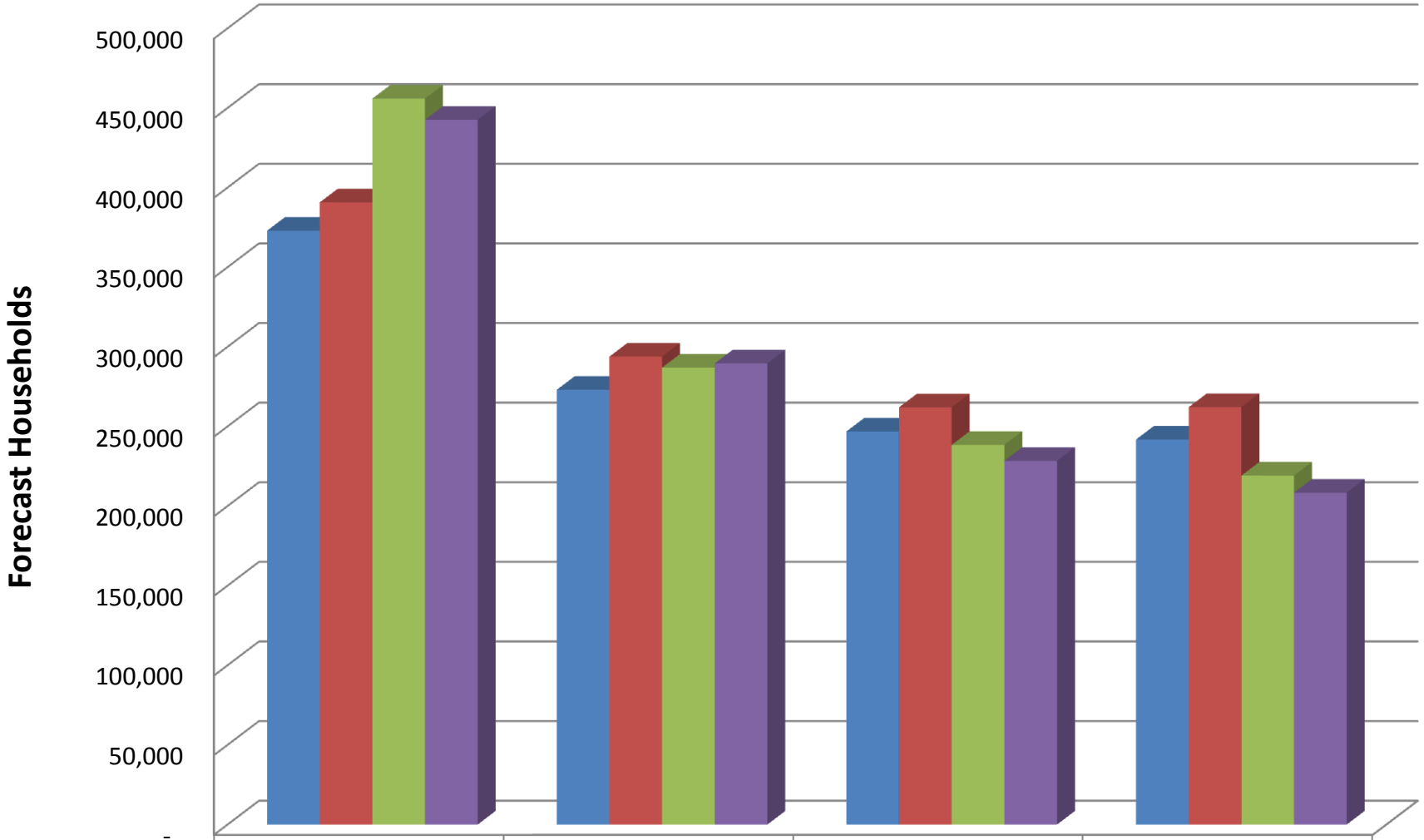
Last Four Household Forecasts



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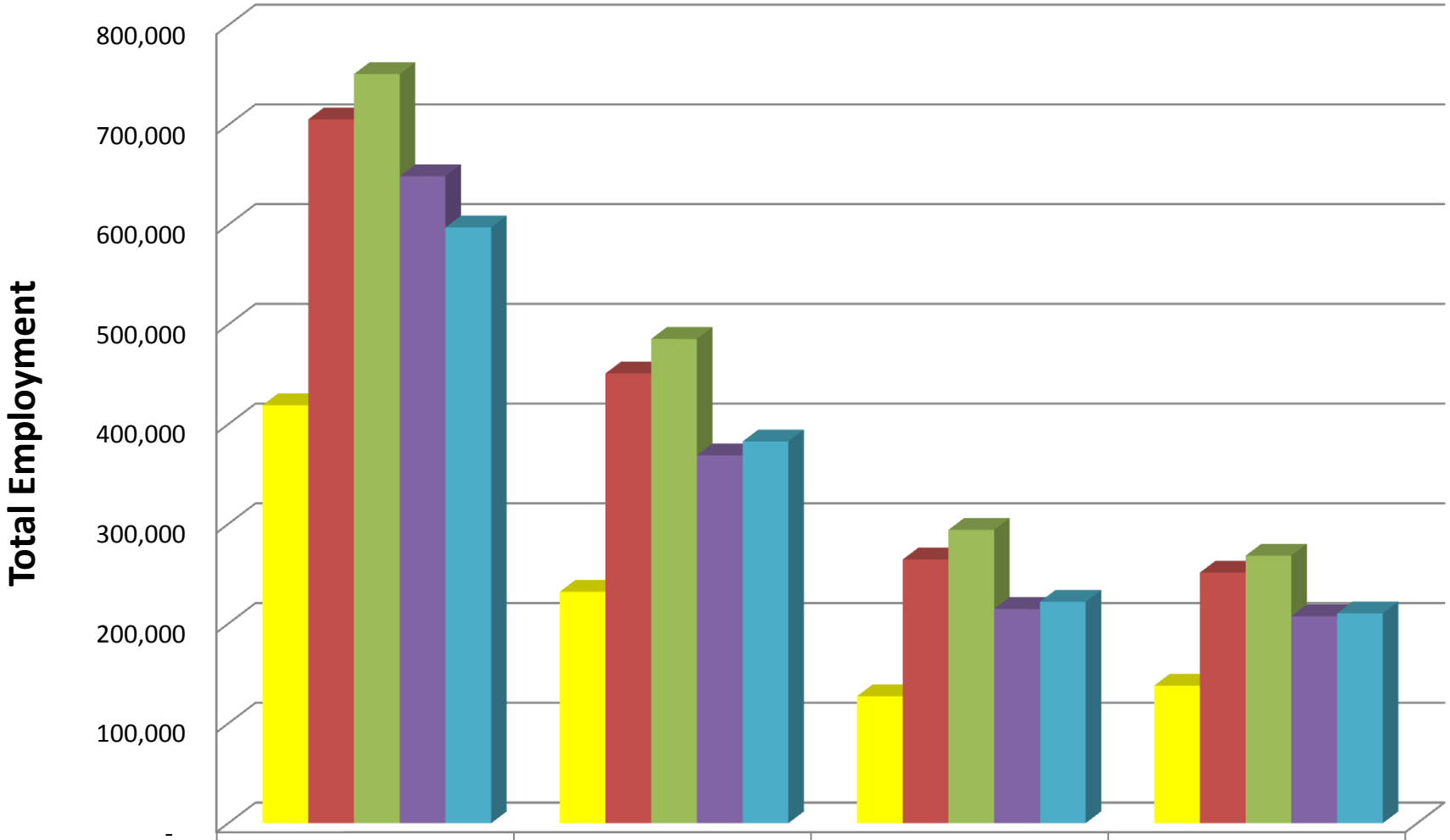
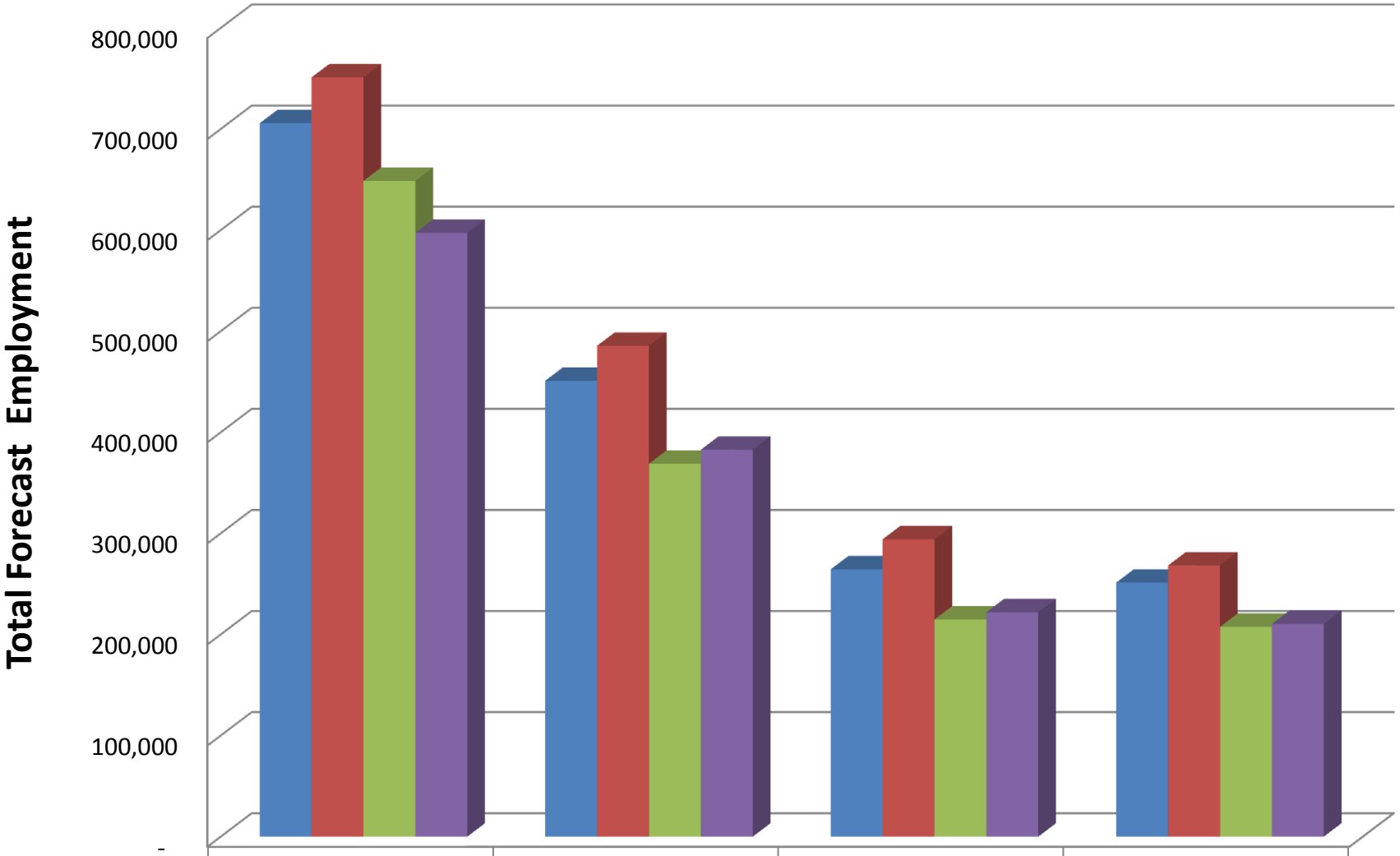
Existing Employment and Last Four Forecasts



	Multnomah County	Washington County	Clark County	Clackamas County
Existing - 2010	419,164	232,019	127,267	137,946
Gen 2.3 - 2006	705,721	450,970	264,430	251,286
FC RTP - 2009	751,139	485,596	294,144	268,273
Beta - 2011	648,670	368,902	214,815	207,538
Gamma - 2012	597,331	382,812	222,020	210,444

Last Four Employment Forecasts



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This table contains 1st draft data which has not been reviewed or edited.

Metro 2035 (Gamma Version) Forecast by Clackamas County TSP Area	CPO / City / Hamlet / Village based on Traffic Analysis Zones	2010 Households Reviewed by Local Jurisdictions	2025 Households Reviewed by Local Jurisdictions	2035 Metroscope Household Forecast Allocation	*Change in Number of Households 2010-2035*	2010 Total Employment Reviewed by Local Jurisdictions	2025 Total Employment Reviewed by Local Jurisdictions	2035 Metroscope Total Employment Allocation	*Change in Total Employment 2010 -2035*
East	Boring	1,674	1,917	1,920	***246***	1,781	2,921	3,433	***1,652***
East	Bull Run	376	381	430	***54***	94	117	128	***34***
East	Cottrell	935	1,103	1,105	***170***	745	848	886	***141***
East	Eagle Creek Barton	1,393	1,749	1,783	***390***	311	387	423	***112***
East	Estacada	1,658	2,162	2,582	***924***	1,427	2,570	3,109	***1,682***
East	Estacada CPO	1,611	1,709	1,899	***288***	270	316	341	***71***
East	Firwood	1,746	1,967	2,218	***472***	251	308	335	***84***
East	Sandy	4,325	5,691	6,635	***2,310***	3,181	5,494	6,630	***3,449***
East	Sandy CPO	745	909	923	***178***	159	200	216	***57***
East	Villages at Mt Hood / Government Camp	1,997	2,205	4,246	***2,249***	1,360	1,703	1,910	***550***
East Total		**16,460**	**19,793**	**23,741**	***7,281***	**9,579**	**14,864**	**17,411**	***7,832***
Northwest	Far West	1,326	2,902	3,486	***2,160***	665	1,208	1,423	***758***
Northwest	Ladd Hill	228	288	465	***237***	98	112	132	***34***
Northwest	Lake Oswego	15,492	17,825	18,785	***3,293***	18,236	22,247	24,603	***6,367***
Northwest	Lake Oswego USB	1,375	1,613	1,648	***273***	296	368	397	***101***
Northwest	Stafford Hamlet	606	645	646	***40***	646	732	767	***121***
Northwest	Stafford Tualatin Valley	501	562	564	***63***	143	160	166	***23***
Northwest	Tualatin	1,088	1,254	1,261	***173***	1,666	1,757	1,809	***143***
Northwest	West Linn	10,252	11,747	11,988	***1,736***	4,252	5,823	6,533	***2,281***
Northwest	Wilsonville	7,596	10,560	11,400	***3,804***	12,694	17,793	20,264	***7,570***
Northwest Total		**38,464**	**47,396**	**50,243**	***11,779***	**38,696**	**50,200**	**56,093**	***17,397***

Metro 2035 (Gamma Version) Forecast by Clackamas County TSP Area	CPO / City / Hamlet / Village based on Traffic Analysis Zones	2010 Households Reviewed by Local Jurisdictions	2025 Households Reviewed by Local Jurisdictions	2035 Metroscope Household Forecast Allocation	*Change in Number of Households 2010-2035*	2010 Total Employment Reviewed by Local Jurisdictions	2025 Total Employment Reviewed by Local Jurisdictions	2035 Metroscope Total Employment Allocation	*Change in Total Employment 2010 -2035*
Southwest	Aloha Butteville	252	291	288	***36***	374	426	449	***75***
Southwest	Barlow	191	203	196	***5***	567	719	769	***202***
Southwest	Beavercreek Hamlet	2,529	3,211	4,458	***1,929***	654	1,335	1,843	***1,189***
Southwest	Canby	6,628	10,662	11,579	***4,951***	5,592	6,143	9,082	***3,490***
Southwest	Carus	714	850	900	***186***	209	269	307	***98***
Southwest	Carver - Logan	610	743	789	***179***	140	194	226	***86***
Southwest	Central Point Leland	965	2,429	2,976	***2,011***	231	303	380	***149***
Southwest	Clarks Highland	630	652	710	***80***	81	99	109	***28***
Southwest	Colton	1,786	2,026	2,120	***334***	502	601	660	***158***
Southwest	Holcomb-Outlook	1,741	2,417	2,690	***949***	512	637	700	***188***
Southwest	Molalla	2,882	3,280	3,933	***1,051***	1,921	3,048	3,661	***1,740***
Southwest	Molalla Prairie Hamlet	861	1,103	1,326	***465***	762	1,022	1,188	***426***
Southwest	Mulino Hamlet	1,700	1,811	2,099	***399***	540	628	674	***134***
Southwest	Oregon City	11,974	15,514	17,047	***5,073***	14,388	19,487	22,486	***8,098***
Southwest	Redland Fischers Mill	1,352	1,734	1,866	***514***	305	386	434	***129***
Southwest	South Canby	2,026	2,161	2,238	***212***	1,704	1,835	1,907	***203***
Southwest	South Clackamas County	975	988	1,076	***101***	174	209	231	***57***
Southwest Total		**37,816**	**50,075**	**56,291**	***18,475***	**28,656**	**37,341**	**45,105**	***16,449***

Metro 2035 (Gamma Version) Forecast by Clackamas County TSP Area	CPO / City / Hamlet / Village based on Traffic Analysis Zones	2010 Households Reviewed by Local Jurisdictions	2025 Households Reviewed by Local Jurisdictions	2035 Metroscope Household Forecast Allocation	*Change in Number of Households 2010-2035*	2010 Total Employment Reviewed by Local Jurisdictions	2025 Total Employment Reviewed by Local Jurisdictions	2035 Metroscope Total Employment Allocation	*Change in Total Employment 2010 -2035*
CRC / CIA	Clackamas	1,935	2,282	2,795	***860***	15,694	20,041	21,801	***6,107***
CRC / CIA	Damascus	3,836	9,699	9,799	***5,963***	1,597	2,938	4,640	***3,043***
CRC / CIA	Grant Park	104	350	351	***247***	38	74	97	***59***
CRC / CIA	Happy Valley	6,224	11,808	12,565	***6,341***	1,455	3,658	4,768	***3,313***
CRC / CIA	Milwaukie	9,172	10,416	10,813	***1,641***	11,869	14,489	15,804	***3,935***
CRC / CIA	North Clackamas	311	334	376	***65***	2,447	3,363	3,833	***1,386***
CRC / CIA	Rock Creek	1,469	2,617	2,652	***1,183***	606	992	1,178	***572***
CRC / CIA	Southgate	5,855	6,386	6,910	***1,055***	10,560	13,843	15,420	***4,860***
CRC / CIA	Sunnyside United Neighbors	4,658	5,569	5,950	***1,292***	6,988	9,132	10,546	***3,558***
CRC / CIA Total		**27,709**	**43,075**	**45,301**	***17,592***	**40,694**	**54,687**	**62,667**	***21,973***
McLoughlin	Gladstone	4,602	5,049	5,402	***800***	2,156	2,750	3,067	***911***
McLoughlin	Jennings Lodge	2,164	2,352	2,516	***352***	1,235	1,542	1,683	***448***
McLoughlin	North Clackamas	2,464	2,580	2,695	***231***	1,839	2,243	2,494	***655***
McLoughlin	Oak Grove	10,790	11,443	12,270	***1,480***	4,531	5,760	6,401	***1,870***
McLoughlin Total		**20,020**	**21,424**	**22,883**	***2,863***	**9,761**	**12,295**	**13,645**	***3,884***

County Totals		***2010***	***2025***	***2035***	***Change***	***2010***	***2025***	***2035***	***Change***
Clackamas County Total		**140,469**	**181,763**	**198,459**	***57,990***	**127,386**	**169,387**	**194,920**	***67,534***
Clark County Total		**158,110**	**215,495**	**228,392**	***70,282***	**127,267**	**187,420**	**222,029**	***94,762***
Multnomah County Total		**304,649**	**394,655**	**442,778**	***138,129***	**419,164**	**533,818**	**597,532**	***178,368***
Washington County Total		**202,647**	**253,850**	**294,174**	***91,527***	**232,019**	**325,342**	**382,310**	***150,291***
4 County Total		**805,875**	**1,045,763**	**1,163,803**	**357,928**	**905,836**	**1,215,967**	**1,396,791**	***490,955***

Average Annual Growth		***Households***	***2010 to 2025***	***2025 to 2035***	***% Change***	***Employment***	***2010 to 2025***	***2025 to 2035***	***% Change***
Clackamas County Total			2,753	1,670	***60.6%***		2,800	2,553	***91.2%***
Clark County Total			3,826	1,290	***33.7%***		4,010	3,461	***86.3%***
Multnomah County Total			6,000	4,812	***80.2%***		7,644	6,371	***83.4%***
Washington County Total			3,414	4,032	***118.1%***		6,222	5,697	***91.6%***
4 County Total			**15,993**	**11,804**	***73.8%***		**20,675**	**18,082**	***87.5%***

Wednesday, July 17, 2013

Recent Changes to the Regional Travel Demand Model

Recent changes to Metro's Regional Travel Demand Model have resulted in forecast travel volumes in Clackamas County in 2035 that are ***less than previous forecast travel volumes***. These revised forecasts, and the adoption of new performance standards, mean that the levels of projected congestion on Clackamas County roads and the number of Clackamas County intersections projected to fail in the next 20 years has ***decreased***.

This memo reviews what the changes are and the impact they have had on the travel demand forecast.

Clackamas County is updating its Transportation System Plan (Comprehensive Plan Chapter 5). As part of this work Clackamas County conducted extensive analysis of the arterial and collector road system in the County using information from Metro's Regional Travel Demand Model and other transportation data sources.

During this multi-year TSP update process, Metro's Regional Travel Demand Model has been updated and revised, resulting in changes in forecast traffic volumes on the regional arterial and collector road system.

The major changes are listed below, followed by more detailed descriptions of each.

A. Changes in land use assumptions, which result in changes to forecast vehicle trips
    a. Distribution and number of households
    b. Distribution and amount of employment
    c. Economic composition of households
B. More detailed analysis of travel, based on increased Travel Analysis Zones (TAZs),
C. Changes in travel model trip assignments
D. Changes in total amount of employment in Clackamas County

There are three levels of modeling that have been applied during this process:

1. **Beta Forecast**: Used in winter and spring 2012 for existing and future conditions modeling for 2010 and 2035 low-build and full-build scenarios with 2-hour PM peak forecasts
2. **Gamma Forecast/2-hour PM peak**: Used in summer 2013 for Tier 1 scenario modeling for 2035 (including the projects on the draft 20-Year Capital Project List) with 2-hour PM peak forecast
3. **Gamma Forecast/1-hour PM peak:** Will be used for the next round of RTP updates in 2014with 1-hour PM peak forecast and a peak spreading algorithm

The County conducted its first round of analysis using the 2010 and 2035 Beta forecasts. This analysis identified that 44 intersections out of the 125 studied would fail to meet performance standards in 2035. When the Tier 1 Scenario was analyzed using the Gamma forecast, only five intersections were identified as failing to meet the performance standards in 2035.

Clackamas County Transportation staff and Metro Travel Modeling staff have identified the following changes between the travel models.

A. Changes in 2035 Land Use Assumptions – Households and Employment

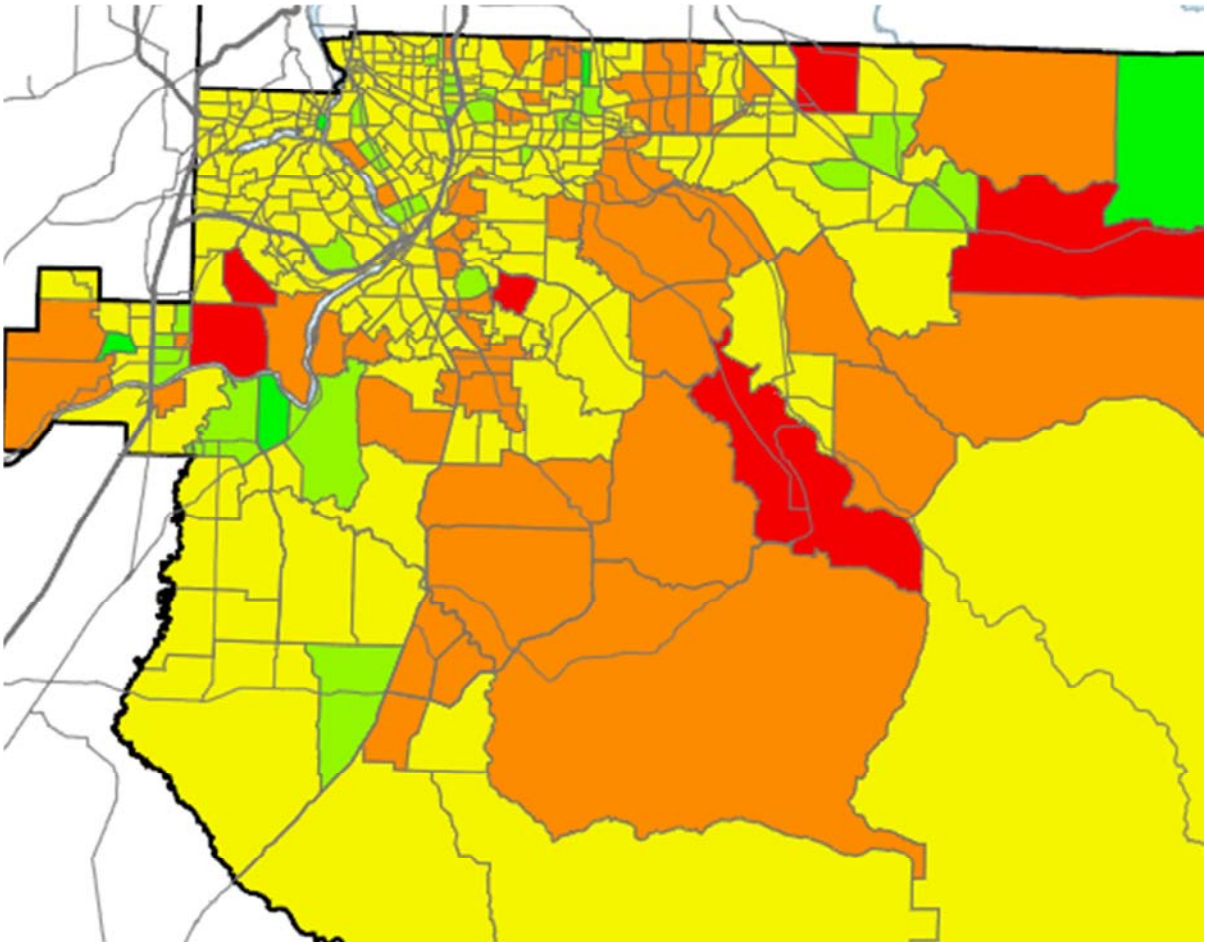
- The 2035 Gamma forecast has approximately 8,000 fewer households in Clackamas County than the 2035 Beta forecast. The final Transportation Analysis Zone (TAZ) allocations used in Metro's travel demand modeling tools for the two model runs being compared are shown below.

Total Households	2035 Beta	2035 Gamma	# Diff	% Diff
4-County* Total	1,197,568	1,168,967	-28,601	-2.4%
Clackamas County	***216,602***	***208,433***	***-8,169***	***-3.8%***

Total Employment	2035 Beta	2035 Gamma	# Diff	% Diff
4-County* Total	1,439,285	1,412,606	-26,679	-1.9%
Clackamas County	***205,960***	***210,444***	***+4,484***	***+2.2%***

The four counties are Clackamas, Clark, Multnomah and Washington.

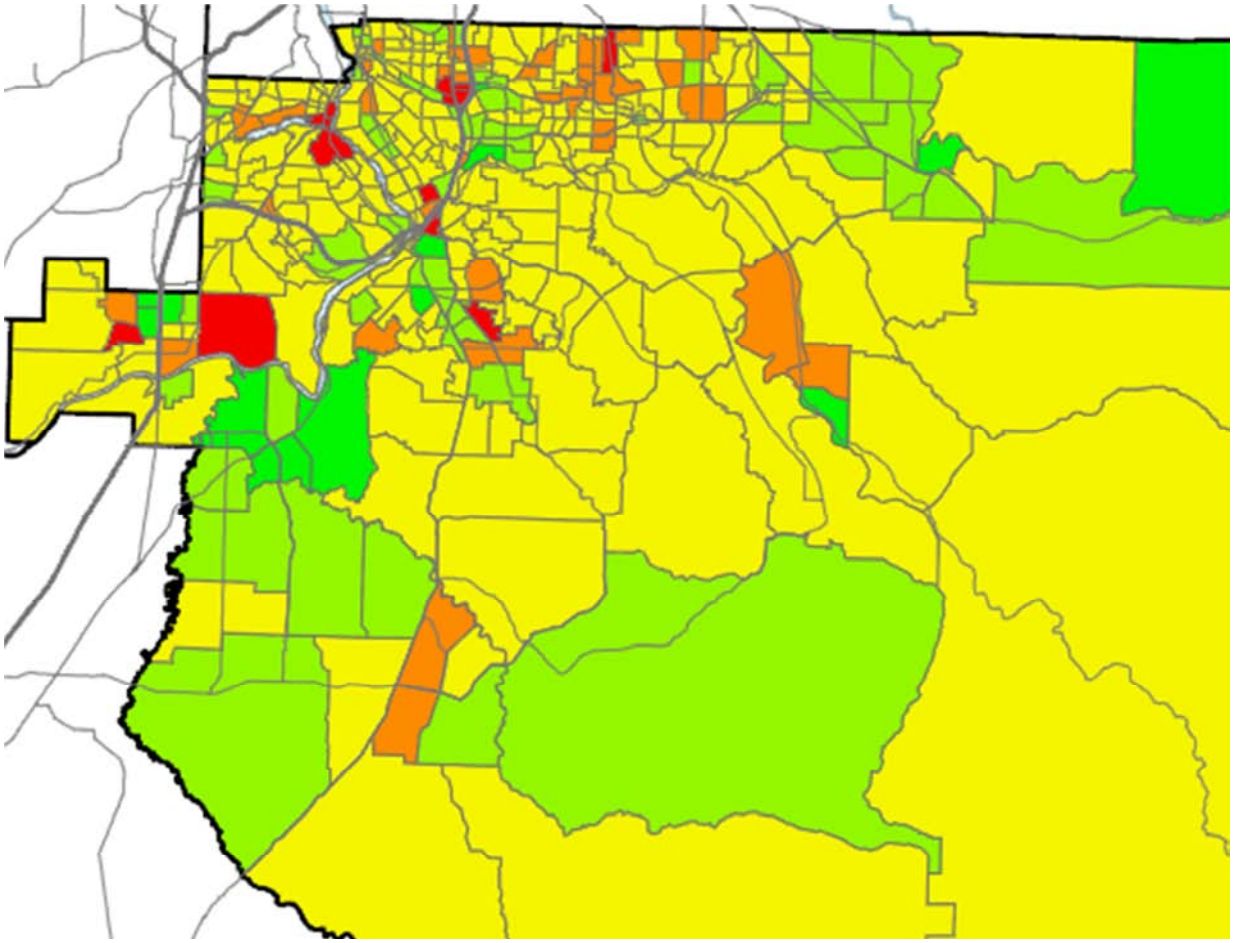
Households were redistributed within Clackamas County as shown in the map below. Red and orange indicate zones with fewer households in the Gamma forecast; green shows which zones had gains in the total number of households.



The different distribution of households results in local variations in the number of trips generated. This distribution can be described in the following terms:

- The Damascus and Estacada areas have fewer households.
- The Canby, Molalla and Sandy areas have more households.

Employment was also redistributed and increased slightly. Again, the red and orange indicate zones with less employment in the Gamma forecast while green shows the zones with gains.



There is a countywide change in the economic composition of the households between the two models, which affects the number of trips generated in the County.

- There is a general decrease in household income levels across the County, which may be related to large numbers of households with residents who are or soon will be retiring. Lower household incomes are strongly associated with reduced access to automobiles and increased demand for transit services.
- The make-up of the households in Clackamas County was changed as a result of the 2010 Census. Between the Beta and Gamma allocations, the shares of larger and higher income households were reduced somewhat, and the shares of smaller and lower income households were increased. The

percentage changes may not be large, but they are definitely contributing factors. In Metro's model, lower income households make fewer trips, own fewer cars, and are more sensitive to travel costs than higher income households.

Below are the daily trips generated by households in the travel demand model given the land use allocations:

Total Trips Produced	**2035 Beta**	**2035 Gamma**	**# Diff**	**% Diff**
4-County Total	12,330,500	11,425,400	-905,100	-7.3%
Clackamas County	***2,302,700***	***2,076,300***	***-226,400***	***-9.8%***

Total Work Trips Produced	**2035 Beta**	**2035 Gamma**	**# Diff**	**% Diff**
4-County Total	2,143,300	1,978,700	-164,600	-7.7%
Clackamas County	***426,500***	***380,300***	***-46,200***	***-10.8%***

- As a result of these changes in the 2035 land use and economic assumptions, **the total number of vehicles trips in 2035 decreased by 10%** between the Beta forecast and the Gamma forecast.

B. Changes to the Travel Model

A key component of a travel model is the Origin-Destination (O-D) Matrix which allocates all of the trips generated in a Traffic Analysis Zone (TAZ) to all of the other TAZs in the Regional Travel Model. This allocation is based on the results of a detailed travel survey of a large number of people living in the region.

- There are currently 2,162 TAZs in the Travel Demand Model.
- The old travel survey conducted in 1994 showed that 93% of all trips in Clackamas County were made by automobile. This survey data was used by the Beta model in the initial phase of the TSP update travel analysis.
- The new travel survey conducted in 2011 showed that 87.6% of all trips in the region were made by automobile. This survey data was used by the Gamma model in the Preferred Alternative travel analysis.

The following table shows how mode shares changed between 1994 and 2011 for all households.:

Mode Share by Area of Residence, 1994 vs. 2011 (source: *Metro Household Travel Survey*)

	1994	2011	1994	2011
	Region	**Region**	**Clackamas**	**Clackamas**
Single-Occupancy Vehicle (SOV)	43.4%	42.5%	46.2%	45.1%
High-Occupancy Vehicle (HOV)	43.9%	41.2%	47.0%	42.5%
Total Auto	*87.3%*	*83.8%*	*93.2%*	*87.6%*
Transit	2.9%	4.2%	1.1%	2.9%
Walk	8.7%	9.2%	5.2%	8.2%
Bike	1.1%	2.8%	0.4%	1.3%

- The survey shows that Clackamas County continues to have a higher proportion of auto trips than the 4-county region as a whole (93.2% vs. 87.3% and 87.6% vs. 83.8%). However, there were significant increases in non-auto modes between 1994 and 2011 which resulted in **an additional 5% reduction in the overall number of trips made by automobile in 2035.**
- The combined effect of these two changes to the travel model is a 15% reduction in the number of trips made by automobiles and a resulting decrease in the travel volumes shown by the model in 2035.
- The above analysis indicates that there are a number of factors contributing to the reduction of trips region-wide and in Clackamas County – fewer households, change in household composition and recalibrated mode shares. While these may not be the entire story, they explain a large amount of the differences in projected 2035 traffic volumes.

Additional Travel Model Issues

C. Travel Model Trip Assignments

- The 15% decrease in trips is based on the total daily trips.
- The model makes its forecast for the PM peak hour, which has a higher percentage of the total trips occurring by transit.
- The result of this difference is an additional reduction in auto trips of approximately 3%, which increases the total reduction of in automobile PM peak hour trips to 18%.

D. Employment Changes

- The total employment in Clackamas County increased by a few thousand jobs between the Beta forecast and the Gamma forecast.
- The change may produce shorter journey-to-work trips as people in Clackamas County households have more opportunities to be employed within the county.

The combined effect of these four factors is estimated to reduce the number of automobile trips by at least 18% from the model estimate developed as part of the TSP low-build model in the *Existing and Future Conditions Analysis*.

Model Trip Reduction and New Traffic Operations Performance Standards

- The Oregon Highway Plan (OHP) and the Regional Transportation Functional Plan (RTFP) require that the County adopt new traffic operation performance standards using a volume-to-capacity (v/c) measure.
- The combination of new performance standards and reduced travel volumes estimated by the travel model will substantially reduce the number of intersections that fail to meet the performance standards.
- **The effect of these changes is not going to solve future traffic capacity problems, but will potentially push out the time at which the problems / failures are projected to occur beyond the 20-year planning horizon.**

APPENDIX 1: Summary of Network and Model Enhancements since the last RTP Update

prepared by Metro staff, July 2013

Network Updates

- The Transportation Analysis Zone (TAZ) system was significantly modified (from 2,013 to 2,162 TAZs). The new zones are better aligned with current tax lot boundaries.
- The base year was updated from 2005 to 2010.

Updated Inputs

- 2040 design types updated to include more tiers based on findings from State of the Centers report and Transit-Oriented Development strategic plan reflecting that not all Centers and Station communities are in the same stage of development.
    - Regional Centers – from 1 to 2 tiers
    - State Communities – from 1 to 3 tiers
    - Town Centers – from 2 to 4 tiers
    - Corridors – NW 23rd adjusted to reflect high parking restrictions compared to other Corridors.
- Updated TAZ assumptions based on 2040 design types to allow for more control over policies being tested. Main Street, Corridor, Inner neighborhood all used to be in one classification. By splitting them, you can test parking policy on just corridors.
    - Parking factors – coordinated with City of Portland to reach agreement. Central City parking costs have been increasing at different rates in different parts of the city. Agreement reached to use a consistent value in the future.
    - Intersection densities recalculated to reflect new zone system
    - Transit pass factors updated to 2010$

Model Enhancements

- The last RTP update used the Ivan model.
- The East Metro Connections Plan used Joan model (version 1.0)
- The 2014 RTP update will use the Joan model (version 2.0), which was used by other planning efforts such as the SW Corridor Plan, Active Transportation Plan, and several recent TSPs.
    - Enhancements included in Joan Version 2.0 include:
        - Transit time perception
            - Wait time perception varies depending on stop type: pole, basic shelter, enhanced shelter/transit center
            - In-vehicle time perception varies depending on vehicle types: bus, street car, light rail
        - Park & Ride Lot Choice
            - A traveler considering using the park-ride mode is now given the opportunity to consider multiple lots locations. Prior, only one lot choice was offered.
        - Validation to the Portland/Vancouver Region Travel Behavior Survey

- The model was modified as necessary to make sure that parameters were effective in producing model results that reflected today's conditions. New regional mode shares will be reflected in new model to reflect change from 1997 to 2011 surveys: decrease in auto (87.3 to 83.7), increase in biking, walking and transit (12.7 to 16.2) (these numbers include travel to/from Clark County.

- Bike model
  - Formerly the regional model only factored trip distance into the decision to bike as well as some socioeconomic/demographic factors. The new model calculates a travel utility between zone pairs, and includes all streets. Bike lanes, boulevards, trails, etc. are flagged as more attractive than other routes. Consideration is given to the volume of auto traffic, number of stop signs/signals along route, number of left turns, slope, other network attributes.
  - The bike model assigns bike trips to the network, illustrating volume flows, identifies origins and destinations of users traveling along a given segment of the network, calculates bike miles traveled.
  - The tool is unique compared to most other regions because the bike mode competes with the other modes with regard to the attractiveness to the traveler. As the utility rises and the bike mode becomes more attractive, trips on other modes switch to bikes based upon the degree of change in the attractiveness.
- Peak-spreading algorithm
  - The treatment in the peak hour has been updated to better match count and survey data, providing a more realistic treatment of how travelers response to the peak period congestion
  - Captures the shoulder hour impacts as excess demand in peak periods is moved to adjacent hours
  - Permits inspections of performance on an hourly basis, e.g. 4:00-5:00, 5:00-6;00, 6:00-7:00
  - The algorithm does not impact the base year (2010) significantly. It is much more important in the future years in routes where demand far exceeds network capacity in the peak hours (volume / capacity > 1.0).
  - The algorithm uses today's 'most congested' corridors as a proxy for a future year congestion threshold. Future year demand is spread when congestion along corridors exceeds this threshold.
- Costs updated from 1994 dollars to 2010 dollars
- Airport demand model has been implemented
- Truck flows updated to reflect most recent land use forecast (Gamma)

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

70% Household and Employment Growth Scenario – Findings

Date: February 11, 2013

Project #: 11732

To: TSP Public Advisory Committee

From: TSP Project Management Team

Project: Clackamas County Transportation System Plan Update

Subject: 70% Household and Employment Growth Projection Scenario Findings

INTRODUCTION

Some Public Advisory Committee (PAC) members have expressed skepticism as to the accuracy of the most recent 2035 Metro Household and Employment Forecast based on their variety of views on future economic growth, energy supply and global warming, and concerns about regional forecasting methodologies and assumptions.

The most recent 2035 forecast, called the *2035 Gamma Forecast*, which was adopted by the Metro Council in December 2012, is shown in the following table:

Table 1 2035 Gamma Forecast Findings

2035 Gamma Forecast	2010 Households	2035 Households	2010 – 2035 Change	2010 Employment	2035 Employment	2010 – 2035 Change
Clackamas County	146,324	205,369	+59,045	137,946	210,340	+72,394
Multnomah County	304,649	442,778	+138,129	419,164	597,532	+178,368
Washington County	202,647	294,174	+93,527	232,019	382,310	+150,291
Clark County	158,110	228,392	+70,282	127,267	222,029	+94,762
TOTAL	**811,730**	**1,170,713**	**+358,983**	**916,396**	**1,412,211**	**+495,815**

Under this forecast, Clackamas County is expected to see a County-wide increase of 59,045 households and 72,394 jobs between 2010 and 2035. This is the smallest percentage of growth in the four metropolitan counties.

ALTERNATIVE FORECAST ASSUMPTIONS

The PAC discussed a number of alternative growth scenarios before reaching a consensus to recommend that the staff review a scenario that reflects 70% of the growth projected in the Metro Gamma Forecast.

The PAC agreed not to recommend a no-growth scenario because of the major changes that would be required in regional forecasting assumptions, including the following:

- Natural growth, the amount the regional birth exceeding regional deaths, has historically accounted for 30% to 50% of the region's growth. Zero population growth would assume an equal number of births and deaths, which has never been the case in this County.
- Net migration, the difference between the number of people moving into the region and out of the region, has typically been a positive numbers, i.e., more people have moved into the region than out of the region. While it is possible to have a net regional outmigration under certain circumstance, it is unlikely that this would occur with a large enough difference to offset natural growth over the next 20-plus years.

The question is whether all of the projects that were previously identified as needed based on 100% of the Metro Gamma Forecast will still be needed if that growth comes in at a lower level.

RECOMMENDED PROJECT SCORING

The results of the 70% growth scenario and capacity project assessment will be integrated into the project prioritization process. In addition to the goal scores assigned to each project, scores will be given for several other considerations, including whether projects address a capacity deficiency under the 70% growth scenario.

The following scores related to the 70% growth scenario are recommended:

- Projects that address a deficient facility under the 70% growth analysis will be given a score of **+1**. This includes **29** capacity projects and **12** upgrade projects. These projects are shown on the maps in Figure 1.
- Projects that do not address a deficient facility under the 70% growth analysis will be given a **-1**. This includes **22** capacity projects and **71** upgrade projects. These projects are shown on the maps in Figure 2.
- All other projects will receive a score of 0 (i.e., capacity projects on facilities that were not studied, active transportation projects, safety projects).

The remainder of this memo reports the findings of the 70% growth scenario assessment and discusses related implications for vehicle capacity and upgrade projects on the Transportation System Plan (TSP) Master Project List.

70% GROWTH PROJECTION SCENARIO ANALYSIS

As part of the *Existing and Future Conditions Report* for the TSP, Kittleson (KAI) assessed the existing transportation conditions in Clackamas County and the projected 2035 conditions under two scenarios:

- The 2035 Low Build Scenario provides an understanding of how the future transportation system would operate if projected population and employment growth occurred, but the only transportation projects constructed were those currently funded for construction over the next several years.
- The 2035 Full Build Scenario has the same population and employment projections as the Low Build Scenario, but provides an understanding of how the future transportation system would operate if all of the projects identified in the County's current TSP were constructed, even those without funding at this time.

The future conditions scenarios were based on the County's projected population and land use for the year 2035 (the horizon year for the Metro Regional Transportation Plan [RTP] that applies to portions of the county within the Metro Urban Growth Boundary [UGB]). The metro travel demand model was used to develop future traffic volumes for both scenarios.

In order to assess the transportation conditions and needs if less growth than anticipated occurs, the transportation system was reassessed with 70% of the growth forecasted for the 2035 Low Build Scenario. This analysis serves as a sensitivity test of capacity projects to determine which projects may not be warranted if growth occurs more slowly than projected or if the use of vehicular transportation decreases significantly (i.e. due to higher fuel prices or more alternative transportation options). For reference, figures showing the Low Build roadway and intersection performance are provided in ***Appendix A***. The findings of the 70% growth analysis are detailed below.

INTERSECTION OPERATIONS

KAI reassessed operations at the study intersections that are not projected to meet operational standards under the 2035 Low Build Scenario, assuming 70% of the forecasted growth. The detailed results by geographic sub area are included in ***Appendix B*****.**

Twelve of the 43 intersections that did not meet operational standards under the 2035 Low Build Scenario do meet standards with 70% of the forecasted growth. These intersections are shown in Table 1. The remaining 31 intersections do not meet operational standards with 70% of the anticipated growth.

Table 2 Intersections Meeting Operational Standards Under 70% Growth Projection

ID	Intersection	Geographic Sub Area	Jurisdiction	Performance Std (LOS or v/c)**	Performance Under:	
					Low Build	70% Growth Scenario
105	SE Johnson Creek Boulevard/82nd Avenue	CRCIA	ODOT	0.99	>1.0	0.98
116	SE King Road/SE Fuller Road	CRCIA	County	0.99	>1.0	0.98
131	SE Sunnyside Road/I-205 NB Ramps	CRCIA	ODOT	0.85*	0.88	0.79
136	SE Sunnybrook Boulevard/SE 82nd Avenue	CRCIA	ODOT	1.1	>1.0	0.67
138	SE Sunnybrook Boulevard/I-205 NB Ramps	CRCIA	ODOT	0.85*	0.89	0.81

ID	Intersection	Geographic Sub Area	Jurisdiction	Performance Std (LOS or v/c)**	Performance Under:	
					Low Build	70% Growth Scenario
144	SE Sunnyside Road/SE 122nd Avenue	CRCIA	County	0.99	>1.0	0.96
146	SE Sunnyside Road/SE 142nd Avenue	CRCIA	County	0.99	>1.0	0.94
161	Highway 212/SE 172nd Avenue	CRCIA	ODOT	0.99	>1.0	0.97
224	SE Jennings Avenue/SE Webster Road	McLoughlin	County	0.99	1.00	0.92
302	SW Borland Road/SW Stafford Road	Northwest	County	D	E	C
303	SW Mountain Road/SW Stafford Road	Northwest	County	D	F	D
304	SW Ellingson Road/SW 65th Avenue	Northwest	County	D	E	D

* ODOT Interchange Ramp Standard

** Performance standards -- level of service (LOS) or volume to capacity ratio (v/c)

ROADWAY OPERATIONS

KAI reassessed congestion on roadway segments in the County assuming 70% of projected growth occurs. Congested roadways are defined as those with volume-to-capacity (v/c) ratios over 1.0. The results showed that the majority of roadway segments that are very congested (v/c ratio over 1.1) under the Low Build scenario are still congested (1.0 < v/c < 1.1) under the 70% growth scenario.

However, approximately 20 roadway segments considered congested under the Low Build scenario are no longer congested (v/c <1.0) with 70% of projected growth, including some roadways with multiple segments that are no longer congested:

- Portions of OR 224 in East County;
- OR 99E in the Southwest geographic study area;
- Webster Road in the Greater McLoughlin Area;
- Aldercrest Road in the Greater McLoughlin Area;
- Portions of SE Sunnyside Road in the Clackamas Regional Center/Industrial Area;
- Portions of I-205 in the Clackamas Regional Center/Industrial Area;
- SE Idleman Rd in the Clackamas Regional Center/Industrial Area;
- SE Clatsop St in the Clackamas Regional Center/Industrial Area;
- Portions of OR 212/OR 224 in the Clackamas Regional Center/Industrial Area;
- SE Tong Rd in the Clackamas Regional Center/Industrial Area;
- SE Evelyn St in the Clackamas Regional Center/Industrial Area; and
- SW Wilsonville Rd in the Northwest geographic study area.

For reference, maps are provided in *Appendix C* that compare the roadway segments that were found to be congested under the 2035 Low Build Scenario with those considered congested with 70% of

projected growth. Maps showing the level of congestion on all roadway segments (including those that are not congested) under the 70% growth scenario are provided in *Appendix C* as well.

VEHICLE CAPACITY PROJECTS

In order to assess the projects on the Master List potentially affected by the 70% growth projection scenario, KAI isolated the projects that are categorized as vehicle capacity projects. As discussed in the *Prioritization Process Memo*, the vehicle capacity projects are defined as:

- **Urban Upgrade: Vehicle Capacity Only** – Projects within the UGB that add vehicle capacity to an existing roadway or intersection (and require the reconstruction of any existing sidewalks and/or bicycle lanes).
- **Rural Upgrade: Vehicle Capacity Only** – Projects outside of the UGB that add vehicle capacity to an existing roadway or intersection. Examples include adding intersection turn lanes or installing a traffic signal (and requiring the reconstruction of existing paved shoulders, sidewalks and/or bicycle lanes).

Vehicle capacity projects therefore include both intersection and roadway projects directly focused on providing additional room for vehicles. The Master List included 70 vehicle capacity projects at the time of this analysis. The necessity of the projects is based on projected capacity deficiencies in the transportation system in 2035.

The Master List projects categorized as "urban upgrade – vehicle capacity" or "rural upgrade – vehicle capacity" were mapped along with the congested roadway segments and failing intersections under the 70% growth scenario. These maps were used to identify which projects address deficiencies under the 70% growth scenario. The maps are provided in *Appendix D* for reference. A table of the projects is also provided in *Appendix D.* The column "Identified Capacity Deficiency Under 70% Growth?" notes if the 70% growth scenario analysis identified a capacity deficiency at the intersection or roadway.

The list is divided in to three groups (indicated by the cell colors) based on this column:

- **Yes (indicated in blue)** – These projects do address a capacity deficiency in the 70% growth scenario, as identified in the *Existing and Future Conditions Report* and additional analysis. There are **29 projects** in this group.
- **No (indicated in purple**) – These projects do not address an identified capacity deficiency in the 70% growth scenario, meaning analysis performed for the TSP suggests that the intersection or roadway is performing at or above standards (for intersections) or below capacity (for roadways). There are **22 projects** in this group.
- **Not Studied (indicated in green)** – These projects address intersections or roadways that were not studied as part of the TSP analysis. There are **19 projects** in this group.

The "Notes" column in the table includes relevant information about the project to consider, such as the project provides a safety benefit or is being further assessed in the Dynamic Traffic Assignment (DTA) analysis currently being performed. The "Comments" column includes feedback received from the Technical Advisory Committee (TAC), Geographic Area Projects (GAPS) groups, Virtual Open House (VOH), Public Advisory Committee (PAC), or Pedestrian and Bicycle Action Committee (PBAC).

UPGRADE PROJECTS

In addition to the projects discussed above that are primarily focused on enhancing vehicle capacity, there are a number of projects in the Master List categorized as "Rural Upgrade" or "Urban Upgrade." These projects typically include a vehicle capacity element and active transportation facilities (i.e., bike lane or shoulders) or a safety element (i.e., removal of horizontal curvature).

- For some of the projects, the capacity element may be a small portion of the project (i.e., project includes bikeways, pedways, traffic calming, and turn lanes at intersection).
- For other projects, the capacity element may be the focus of the project (i.e., widen to 5 lanes with bikeways and pedways).
- Some of the upgrade projects bring roadways up to standards without adding capacity, and were thus not evaluated as part of this analysis.

There were 83 upgrade projects with capacity elements assessed in this analysis.

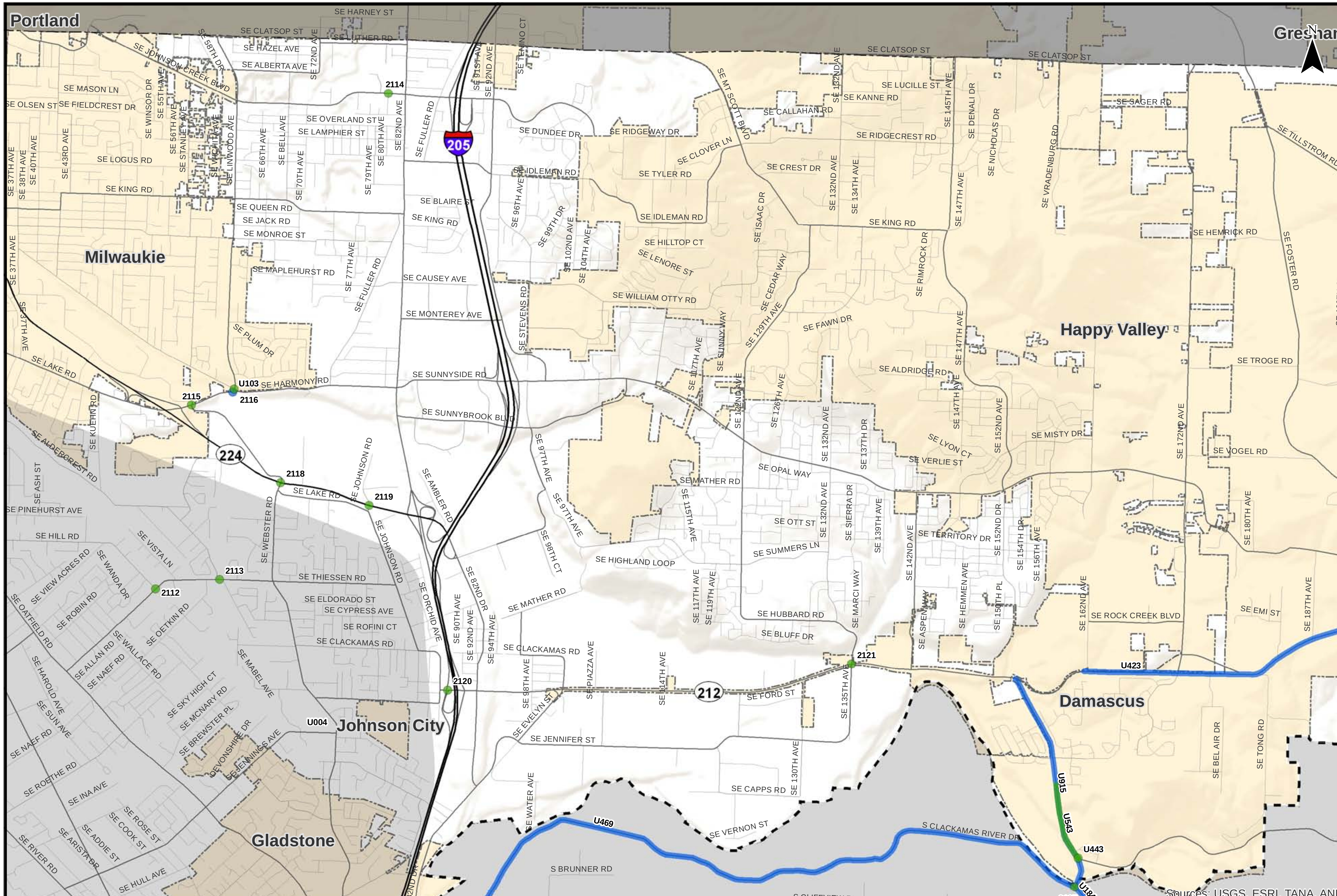
As done for the vehicle capacity projects, these projects were more closely compared to the intersection and roadway deficiencies under the 70% growth scenario. Maps showing the upgrade projects and deficiencies were used to assess whether upgrade projects address a deficiency. These maps, as well as a table of the upgrade projects, are provided in *Appendix E.* In the table, the column "Identified Capacity Deficiency Under 70% Growth?" notes if the 70% growth scenario analysis identified a capacity deficiency at the intersection or roadway. The list is divided in to two groups (indicated by the cell colors) based on this column:

- **Yes (indicated in blue**) – These projects do address a capacity deficiency in the 70% growth scenario, as identified in the *Existing and Future Conditions Report* and additional analysis. There are **12** projects in this group.
- **No (indicated in purple)** – These projects do not address an identified capacity deficiency in the 70% growth scenario, meaning analysis performed for the TSP suggests that the intersection or roadway is performing at or above standards (for intersections) or below capacity (for roadways). There are **71** projects in this group.

Again, the "Notes" column included in the table includes relevant information about the project to consider. As seen in the table, a large number of the projects determined not to be needed under the 70% growth scenario add turn lanes at intersections on a segment of roadway. While these roadways are not projected to be congested, turn lanes will provide operational and safety benefits.

CLACKAMAS COUNTY
TRANSPORTATION SYSTEM PLAN Update

- Capacity Project (point)
- Capacity Project (line)
- Upgrade Project (point)
- Upgrade Project (line)
- Incorporated Areas
- County Boundary
- UGB



0 1 Miles

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

Capacity and Upgrade Projects that Do Address a Deficiency in the 70% Growth Projection Scenario
Greater Clackamas Regional Center / Industrial Area

Figure
C 1

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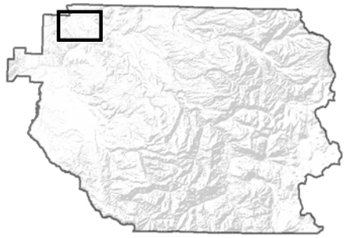
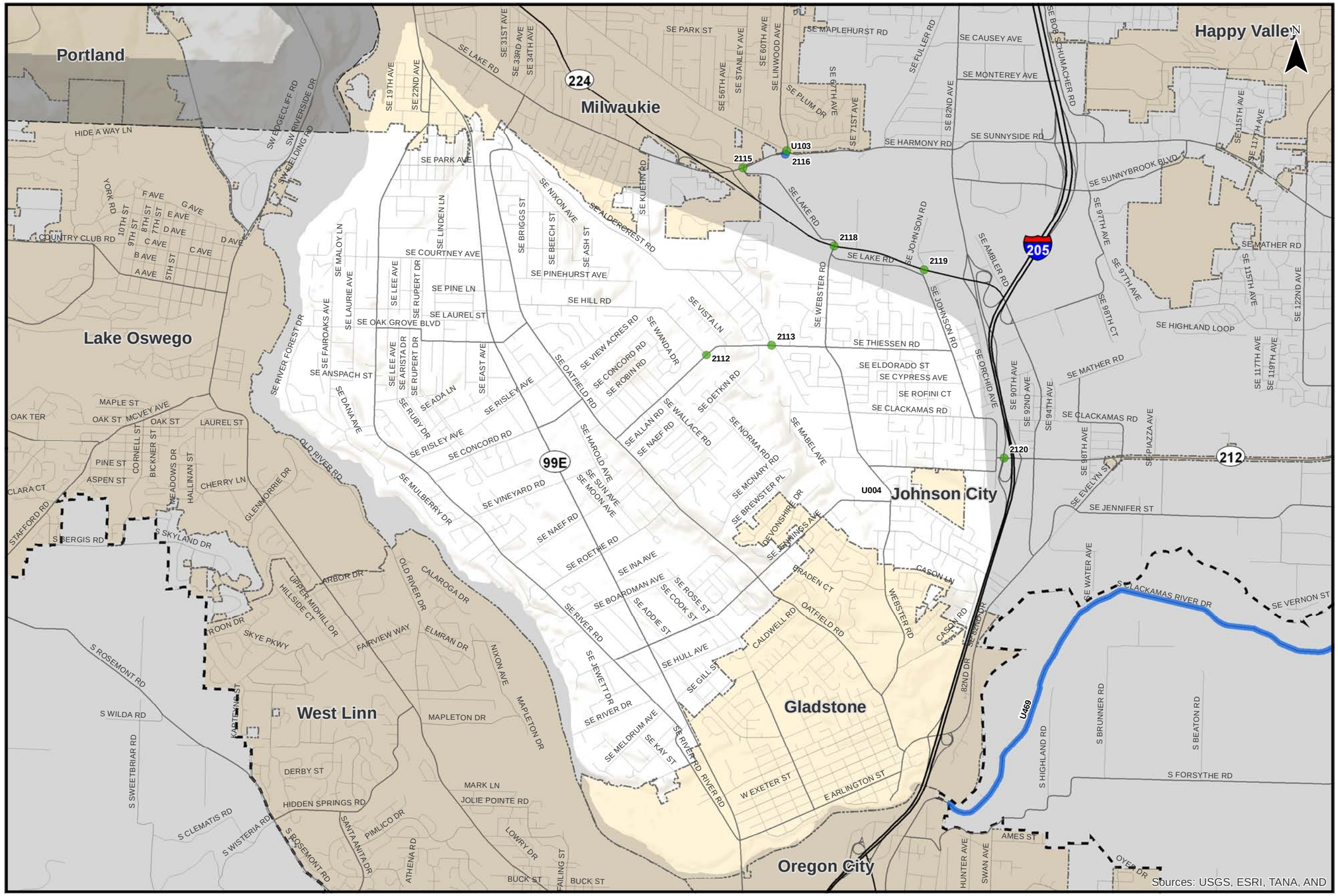
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*



- Capacity Project
- Capacity Project
- Upgrade Project
- Upgrade Project
- 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

Capacity and Upgrade Projects that Do Address a Deficiency in the 70% Growth Projection Scenario Greater McLoughlin Area

Figure
M 1

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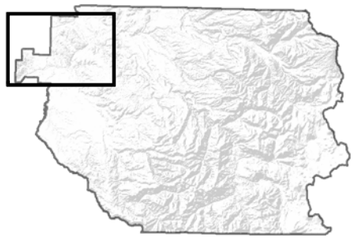
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*



- Capacity Project
- Capacity Project
- Upgrade Project
- Upgrade Project
- Incorporated Areas
- County Boundary
- UGB

0 1 2 Miles

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

Capacity and Upgrade Projects that Do Address a Deficiency in the 70% Growth Projection Scenario Northwest County

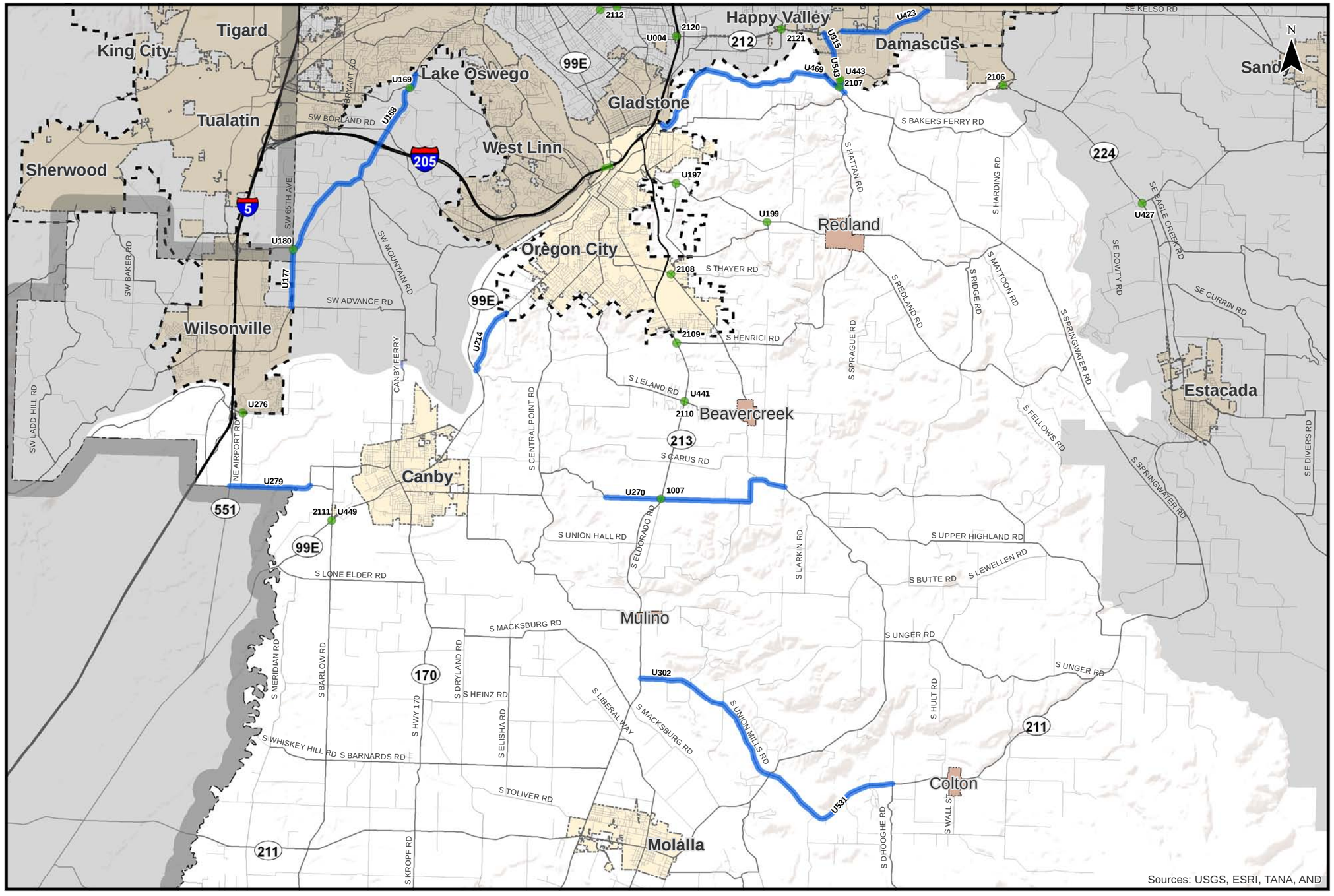
Figure
NW 1

Sources: USGS, ESRI, TANA, AND

H:\profile\11732 - Clackamas County TSP\70% Growth Scenario\Congested Roadways and Master Projects_Upgrade&Capacity_addDef.mxd

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*

- Capacity Project
- Capacity Project
- Upgrade Project
- Upgrade Project
- 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

Capacity and Upgrade Projects that Do Address a Deficiency in the 70% Growth Projection Scenario Southwest County - Northern Portion

Figure
SN 1

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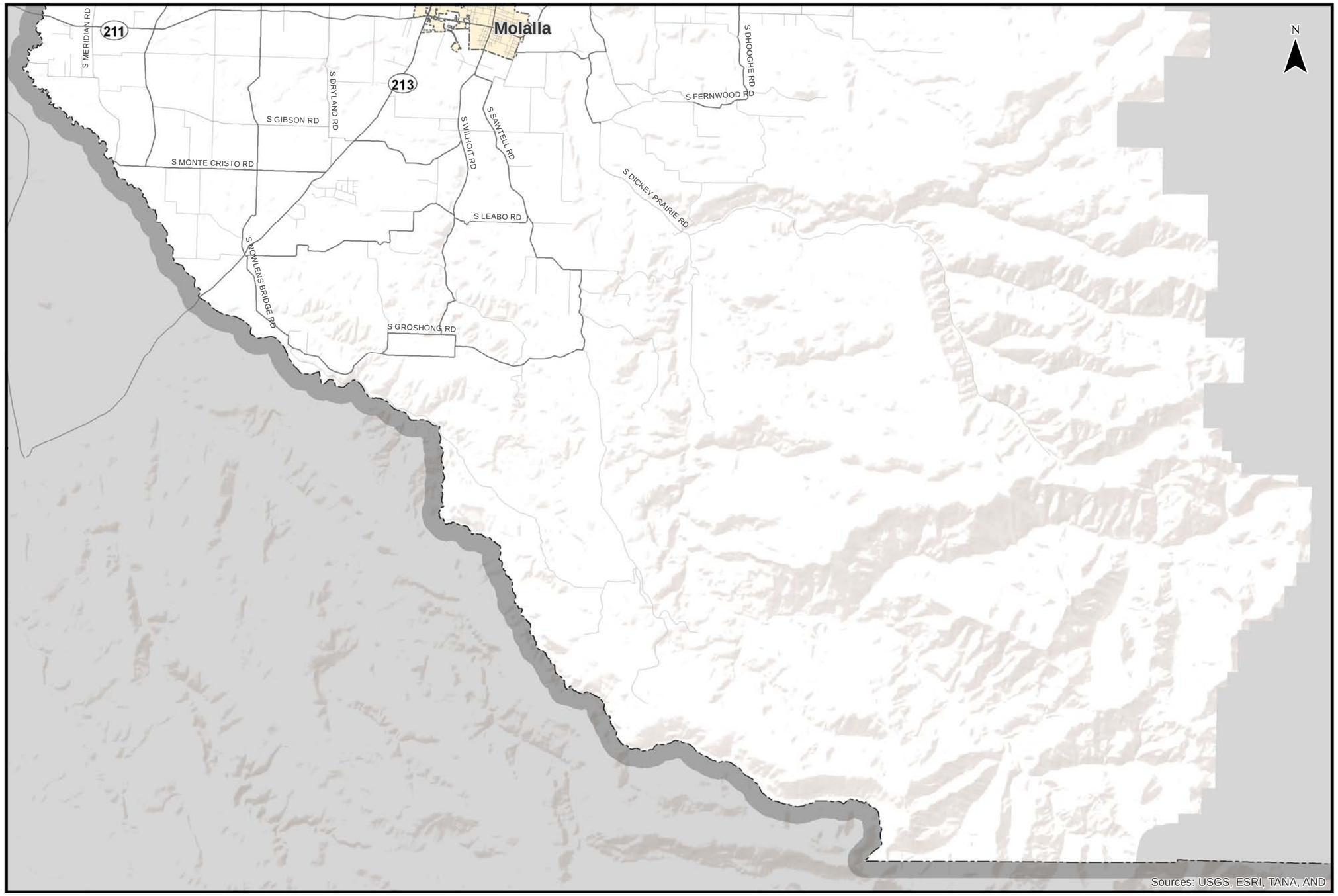
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

- Capacity Project
- Capacity Project
- Upgrade Project
- Upgrade Project
- 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

Capacity and Upgrade Projects that Do Address a Deficiency in the 70% Growth Projection Scenario Southwest County - Southern Portion

Figure
SS 1

H:\proj\file\11732 - Clackamas County TSP\70% Growth Scenario\Congested Roadways and Master Projects_Upgrade&Capacity_addDef.mxd

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

- Capacity Project
- Capacity Project
- Upgrade Project
- Upgrade Project
- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 5 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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Boring
Sandy
Estacada
Brightwood
Zig Zag
Welches
Rhododendron
Government Camp

2105
2106
U427

SE BLUFF RD
SE LUSTED RD
SE 282ND AVE
SE 242ND AVE
SE 352ND AVE
SE ORIENT DR
SE KELSO RD
SE 272ND DR
SE MARMOT RD
E MARMOT RD
SE COALMAN RD
E BARLOW TRAIL RD
E LOLO PASS RD
S HARDING RD
SE DOWTY RD
SE FIRWOOD RD
SE PAGH RD
SE MCCABE RD
SE CURRIN RD
SE GEORGE RD
SE DIVERS RD
S UNGER RD

26
224
211
35

N

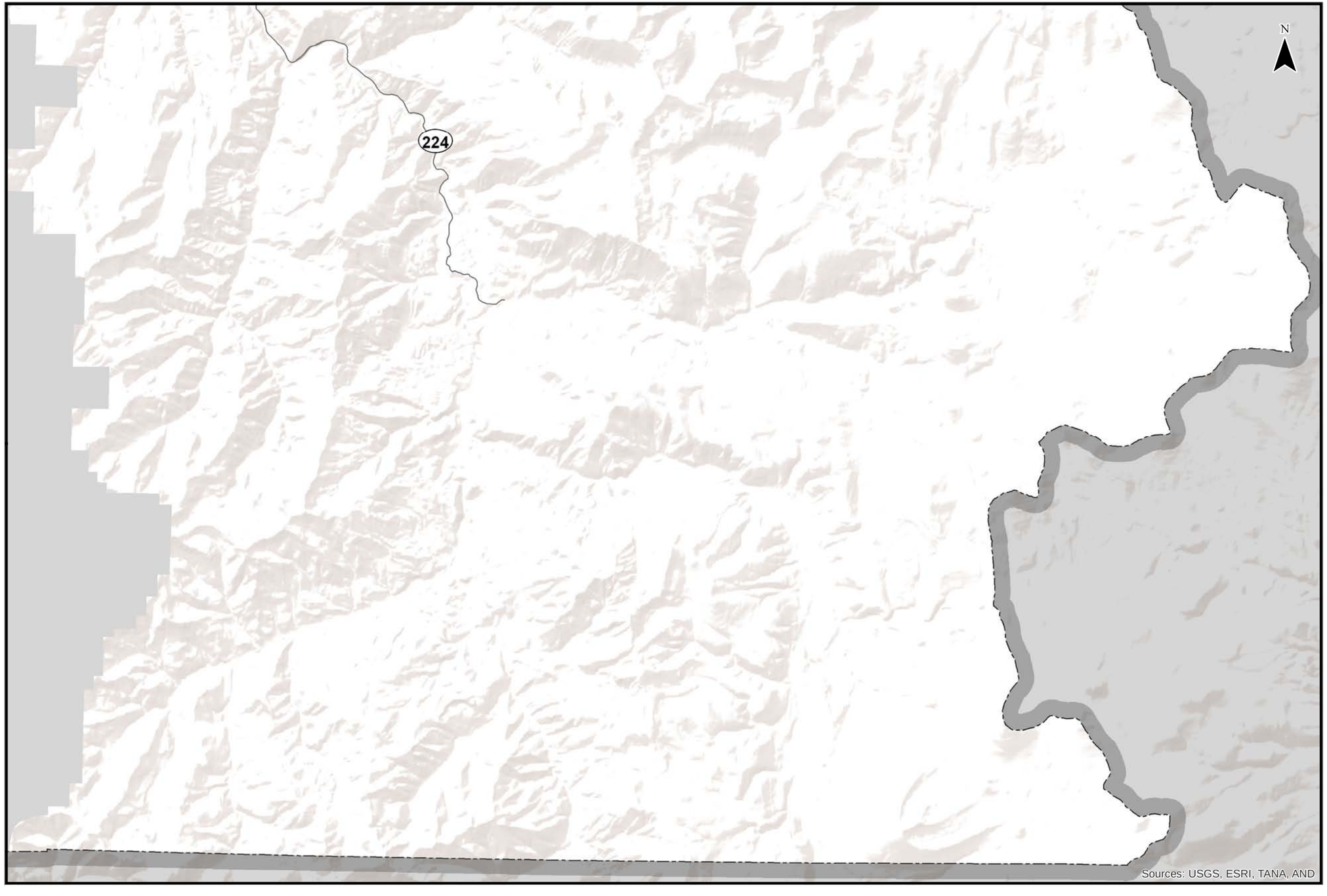
Sources: USGS, ESRI, TANA, AND

Capacity and Upgrade Projects that Do Address a Deficiency in the 70% Growth Projection Scenario East County - Northern Portion

Figure
EN 1

CLACKAMAS COUNTY
TRANSPORTATION SYSTEM PLAN *Update*

- Capacity Project
- Capacity Project
- Upgrade Project
- Upgrade Project
- 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

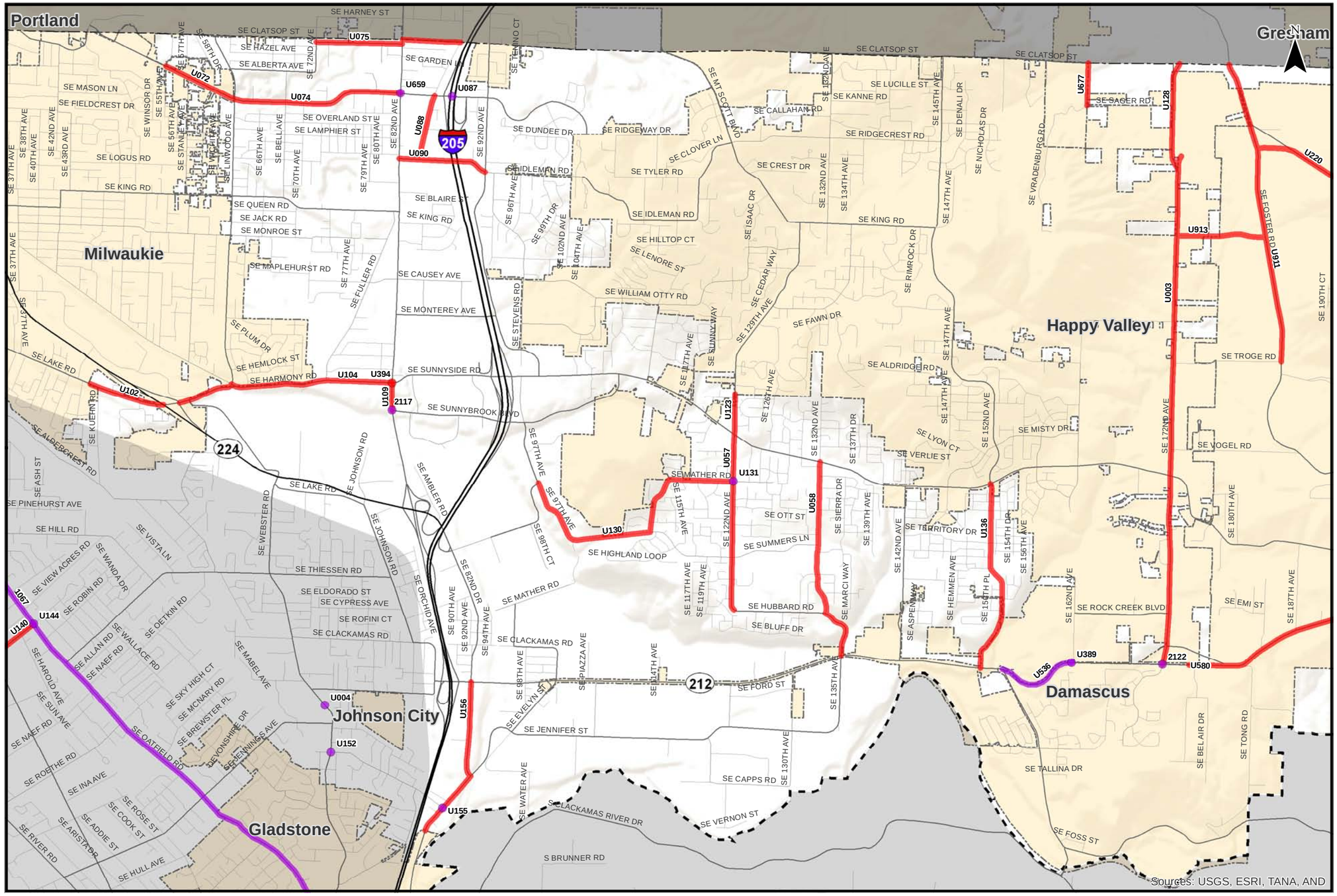
Capacity and Upgrade Projects that Do Address a Deficiency in the 70% Growth Projection Scenario
East County - Southern Portion

Figure
ES 1

H:\proj\file\11732 - Clackamas County TSP\70% Growth Scenario\Congested Roadways and Master Projects_Upgrade&Capacity_addDef.mxd

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

- Capacity Project
- Capacity Project
- Upgrade Project
- Upgrade Project
- Incorporated Areas
- County Boundary
- UGB



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

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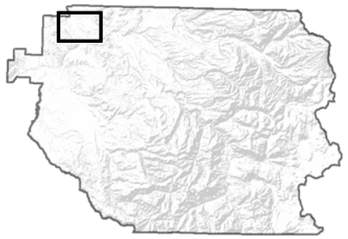
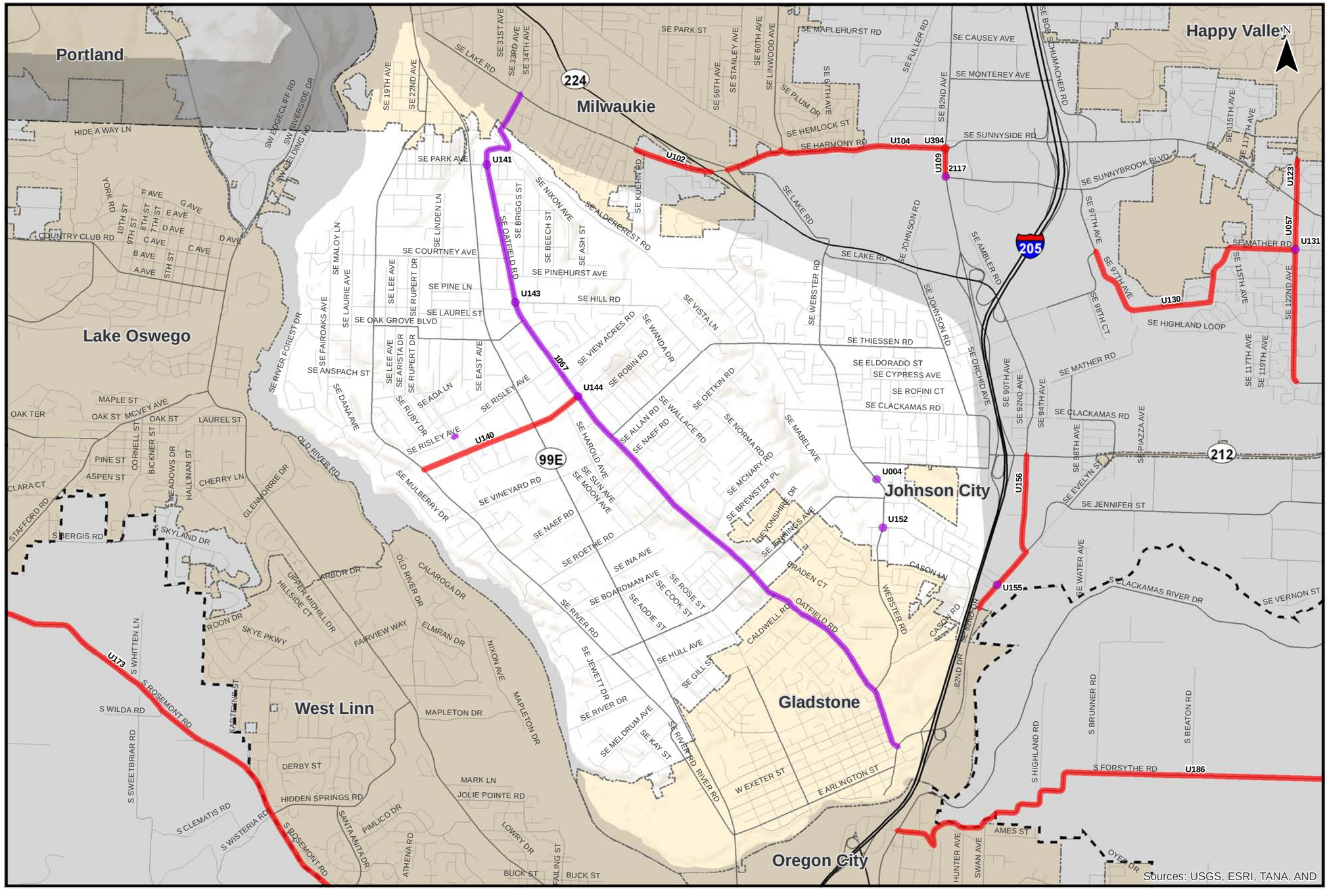
Capacity and Upgrade Projects that Do Not Address Deficiency in 70% Growth Projection Scenario
Greater Clackamas Regional Center / Industrial Area

Figure
C 2

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



- Capacity Project
- Capacity Project
- Upgrade Project
- Upgrade Project
- Incorporated Areas
- County Boundary
- UGB



0 1 Miles

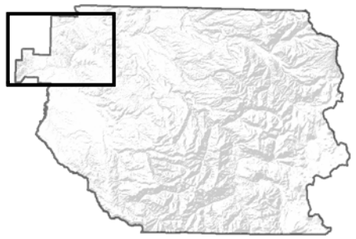
Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

Capacity and Upgrade Projects that Do Not Address Deficiency in 70% Growth Projection Scenario Greater McLoughlin Area

Figure
M 2

H:\profile\11732 - Clackamas County TSP\70% Growth Scenario\Congested Roadways and Master Projects_Upgrade&Capacity.mxd

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*



- Capacity Project
- Capacity Project
- Upgrade Project
- Upgrade Project
- Incorporated Areas
- County Boundary
- UGB

0 1 2 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\70% Growth Scenario\Congested Roadways and Master Projects_Upgrade&Capacity.mxd

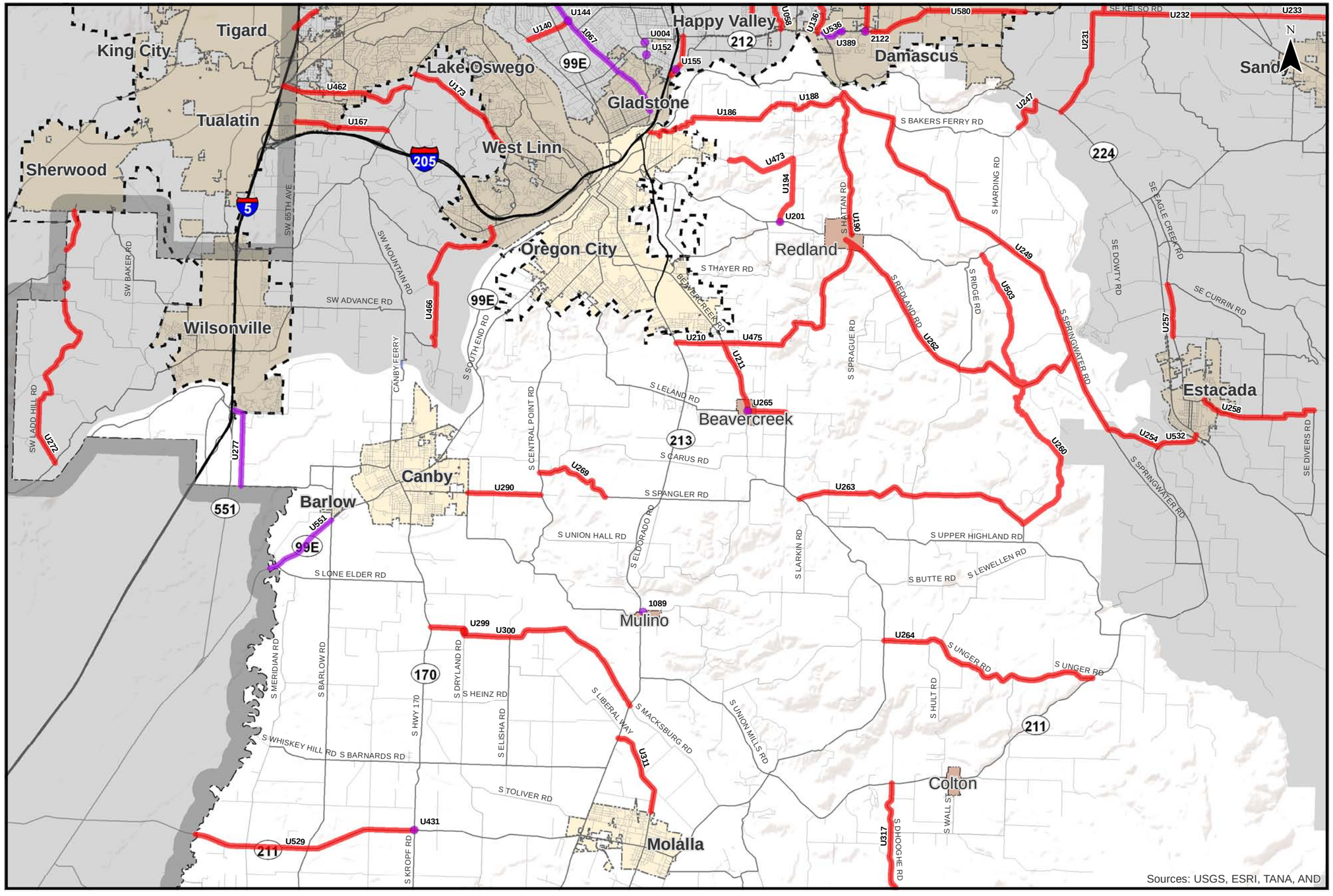
Capacity and Upgrade Projects that Do Not Address Deficiency in 70% Growth Projection Scenario Northwest County

Figure
NW 2

Sources: USGS, ESRI, TANA, AND

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

- Capacity Project
- Capacity Project
- Upgrade Project
- Upgrade Project
- 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

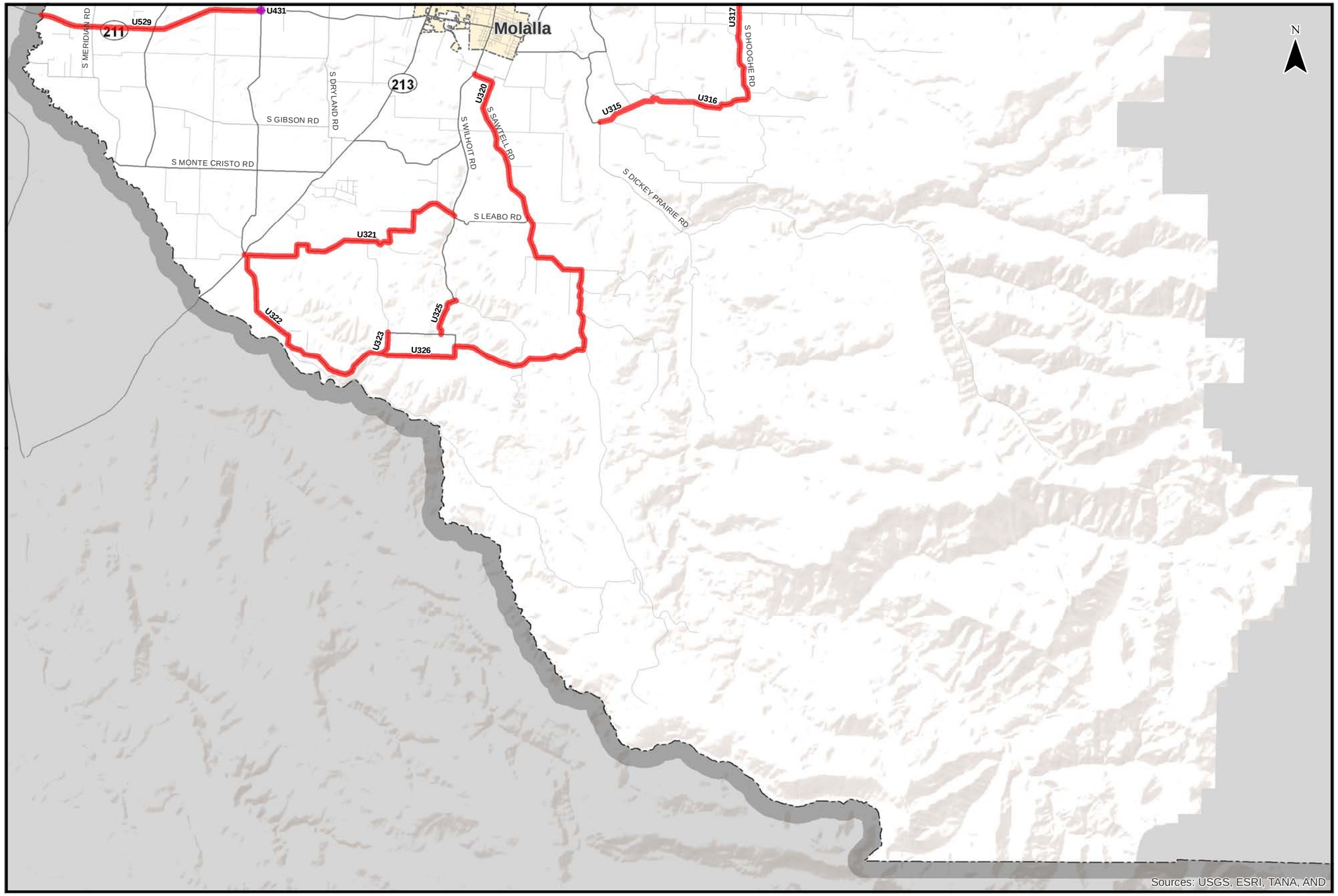
Capacity and Upgrade Projects that Do Not Address Deficiency in 70% Growth Projection Scenario
Southwest County - Northern Portion

Figure
SN 2

H:\proj\file\11732 - Clackamas County TSP\70% Growth Scenario\Congested Roadways and Master Projects_Upgrade&Capacity.mxd

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*

- Capacity Project
- Capacity Project
- Upgrade Project
- Upgrade Project
- 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

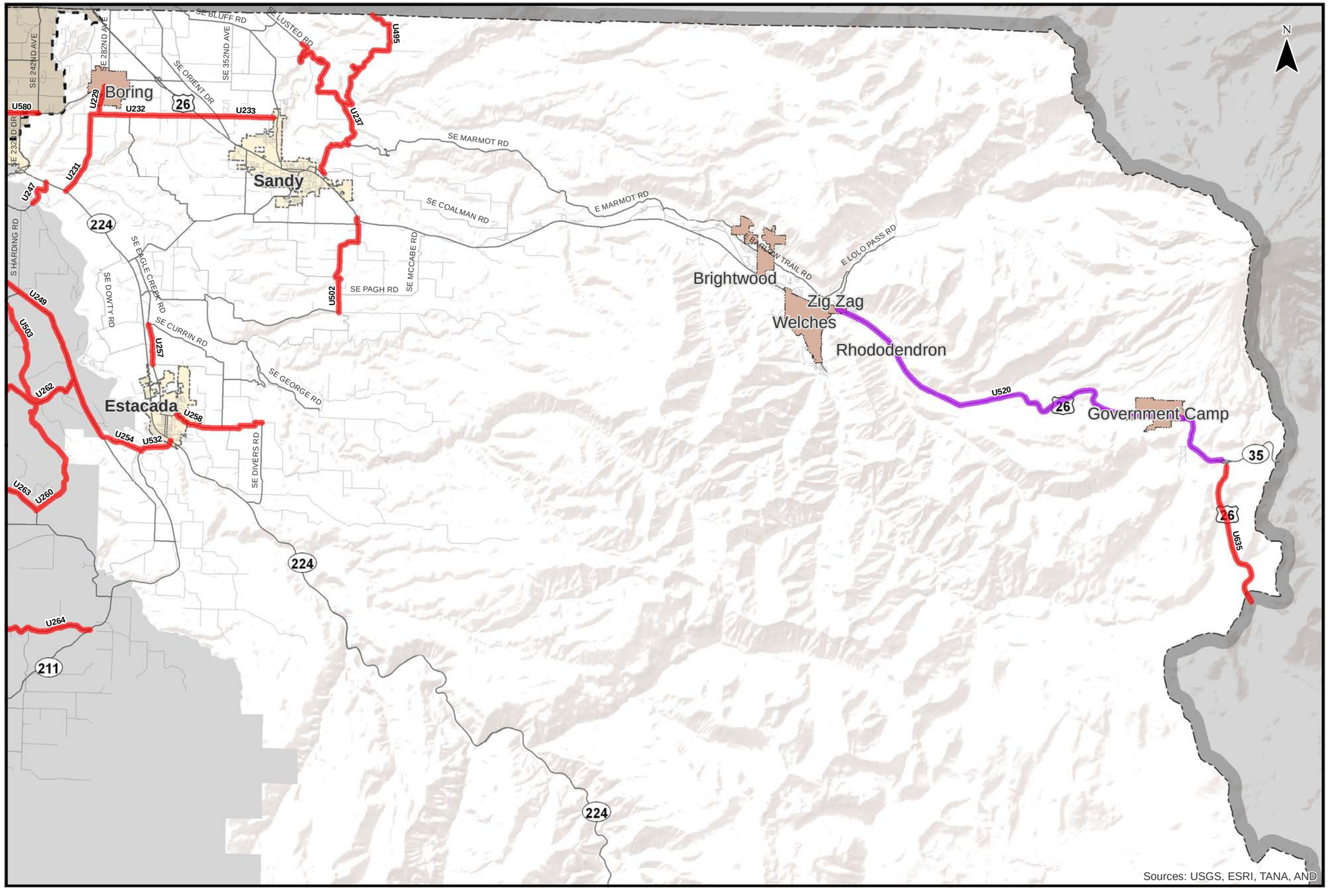
Capacity and Upgrade Projects that Do Not Address Deficiency in 70% Growth Projection Scenario Southwest County - Southern Portion

Figure
SS 2

H:\proj\file\11732 - Clackamas County TSP\70% Growth Scenario\Congested Roadways and Master Projects_Upgrade&Capacity.mxd

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

- Capacity Project
- Capacity Project
- Upgrade Project
- Upgrade Project
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 5 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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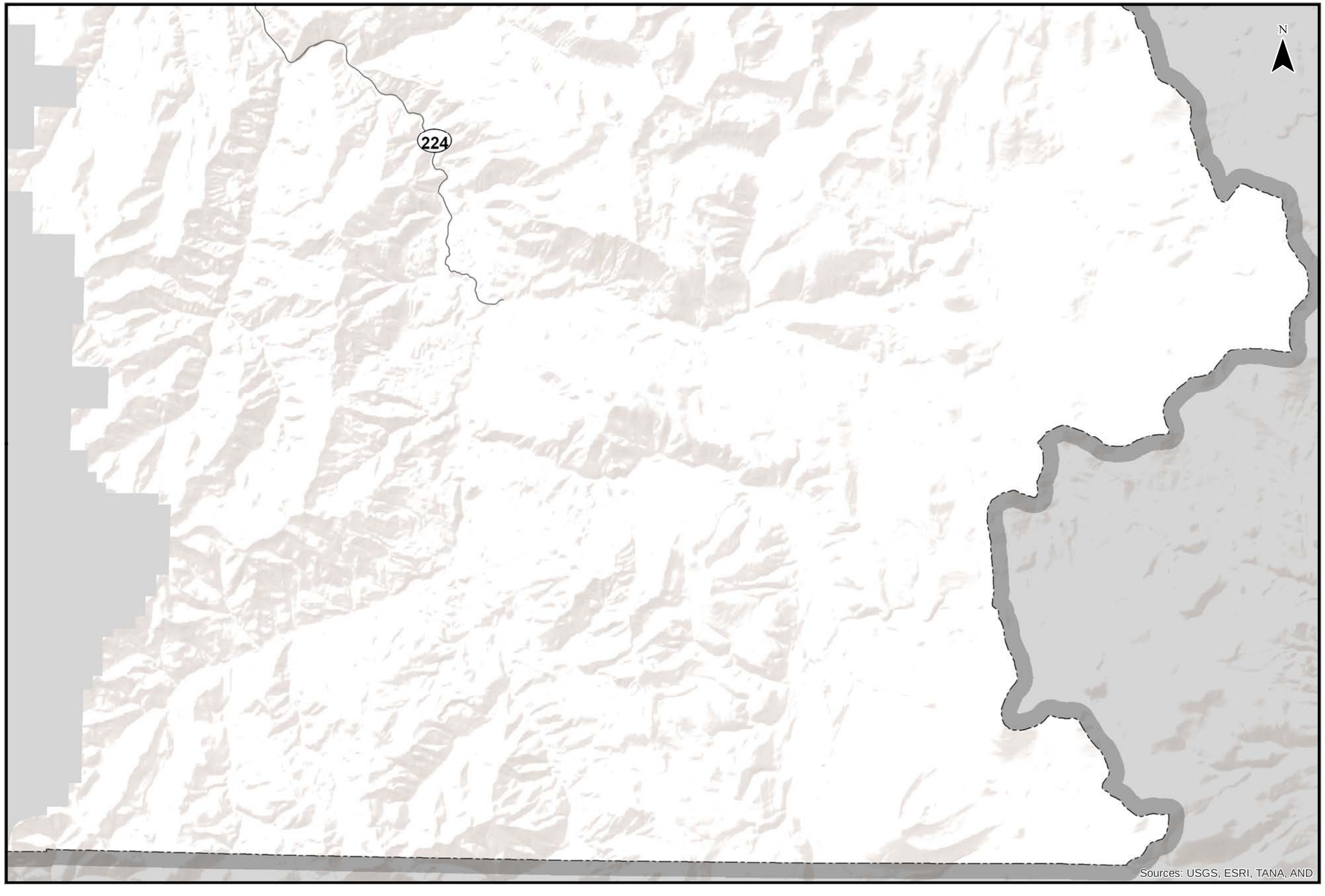
Capacity and Upgrade Projects that Do Not Address Deficiency in 70% Growth Projection Scenario East County - Northern Portion

Figure
EN 2

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

- Capacity Project
- Capacity Project
- Upgrade Project
- Upgrade Project
- 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

Capacity and Upgrade Projects that Do Not Address Deficiency in 70% Growth Projection Scenario East County - Southern Portion

Figure
ES 2

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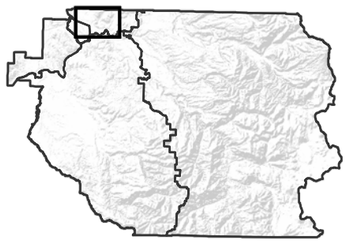
Appendix A Low Build Roadway and Intersection Performance

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Study Intersection

Does Not Meet Standards

Candidate Road Safety Audit Corridors

Very Congested >1.10

1,000 vehicles/hour

5,000 vehicles/hour

10,000 vehicles/hour

Congested 1.0 - 1.1

1,000 vehicles/hour

5,000 vehicles/hour

10,000 vehicles/hour

Some Congestion 0.9 - 1.0

1,000 vehicles/hour

5,000 vehicles/hour

10,000 vehicles/hour

Shoulders (At Least 4ft Wide)

Incorporated Areas

County Boundary

UGB

Note: Volumes reflect weekday evening peak period roadway link volumes.

0 1 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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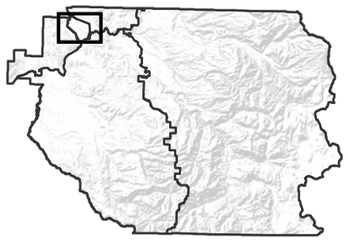
Summary of 2035 Low Build Roadway and Intersection Performance
Greater Clackamas Regional Center / Industrial Area

Figure
C X3

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Study Intersection

Does Not Meet Standards

Candidate Road Safety Audit Corridors

Very Congested >1.10

1,000 vehicles/hour

5,000 vehicles/hour

10,000 vehicles/hour

Congested 1.0 - 1.1

1,000 vehicles/hour

5,000 vehicles/hour

10,000 vehicles/hour

Some Congestion 0.9 - 1.0

1,000 vehicles/hour

5,000 vehicles/hour

10,000 vehicles/hour

Shoulders (At Least 4ft Wide)

Incorporated Areas

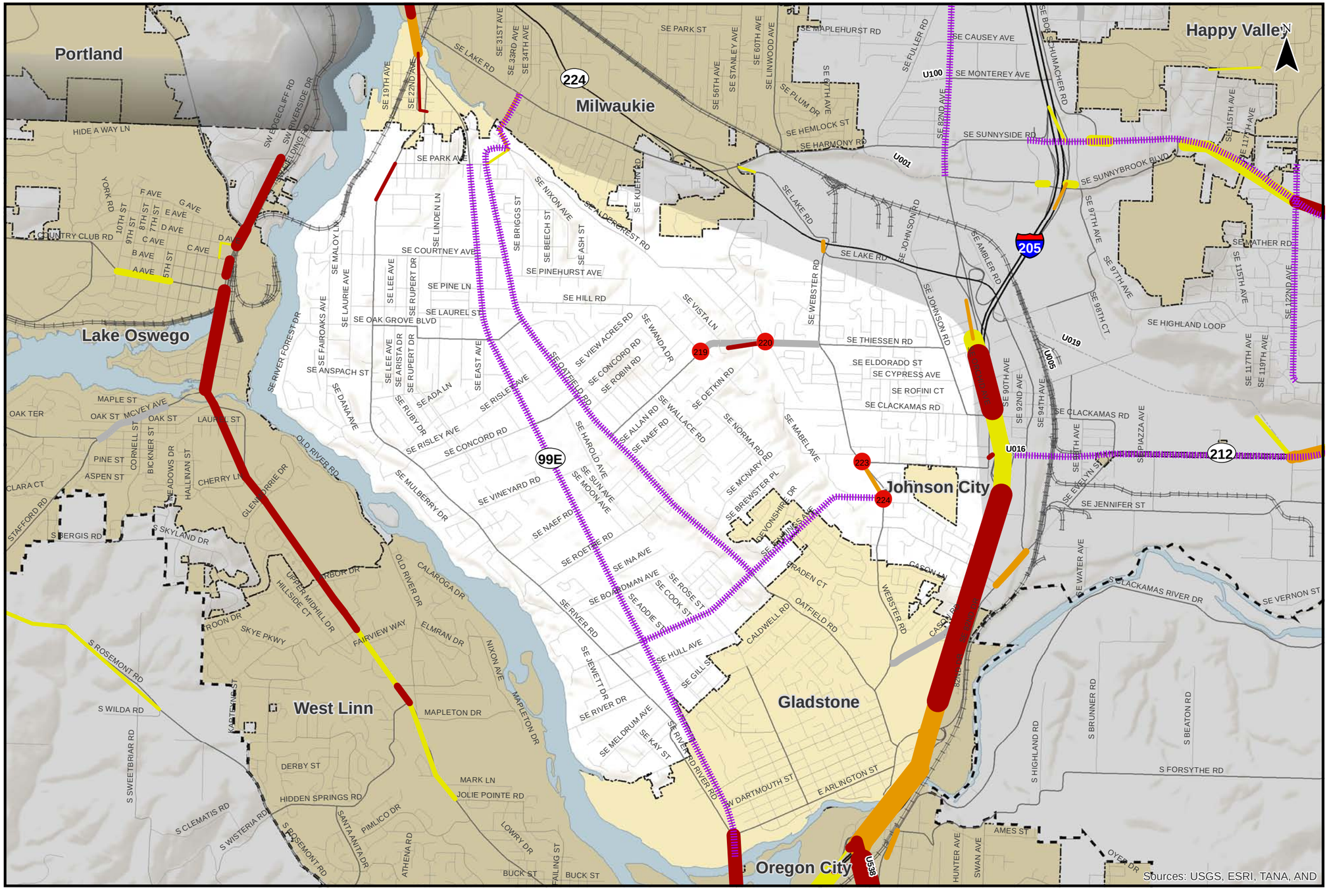
County Boundary

UGB

Note: Volumes reflect weekday evening peak period roadway link volumes.

0 1 Miles

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

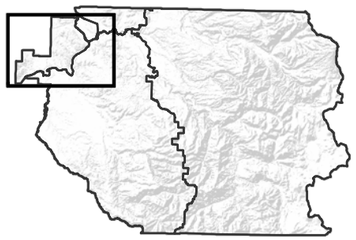


Summary of 2035 Low Build Roadway and Intersection Performance
Greater McLoughlin Area

Figure
M X3

H:\proj\file\11732 - Clackamas County TSP\gis\11x17 Maps\X3 Auto Deficiencies_ Low Build Conditions.mxd

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Study Intersection

Does Not Meet Standards

Candidate Road Safety Audit Corridors

Very Congested >1.10

1,000 vehicles/hour

5,000 vehicles/hour

10,000 vehicles/hour

Congested 1.0 - 1.1

1,000 vehicles/hour

5,000 vehicles/hour

10,000 vehicles/hour

Some Congestion 0.9 - 1.0

1,000 vehicles/hour

5,000 vehicles/hour

10,000 vehicles/hour

Shoulders (At Least 4ft Wide)

Incorporated Areas

County Boundary

UGB

Note: Volumes reflect weekday evening peak period roadway link volumes.

0 1 2 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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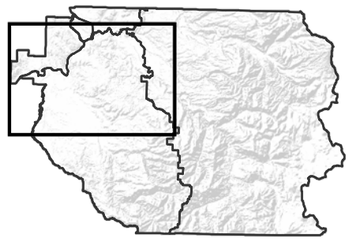
Summary of 2035 Low Build Roadway and Intersection Performance Northwest County

Figure **NW X3**

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Study Intersection

Does Not Meet Standards

Candidate Road Safety Audit Corridors

Very Congested >1.10

1,000 vehicles/hour

5,000 vehicles/hour

10,000 vehicles/hour

Congested 1.0 - 1.1

1,000 vehicles/hour

5,000 vehicles/hour

10,000 vehicles/hour

Some Congestion 0.9 - 1.0

1,000 vehicles/hour

5,000 vehicles/hour

10,000 vehicles/hour

Shoulders (At Least 4ft Wide)

Incorporated Areas

County Boundary

UGB

Note: Volumes reflect weekday evening peak period roadway link volumes.

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

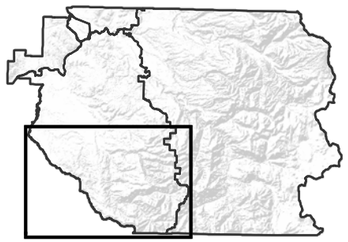
H:\profile\11732 - Clackamas County TSP\gis\11x17 Maps\X3 Auto Deficiencies_Low Build Conditions.mxd

Sources: USGS, ESRI, TANA, AND

Summary of 2035 Low Build Roadway and Intersection Performance
Southwest County - Northern Portion

Figure
SN X3

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Study Intersection

Does Not Meet Standards

Candidate Road Safety Audit Corridors

Very Congested >1.10

1,000 vehicles/hour
5,000 vehicles/hour
10,000 vehicles/hour

Congested 1.0 - 1.1

1,000 vehicles/hour
5,000 vehicles/hour
10,000 vehicles/hour

Some Congestion 0.9 - 1.0

1,000 vehicles/hour
5,000 vehicles/hour
10,000 vehicles/hour

Shoulders (At Least 4ft Wide)

Incorporated Areas

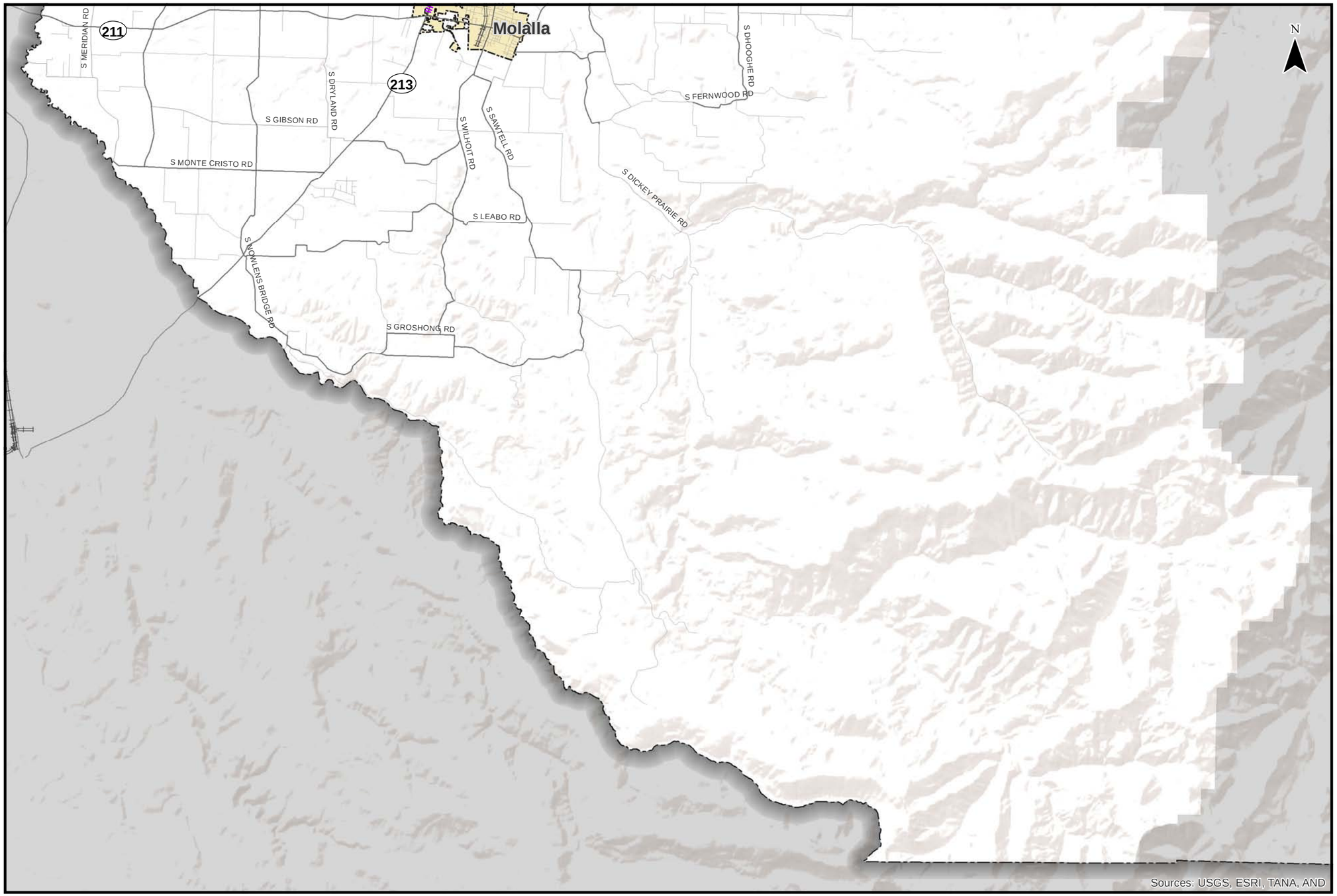
County Boundary

UGB

Note: Volumes reflect weekday evening peak period roadway link volumes.

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



Summary of 2035 Low Build Roadway and Intersection Performance
Southwest County - Southern Portion

Figure
SS X3

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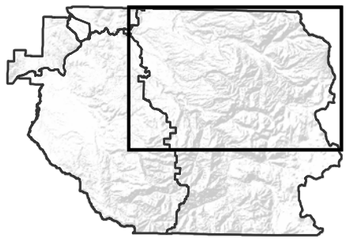
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*



Study Intersection

- Does Not Meet Standards

Candidate Road Safety Audit Corridors

Very Congested >1.10

- 1,000 vehicles/hour
- 5,000 vehicles/hour
- 10,000 vehicles/hour

Congested 1.0 - 1.1

- 1,000 vehicles/hour
- 5,000 vehicles/hour
- 10,000 vehicles/hour

Some Congestion 0.9 - 1.0

- 1,000 vehicles/hour
- 5,000 vehicles/hour
- 10,000 vehicles/hour

Shoulders (At Least 4ft Wide)

Incorporated Areas

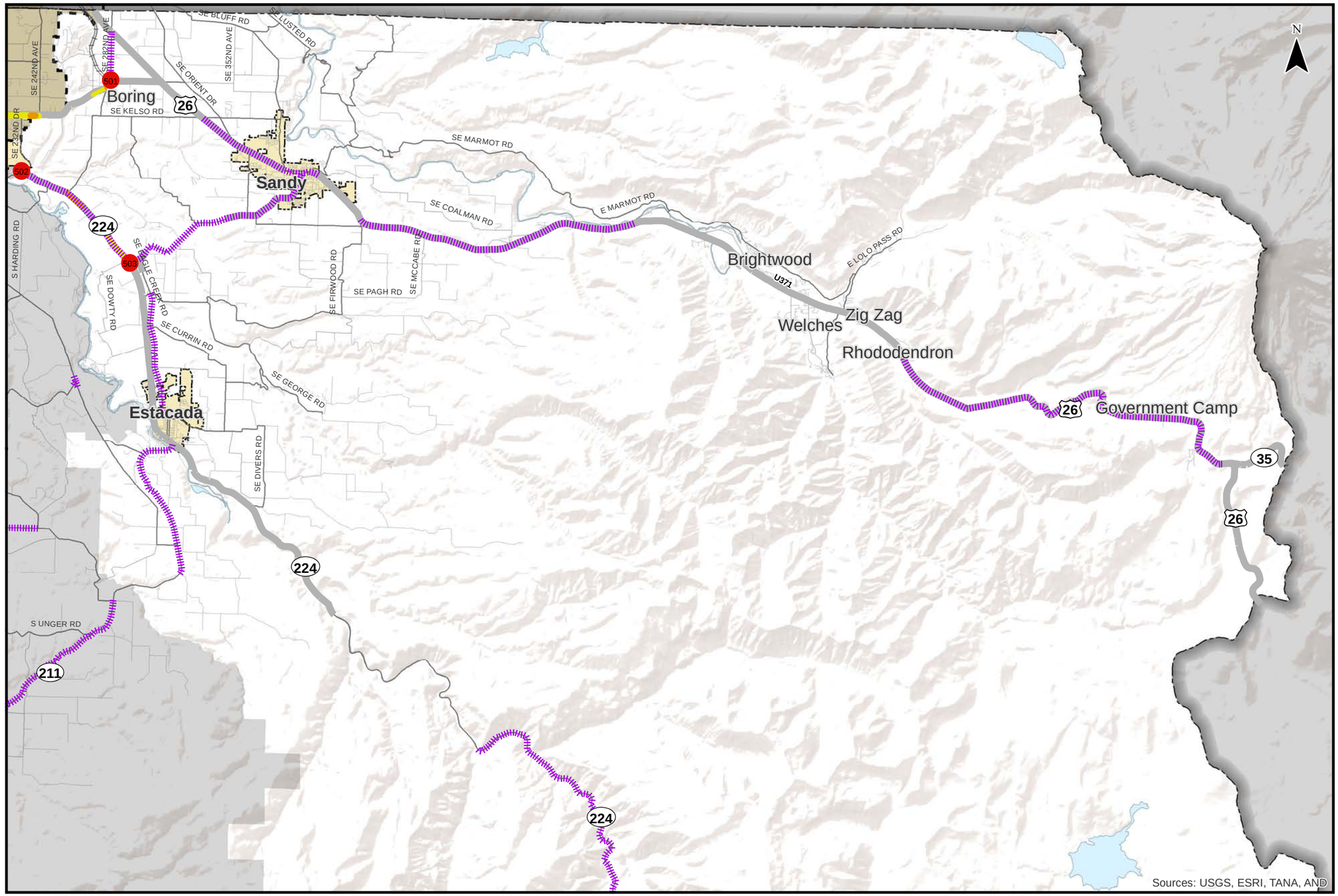
County Boundary

UGB

Note: Volumes reflect weekday evening peak period roadway link volumes.

0 1 2 3 4 5 Miles

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



Summary of 2035 Low Build Roadway and Intersection Performance
East County - Northern Portion

Figure
EN X3

H:\proffile\11732 - Clackamas County TSP\gis\11x17 Mapsl\X3 Auto Deficiencies_Low Build Conditions.mxd

CLACKAMAS COUNTY Transportation System Plan *Update*

Study Intersection

Does Not Meet Standards

Candidate Road Safety Audit Corridors

Very Congested >1.10

1,000 vehicles/hour

5,000 vehicles/hour

10,000 vehicles/hour

Congested 1.0 - 1.1

1,000 vehicles/hour

5,000 vehicles/hour

10,000 vehicles/hour

Some Congestion 0.9 - 1.0

1,000 vehicles/hour

5,000 vehicles/hour

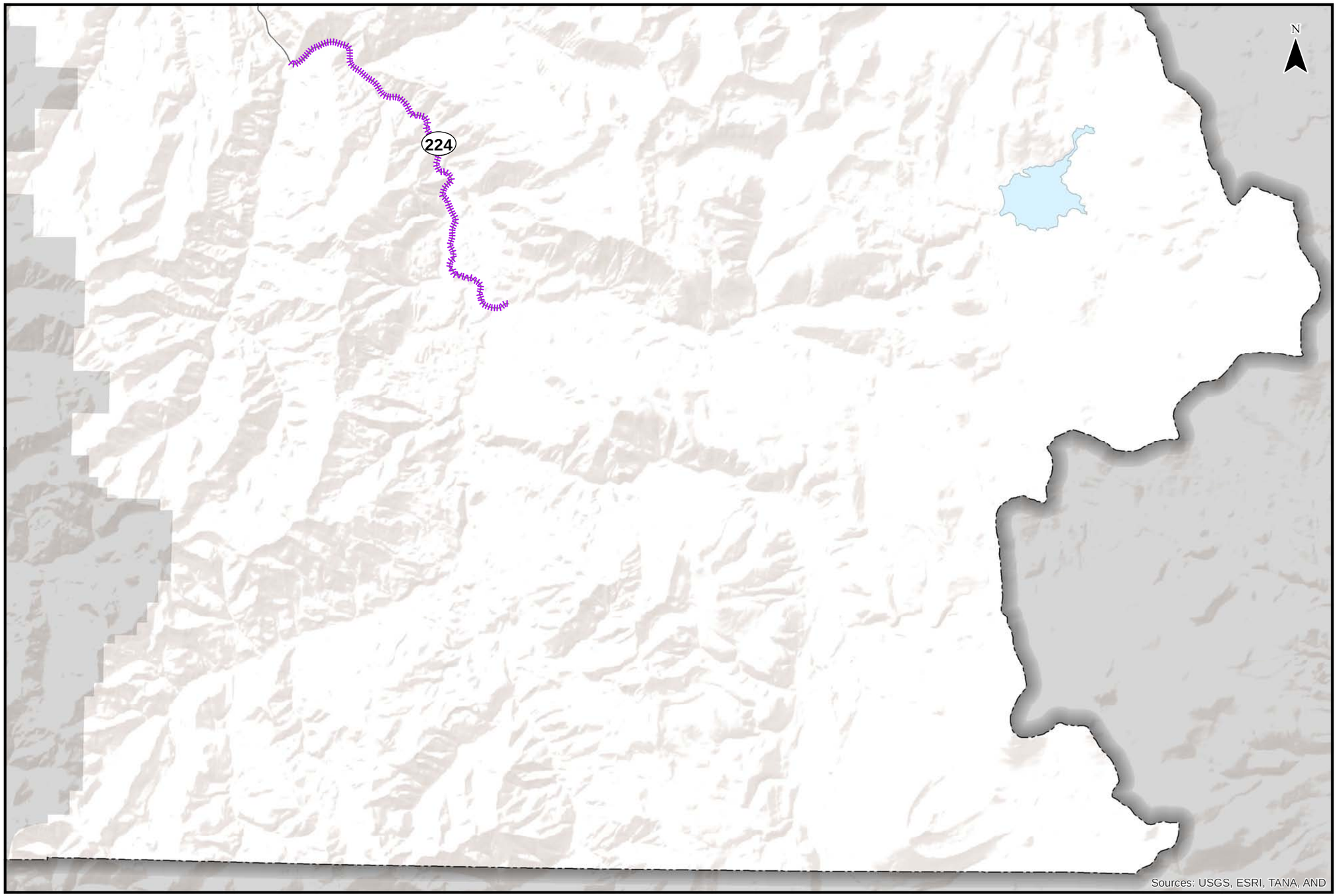
10,000 vehicles/hour

Shoulders (At Least 4ft Wide)

Incorporated Areas

County Boundary

UGB



Note: Volumes reflect weekday evening peak period roadway link volumes.

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

Summary of 2035 Low Build Roadway and Intersection Performance
East County - Southern Portion

Figure
ES X3

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Appendix B 70% Growth Scenario Intersection Operations

104 SE Johnson Creek Blvd./ 80th Ave.

LOW BUILD: CM=SB, LOS=F, Del=>50, V/C=>1.0; 110, 10, 100; 60, 910, 15; 955, 40; 40, 10, 115; STD =v/c < 0.99; DOES NOT MEET STD

70% GROWTH: CM=SB, LOS=F, Del=>50, V/C=>1.0; 105, 10, 100; 60, 855, 15; 855, 40; 35, 80, 115; STD =v/c < 0.99; DOES NOT MEET STD

124 SE Harmony Rd./ SE Linwood Ave.

LOW BUILD: LOS=F, Del=>80, V/C=>1.0; 35, 330, 75; 80, 95; 90, 265, 335; 80, 375, 500; STD =v/c < 0.99; DOES NOT MEET STD

70% GROWTH: LOS=E, Del=73.5, V/C=>1.0; 55, 235, 80; 75, 480, 70; 75, 375, 245; 65, 285, 385; STD =v/c < 0.99; DOES NOT MEET STD

138 SE Sunnybrook Blvd./ I-205 NB Ramps

LOW BUILD: LOS=D, Del=35.2, V/C=0.89; 270, 815; 300, 1005; 210, 410, 685; STD =v/c < 0.85; DOES NOT MEET STD

70% GROWTH: LOS=C, Del=30.8, V/C=0.81; 255, 745; 300, 920; 180, 390, 630; STD =v/c < 0.85

144 SE Sunnyside Rd./ SE 122nd Ave.

LOW BUILD: LOS=F, Del=>80, V/C=>1.0; 170, 175, 175; 640, 2200, 250; 155, 925, 160; 195, 290, 90; STD =v/c < 0.99; DOES NOT MEET STD

70% GROWTH: LOS=E, Del=62.3, V/C=0.96; 160, 235, 155; 585, 2035, 250; 135, 880, 145; 205, 190, 85; STD =v/c < 0.99; DOES NOT MEET STD

105 OR 213 (SE 82nd Ave)/ SE Johnson Creek Blvd

LOW BUILD: LOS=F, Del=>80, V/C=>1.0; 150, 970, 405; 185, 860, 200; 200, 715, 360; 365, 870, 420; STD =v/c < 0.99; DOES NOT MEET STD

70% GROWTH: LOS=E, Del=66.4, V/C=0.98; 130, 915, 375; 170, 790, 185; 195, 660, 370; 325, 835, 410; STD =v/c < 0.99

130 SE Sunnyside Rd./ I-205 SB Ramps

LOW BUILD: LOS=D, Del=41.2, V/C=0.98; 270, 295, 690; 1495, 395; 900, 510; STD =v/c < 0.85; DOES NOT MEET STD

70% GROWTH: LOS=C, Del=33.2, V/C=0.93; 280, 290, 680; 1405, 365; 870, 465; STD =v/c < 0.85; DOES NOT MEET STD

140 OR 224/ SE Rusk Rd.

LOW BUILD: LOS=E, Del=57.6, V/C=>1.0; 50, 115, 30; 30, 2270, 200; 20, 1340, 120; 70, 55; STD =v/c < 0.99; DOES NOT MEET STD

70% GROWTH: LOS=E, Del=62.9, V/C=>1.0; 45, 95, 25; 30, 2160, 180; 20, 1295, 110; 60, 50; STD =v/c < 0.99; DOES NOT MEET STD

146 SE Sunnyside Rd./ SE 142nd Ave.

LOW BUILD: LOS=F, Del=>80, V/C=>1.0; 10, 10, 15; 25, 1985; 20, 1165, 265; 150, 195; STD =v/c < 0.99; DOES NOT MEET STD

70% GROWTH: LOS=D, Del=53.0, V/C=0.94; 15, 5, 10; 30, 1760; 15, 1050, 200; 155, <5, 150; STD =v/c < 0.99

116 SE King Rd./ SE Fuller Rd.

LOW BUILD: CM=NB, LOS=F, Del=>50, V/C=>1.0; 20, 15, 15; <5, 460, 170; 15, 410, 160; 100, 5, 120; STD =v/c < 0.99; DOES NOT MEET STD

70% GROWTH: CM=NB, LOS=F, Del=>50, V/C=0.98; 20, 10, 15; <5, 460, 145; 15, 415, 135; 80, 5, 95; STD =v/c < 0.99; DOES NOT MEET STD

131 SE Sunnyside Rd./ I-205 NB Ramps

LOW BUILD: LOS=C, Del=23.4, V/C=0.88; 520, 1775; 600, 1265; 185, 5, 370; STD =v/c < 0.85; DOES NOT MEET STD

70% GROWTH: LOS=C, Del=21.8, V/C=0.79; 500, 1690; 590, 1200; 170, 5, 345; STD =v/c < 0.85; DOES NOT MEET STD

141 OR 224/SE Lake Rd./ SE Webster Rd.

LOW BUILD: LOS=F, Del=>80, V/C=>1.0; 15, 330, 315; 5, 1915, 405; 65, 1285, 210; 175, 110, 175; STD =v/c < 0.99; DOES NOT MEET STD

70% GROWTH: LOS=E, Del=72.1, V/C=>1.0; 10, 295, 270; 5, 1805, 405; 65, 1240, 210; 160, 110, 160; STD =v/c < 0.99; DOES NOT MEET STD

153 OR 212/ I-205 SB Ramps

LOW BUILD: LOS=D, Del=51.1, V/C=>1.0; 390; 870, 190; 650, 610; 905; STD =v/c < 0.85; DOES NOT MEET STD

70% GROWTH: LOS=D, Del=43.9, V/C=>1.0; 410; 835, 165; 600, 605; 905; STD =v/c < 0.85; DOES NOT MEET STD

123 SE Lake Rd./ SE International Way

LOW BUILD: LOS=F, Del=>80, V/C=>1.0; 75, 145, 475; 65, 895, 30; 180, 815, 370; 30, 40, 240; STD =v/c < 0.99; DOES NOT MEET STD

70% GROWTH: LOS=F, Del=>80, V/C=>1.0; 65, 130, 390; 50, 750, 30; 135, 675, 310; 30, 35, 230; STD =v/c < 0.99; DOES NOT MEET STD

136 OR 213 (SE 82nd Ave)/ SE Sunnybrook Blvd

LOW BUILD: LOS=F, Del=>80, V/C=>1.0; 1350, 175; <5, 440, 210; 275, 405, 410; 1205, 335; STD =v/c < 1.1; DOES NOT MEET STD

70% GROWTH: LOS=C, Del=30.2, V/C=0.67; 1240, 215; <5, <5, <5; 280, <5, 375; 1170, 375; STD =v/c < 1.1; DOES NOT MEET STD

143 OR 224/ SE Johnson Rd.

LOW BUILD: LOS=F, Del=>80, V/C=>1.0; 40, 30, 215; 40, 2820, 35; 110, 1525, 455; 50, 15, 465; STD =v/c < 0.99; DOES NOT MEET STD

70% GROWTH: LOS=F, Del=>80, V/C=>1.0; 45, 30, 210; 40, 2510, 30; 105, 1450, 395; 50, 15, 420; STD =v/c < 0.99; DOES NOT MEET STD

157 OR 224/SE Hubbard Rd./SE 135th Ave.

LOW BUILD: LOS=F, Del=>80, V/C=>1.0; 170, 90, 350; 315, 3175, 35; 220, 1685, 175; 40, 135, 630; STD =v/c < 0.99; DOES NOT MEET STD

70% GROWTH: LOS=F, Del=>80, V/C=>1.0; 145, 75, 300; 290, 2705, 30; 200, 1425, 160; 35, 185, 570; STD =v/c < 0.99; DOES NOT MEET STD

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
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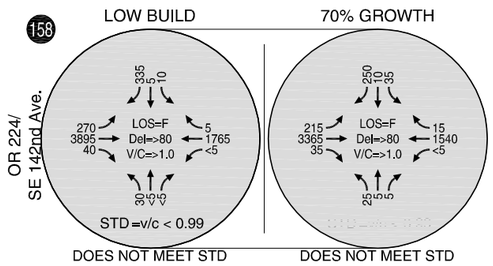
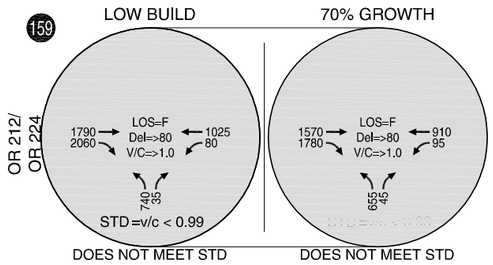
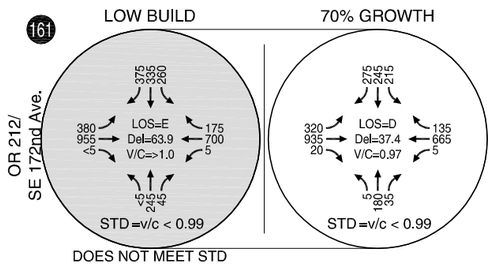
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
STD = OPERATIONAL STANDARD
AWSC = ALL-WAY STOP CONTROL

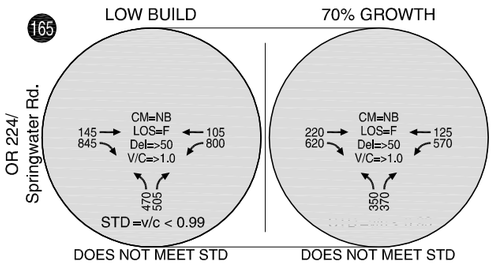
70% Growth Scenario Intersection Operations
PM Peak Hour
Greater Clackamas Regional Center/Industrial Area - 1

Figure C 70%









CM	=	CRITICAL MOVEMENT (UNSIGNALIZED)
LOS	=	INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
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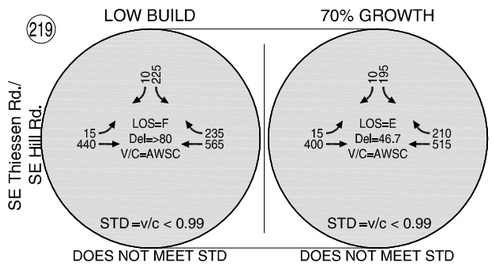
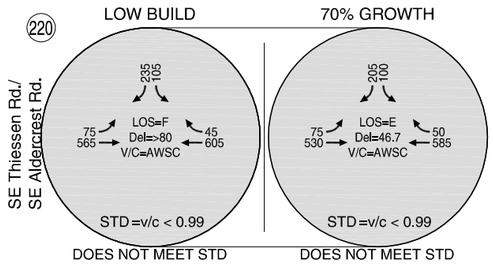
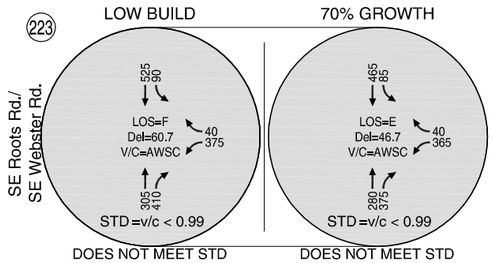
V/C	=	CRITICAL VOLUME-TO-CAPACITY RATIO
STD	=	OPERATIONAL STANDARD
AWSC	=	ALL-WAY STOP CONTROL

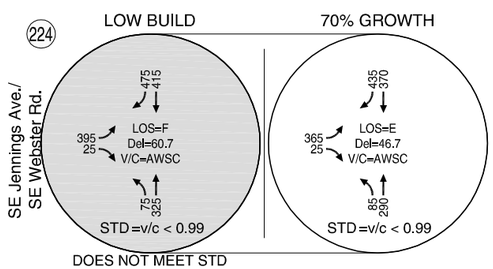
70% Growth Scenario Intersection Operations
PM Peak Hour
Greater Clackamas Regional Center/Industrial Area - 2

Figure
C 70%









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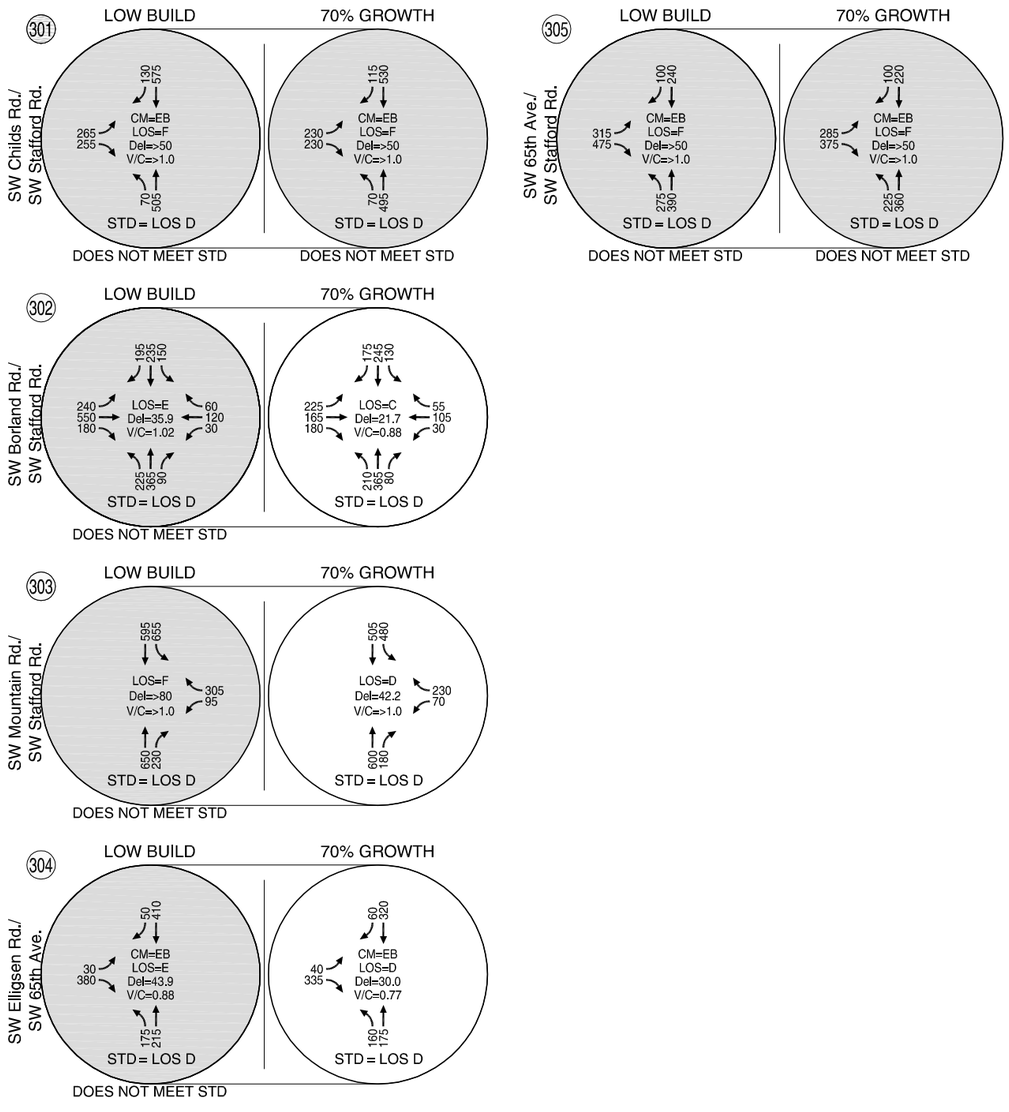
70% Growth Scenario Intersection Operations
PM Peak Hour
Greater McLoughlin Area

Figure
M 70%



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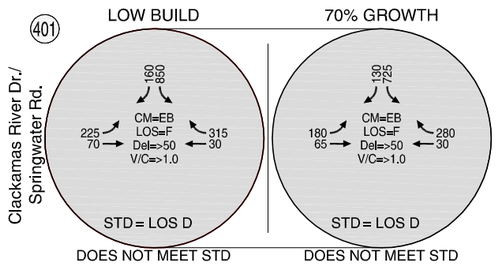
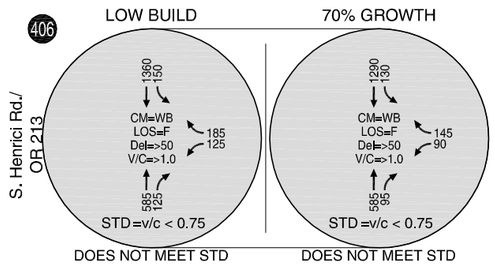
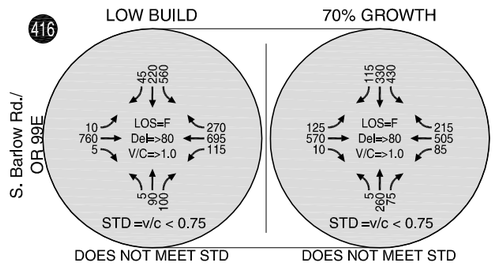
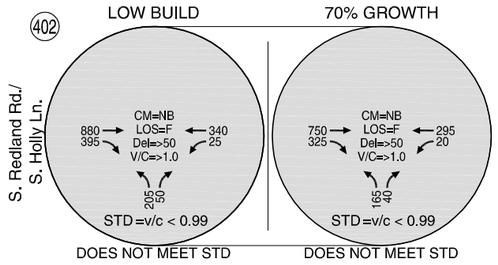
70% Growth Scenario Intersection Operations
PM Peak Hour
Northwest County

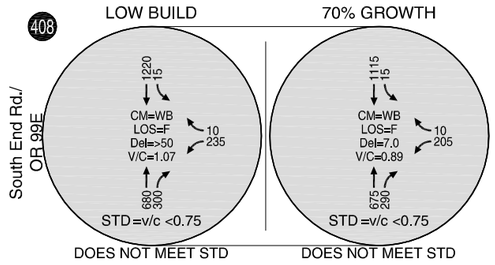
Figure
NW 70%

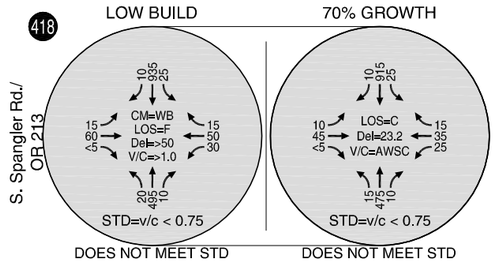


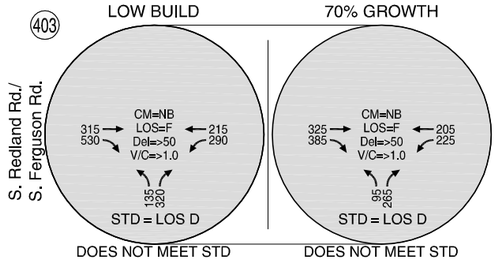


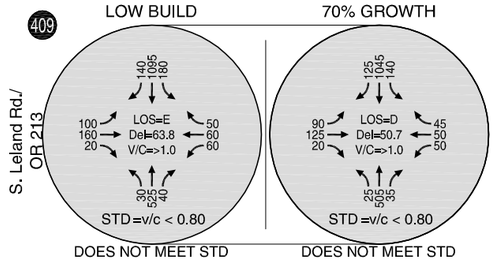


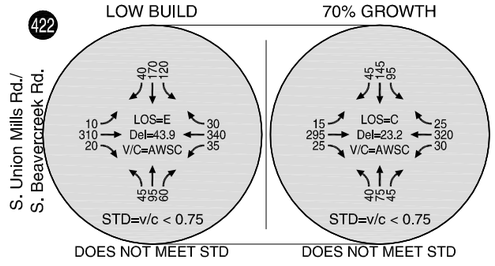


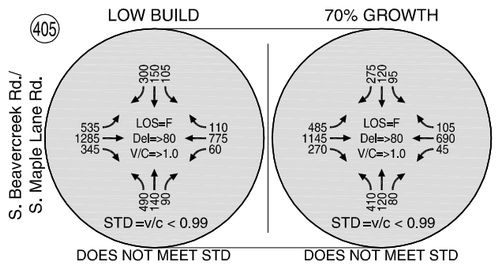


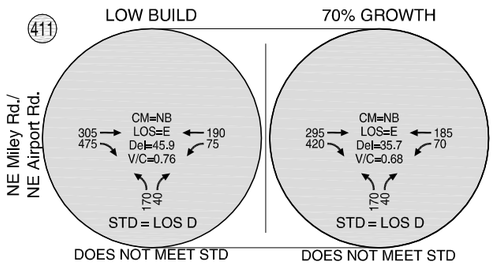












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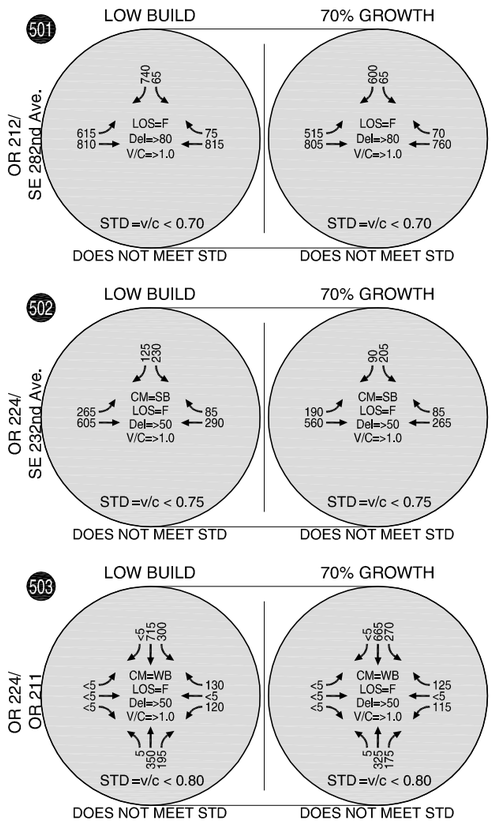
70% Growth Scenario Intersection Operations
PM Peak Hour
Southwest County

Figure
S 70%



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V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
STD = OPERATIONAL STANDARD

70% Growth Scenario Intersection Operations
PM Peak Hour
East County

Figure
E 70%

Appendix C Roadway Congestion

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

Very Congested under Low Build
- 1,000
- 5,000
- 10,000

Congested under Low Build
- 1,000
- 5,000
- 10,000

Very Congested under 70% Growth
- 1,000
- 5,000
- 10,000

Congested under 70% Growth
- 1,000
- 5,000
- 10,000

- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.

0 1 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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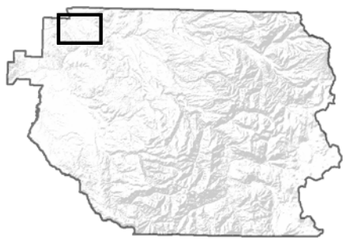
Evening Weekday Peak Hour Roadway Segment Congestion: Low Build versus 70% Growth Scenario
Greater Clackamas Regional Center / Industrial Area

Figure
C 1

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Very Congested under Low Build
- 1,000
- 5,000
- 10,000

Congested under Low Build
- 1,000
- 5,000
- 10,000

Very Congested under 70% Growth
- 1,000
- 5,000
- 10,000

Congested under 70% Growth
- 1,000
- 5,000
- 10,000

- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.

0 1 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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Evening Weekday Peak Hour Roadway Segment Congestion: Low Build versus 70% Growth Scenario
Greater McLoughlin Area

Figure
M 1

Sources: USGS, ESRI, TANA, AND

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

Very Congested under Low Build
- 1,000
- 5,000
- 10,000

Congested under Low Build
- 1,000
- 5,000
- 10,000

Very Congested under 70% Growth
- 1,000
- 5,000
- 10,000

Congested under 70% Growth
- 1,000
- 5,000
- 10,000
- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.

0 1 2 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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Beaverton, Tigard, King City, Durham, Tualatin, Sherwood, Wilsonville, Portland, Lake Oswego, Rivergrove, Milwaukie, Happy Valley, Johnson City, Gladstone, West Linn, Oregon City, Beavercreek, Canby

Sources: USGS, ESRI, TANA, AND

Evening Weekday Peak Hour Roadway Segment Congestion: Low Build versus 70% Growth Scenario Northwest County

Figure
NW 1

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

Very Congested under Low Build
- 1,000
- 5,000
- 10,000

Congested under Low Build
- 1,000
- 5,000
- 10,000

Very Congested under 70% Growth
- 1,000
- 5,000
- 10,000

Congested under 70% Growth
- 1,000
- 5,000
- 10,000
- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.

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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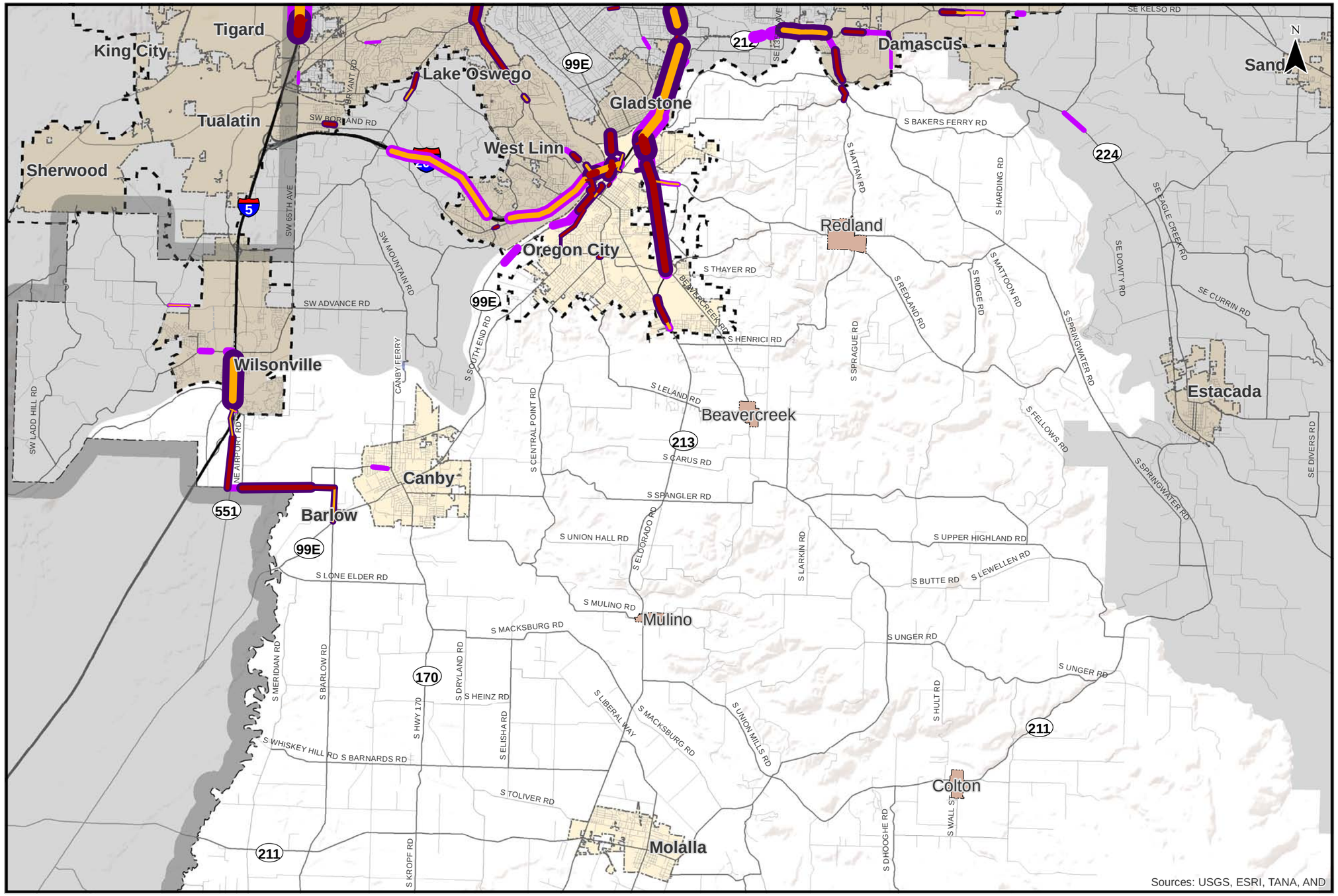


Evening Weekday Peak Hour Roadway Segment Congestion: Low Build versus 70% Growth Scenario
Southwest County - Northern Portion

Figure
SN 1

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*

Very Congested under Low Build

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

Congested under Low Build

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

Very Congested under 70% Growth

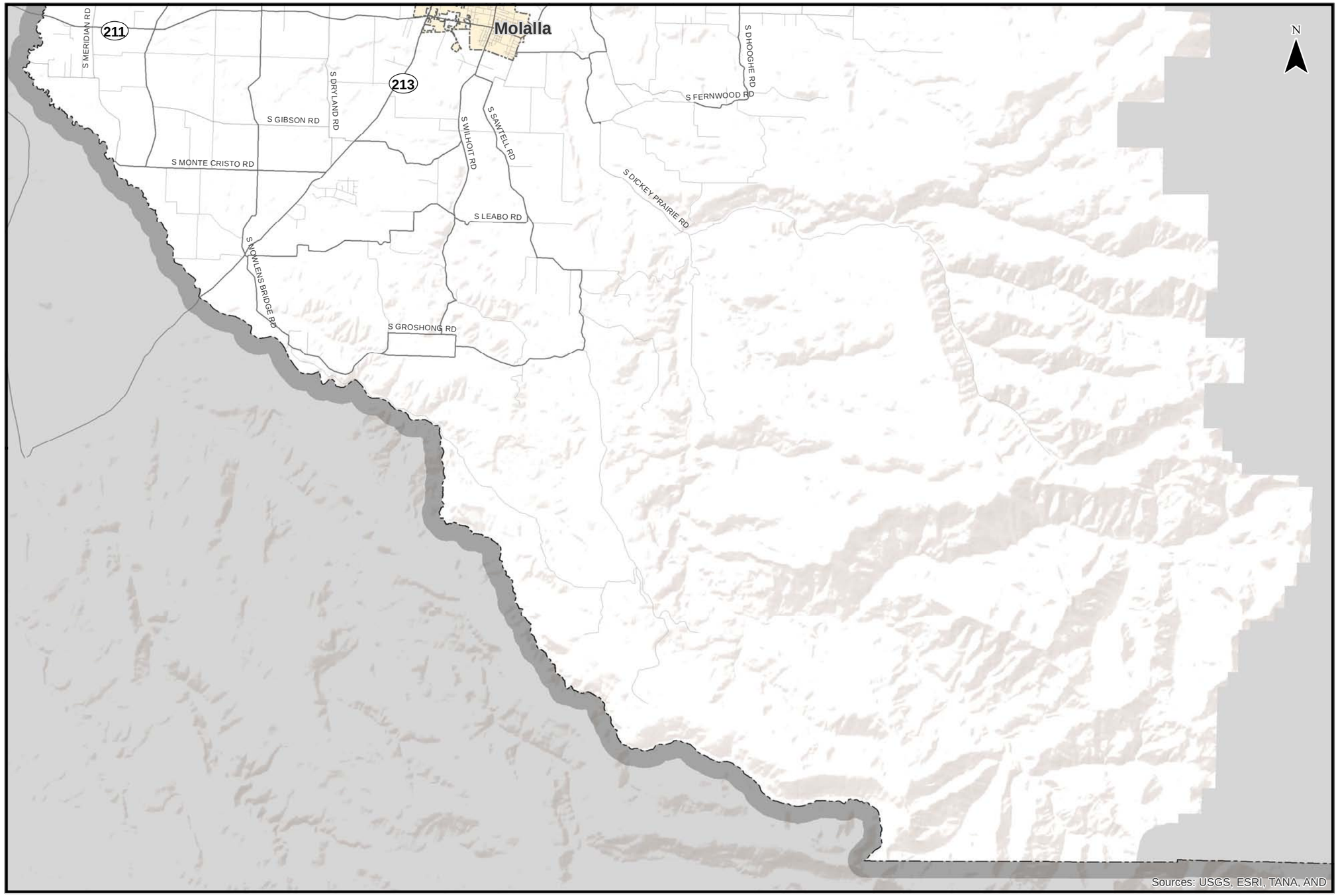
- 1,000
- 5,000
- 10,000

Congested under 70% Growth

- 1,000
- 5,000
- 10,000
- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.



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

Evening Weekday Peak Hour Roadway Segment Congestion: Low Build versus 70% Growth Scenario
Southwest County - Southern Portion

Figure
SS 1

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CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*

Very Congested under Low Build
- 1,000
- 5,000
- 10,000

Congested under Low Build
- 1,000
- 5,000
- 10,000

Very Congested under 70% Growth
- 1,000
- 5,000
- 10,000

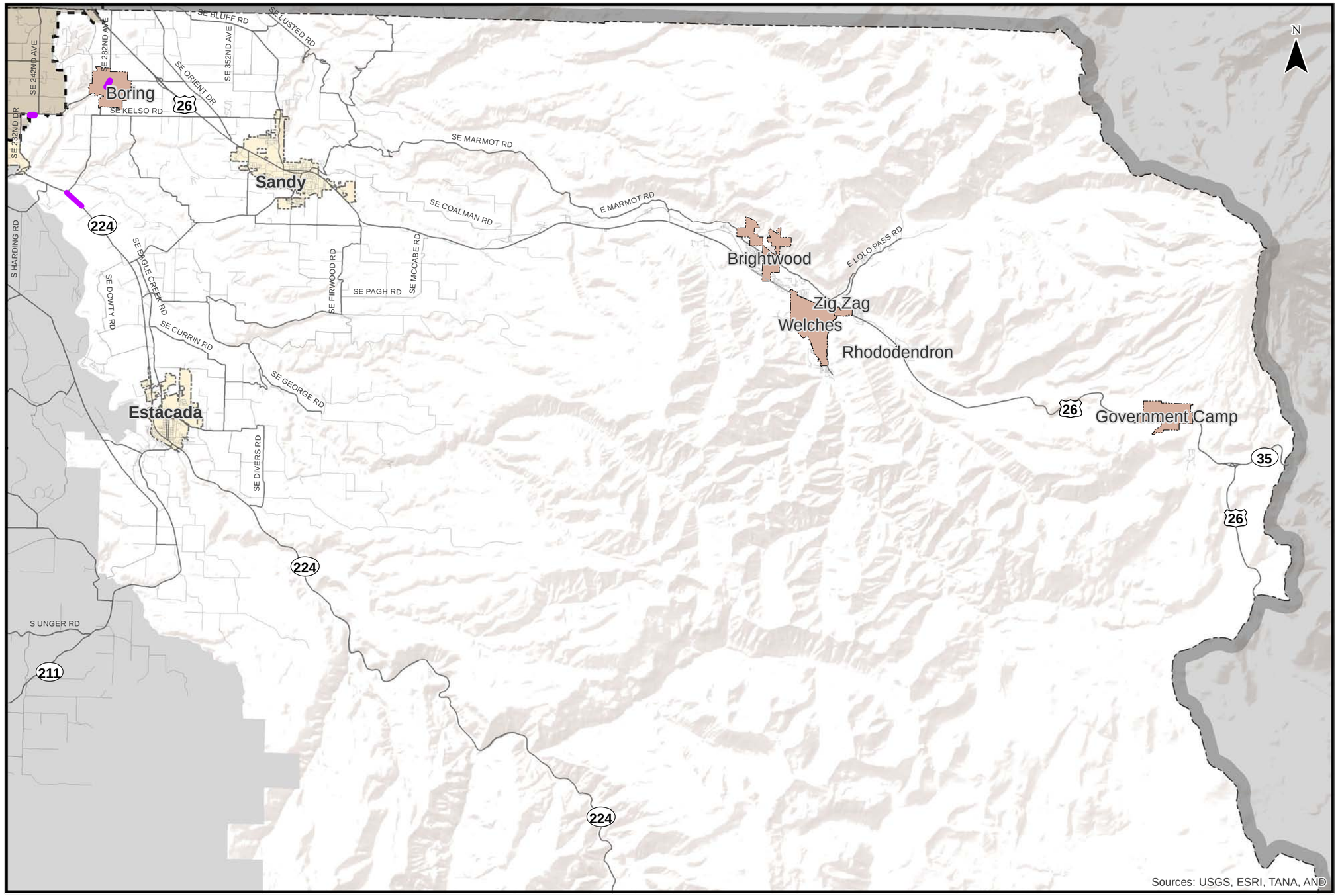
Congested under 70% Growth
- 1,000
- 5,000
- 10,000
- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.

0 1 2 3 4 5 Miles

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



Evening Weekday Peak Hour Roadway Segment Congestion: Low Build versus 70% Growth Scenario
East County - Northern Portion

Figure
EN 1

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CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*

Very Congested under Low Build
- 1,000
- 5,000
- 10,000

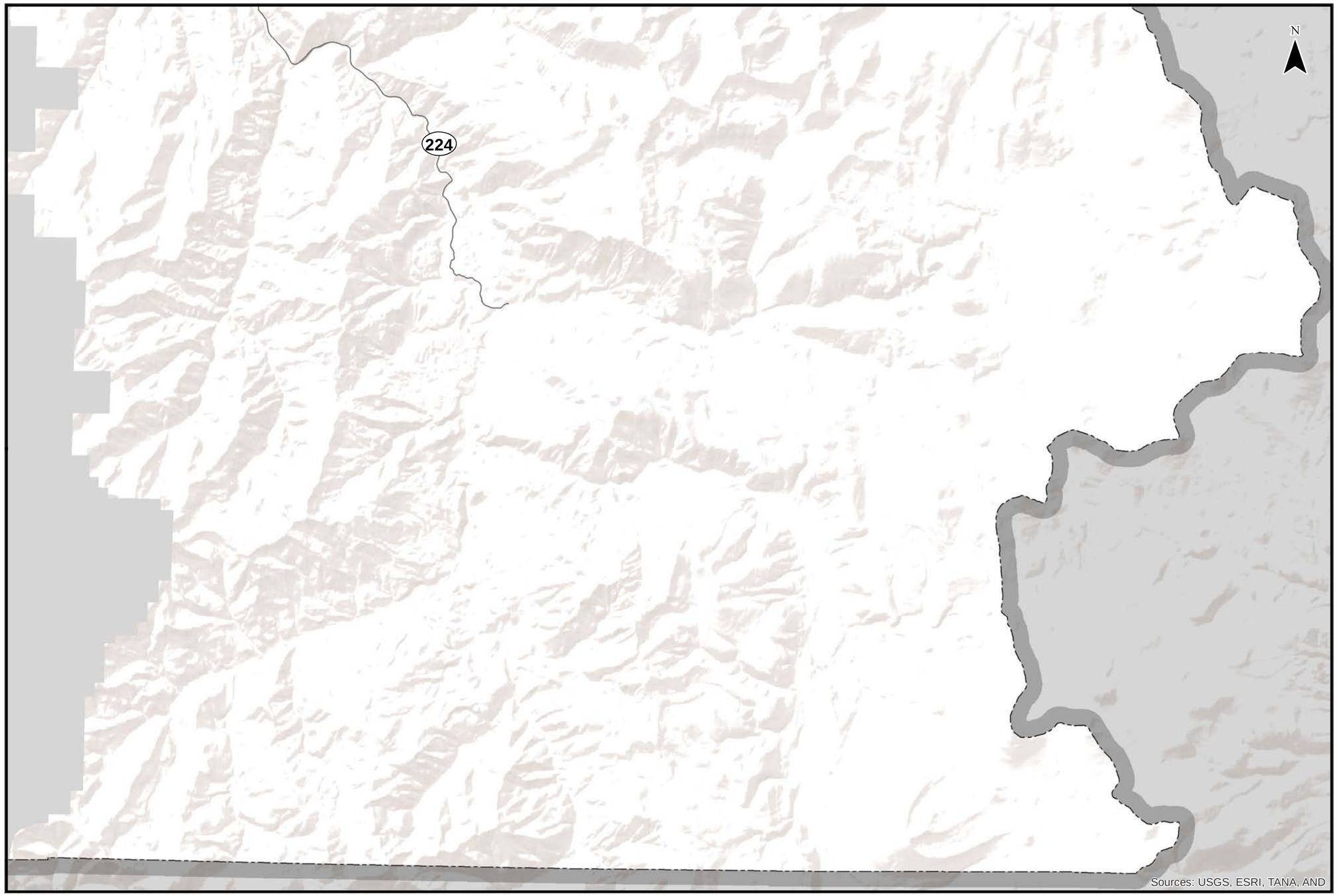
Congested under Low Build
- 1,000
- 5,000
- 10,000

Very Congested under 70% Growth
- 1,000
- 5,000
- 10,000

Congested under 70% Growth
- 1,000
- 5,000
- 10,000
- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.



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

Evening Weekday Peak Hour Roadway Segment Congestion: Low Build versus 70% Growth Scenario
East County - Southern Portion

Figure
ES 1

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CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

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

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

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

Nearing Congestion 0.9 - 1.0
- 1,000
- 5,000
- 10,000

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

0 1 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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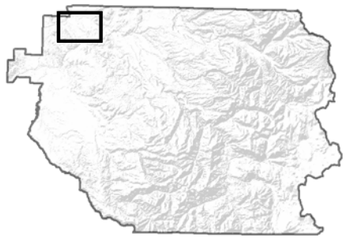
Evening Weekday Peak Hour Roadway Segment Congestion 70% Growth Scenario
Greater Clackamas Regional Center / Industrial Area

Figure
C 70%

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



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

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

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

Nearing Congestion 0.9 - 1.0
- 1,000
- 5,000
- 10,000

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

0 1 Miles

Coordinate System:
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Evening Weekday Peak Hour Roadway Segment Congestion 70% Growth Scenario
Greater McLoughlin Area

Figure
M 70%

Sources: USGS, ESRI, TANA, AND

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

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

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

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

Nearing Congestion 0.9 - 1.0
- 1,000
- 5,000
- 10,000

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

0 1 2 Miles

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

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Evening Weekday Peak Hour Roadway Segment Congestion 70% Growth Scenario Northwest County

Figure
NW 70%

Sources: USGS, ESRI, TANA, AND

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

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

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

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

Nearing Congestion 0.9 - 1.0
- 1,000
- 5,000
- 10,000

Less Congested <0.8
- 1,000
- 5,000
- 10,000
- 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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Tigard
King City
Tualatin
Sherwood
Wilsonville
Lake Oswego
West Linn
Oregon City
Gladstone
Happy Valley
Damascus
Sandy
Redland
Redland
Beavercreek
Beavercreek
Canby
Barlow
Estacada
Mulino
Colton
Colton
Molalla

SW BORLAND RD
SW BAKER RD
SW 65TH AVE
SW MOUNTAIN RD
SW ADVANCE RD
SW LADD HILL RD
NE AIRPORT RD
CANBY FERRY
S SOUTH END RD
S CENTRAL POINT RD
S THAYER RD
BEAVERCREEK RD
S HENRICI RD
S LELAND RD
S CARUS RD
S SPANGLER RD
S UNION HALL RD
S LONE ELDER RD
S MACKSBURG RD
S WHISKEY HILL RD S BARNARDS RD
S TOLIVER RD
S MERIDIAN RD
S BARLOW RD
S HWY 170
S DRYLAND RD
S HEINZ RD
S ELISHA RD
S KROPF RD
S LIBERAL WAY
S UNION MILLS RD
S HULT RD
S WALL ST
S DHOOGHE RD
S LARKIN RD
S ELDORADO RD
S SPRAGUE RD
S REDLAND RD
S RIDGE RD
S MATTOON RD
S HARDING RD
S HATTAN RD
S BAKERS FERRY RD
S UPPER HIGHLAND RD
S BUTTE RD
S LEWELLEN RD
S UNGER RD
S FELLOWS RD
S SPRINGWATER RD
SE KELSO RD
SE EAGLE CREEK RD
SE DOWTY RD
SE CURRIN RD
SE DIVERS RD

Sources: USGS, ESRI, TANA, AND

Evening Weekday Peak Hour Roadway Segment Congestion 70% Growth Scenario
Southwest County - Northern Portion

Figure
SN 70%

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

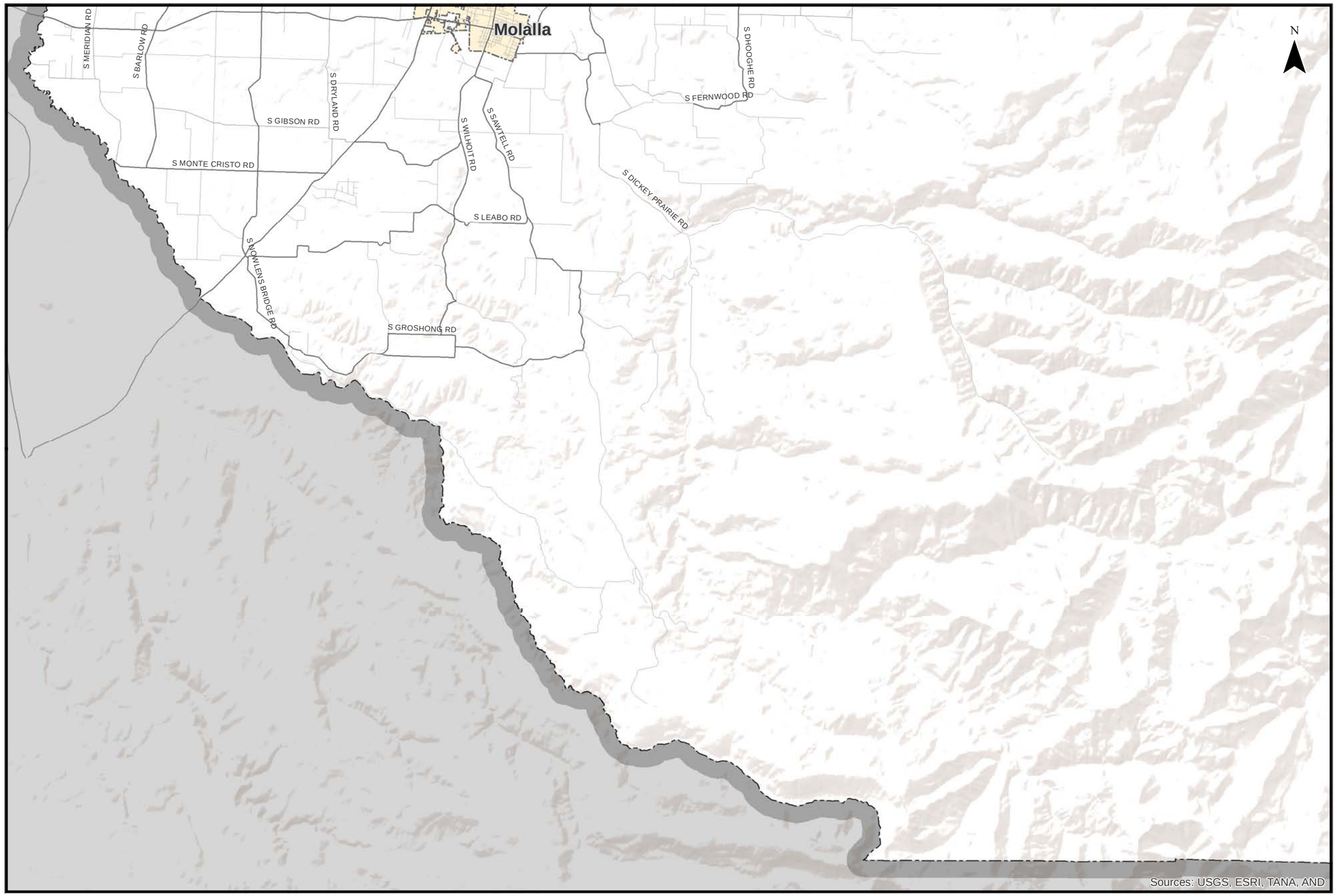
Very Congested >1.10
- 1,000
- 5,000
- 10,000

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

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

Nearing Congestion 0.9 - 1.0
- 1,000
- 5,000
- 10,000

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



0 1 2 3 4 Miles

Coordinate System:
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Data Source:
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Evening Weekday Peak Hour Roadway Segment Congestion 70% Growth Scenario Southwest County - Southern Portion

Figure
SS 70%

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CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

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

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

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

Nearing Congestion 0.9 - 1.0
- 1,000
- 5,000
- 10,000

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

0 1 2 3 4 5 Miles

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

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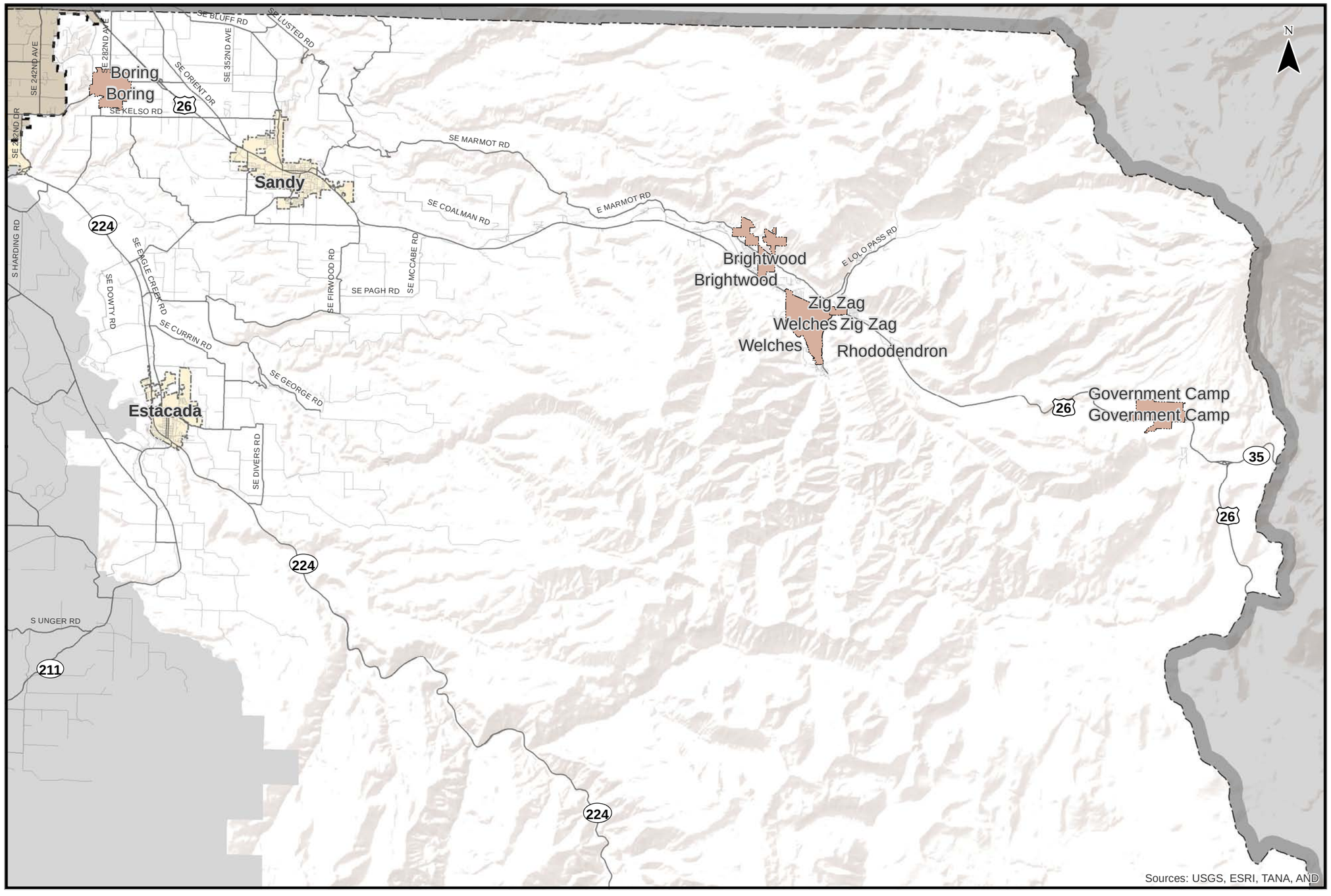

Evening Weekday Peak Hour Roadway Segment Congestion 70% Growth Scenario
East County - Northern Portion

Figure
EN 70%

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*

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

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

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

Nearing Congestion 0.9 - 1.0
- 1,000
- 5,000
- 10,000

Less Congested <0.8
- 1,000
- 5,000
- 10,000
- 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:
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Evening Weekday Peak Hour Roadway Segment Congestion 70% Growth Scenario East County - Southern Portion

Figure
ES 70%

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Appendix D Assessment of Vehicle Capacity Projects

Vehicle Capacity Projects on Master List (Appendix D)

1000 - 1999: Public Suggested Projects

2000 - 2999: New Identified Projects

U000 - U999: Previously Planned Projects

TAC: Technical Advisory Committee

GAPS: Geographic Area Projects

VOH: Virtual Open House

PAC: Public Advisory Committee

PBAC: Pedestrian and Bicycle Action Committee

TSP Update ID	Geographic Area	Project Name / Street Name	Segment / Locations	Project Description	Project Category	Identified Capacity Deficiency Under 70% Growth?	Notes	Comment
2114	CRCIA	Johnson Creek Blvd	Johnson Creek Blvd / 80th Ave intersection	Add signal	Urban Upgrade - Vehicle Capacity	Yes		#N/A
2115	CRCIA	Lake Rd	Lake Rd / International Way intersection	Add right-turn lane on Lake Rd	Urban Upgrade - Vehicle Capacity	Yes		#N/A
2116	CRCIA	Harmony Rd	Harmony Rd / Linwood Ave intersection	Add second left-turn lane on Harmony Rd, adjust signal timing	Urban Upgrade - Vehicle Capacity	Yes		#N/A
2118	CRCIA	OR 224	OR 224 / Lake Rd / Webster Rd intersection	Add second left-turn lane on westbound OR 224	Urban Upgrade - Vehicle Capacity	Yes		#N/A
2119	CRCIA	OR 224	OR 224 / Johnson Rd intersection	Add second left-turn lane on westbound OR 224	Urban Upgrade - Vehicle Capacity	Yes		#N/A
2120	CRCIA	OR 212	OR 212 / I-205 southbound Ramps intersection	Add eastbound right-turn lane on OR 212	Urban Upgrade - Vehicle Capacity	Yes		#N/A
2121	CRCIA	OR 224	OR 224 / Hubbard Rd / 135th Ave intersection	Add intersection improvements, including right-turn lanes	Urban Upgrade - Vehicle Capacity	Yes		#N/A
U443	CRCIA	OR 224	Springwater Rd / OR 224 intersection	Add signal and turn lanes on all approaches	Urban Upgrade - Vehicle Capacity	Yes		#N/A
U543	CRCIA	OR 224	Metro boundary to Springwater Rd	Widen to 4 lanes with left-turn lanes	Urban Upgrade - Vehicle Capacity	Yes		#N/A
2112	McLoughlin	Thiessen Rd	Thiessen Rd / Hill Rd intersection	Add right-turn lane on Thiessen Rd; consider converting to two-way stop controlled or installing roundabout	Urban Upgrade - Vehicle Capacity	Yes		#N/A
2113	McLoughlin	Thiessen Rd	Thiessen Rd / Aldercrest Rd intersection	Add turn lanes on Thiessen Rd; consider converting to two-way stop controlled	Urban Upgrade - Vehicle Capacity	Yes		#N/A
U004	McLoughlin	Webster Rd	Webster Rd / Jennings Ave and Webster Rd / Roots Rd intersections	Construct traffic signals, turn lanes	Urban Upgrade - Vehicle Capacity	Yes (at Webster Rd/Roots)	Safety benefit	#N/A
U169	Northwest	Stafford Rd	Stafford Rd / Childs Rd intersection	Install traffic signal and southbound and northbound turn lanes	Rural Upgrade - Vehicle Capacity	Yes		#N/A
U180	Northwest	65th Ave	65th Ave / Elligsen Rd / Stafford Rd intersection	Construct roundabout	Rural Upgrade - Vehicle Capacity	Yes		#N/A
1007	Southwest	OR 213	OR 213 / Spangler Rd intersection	Install traffic signal to replace existing two-way stop	Rural Upgrade - Vehicle Capacity	Yes		#N/A
2107	Southwest	Springwater Rd	Springwater Rd / Clackamas River Dr intersection	Install signal and second southbound left-turn lane on Clackamas River Dr	Rural Upgrade - Vehicle Capacity	Yes		#N/A
2108	Southwest	Beavercreek Rd	Beavercreek Rd / Maplelane Rd intersection	Add right-turn lanes on Beavercreek Rd, dual left-turn lane on northbound access	Urban Upgrade - Vehicle Capacity	Yes		#N/A
2109	Southwest	OR 213	OR 213 / Henrici Rd intersection	Install traffic signal or roundabout	Rural Upgrade - Vehicle Capacity	Yes		#N/A

TSP Update ID	Geographic Area	Project Name / Street Name	Segment / Locations	Project Description	Project Category	Identified Capacity Deficiency Under 70% Growth?	Notes	Comment
2110	Southwest	OR 213	OR 213 / Leland Rd intersection	Add northbound through auxiliary lane	Rural Upgrade - Vehicle Capacity	Yes		#N/A
2111	Southwest	OR 99E	OR 99E / Barlow Rd intersection	Add left-turn lane on southbound Barlow Rd	Rural Upgrade - Vehicle Capacity	Yes		#N/A
U197	Southwest	Redland Rd	Redland Rd / Holly Rd intersection	Install traffic signal and westbound and southbound left-turn lanes or roundabout	Urban Upgrade - Vehicle Capacity	Yes		#N/A
U199	Southwest	Redland Rd	Redland Rd / Ferguson Rd intersection	Construct roundabout	Rural Upgrade - Vehicle Capacity	Yes		#N/A
U276	Southwest	Airport Rd	Airport Rd / Miley Rd intersection	Realign, add turn lanes, install traffic signal	Rural Upgrade - Vehicle Capacity	Yes		#N/A
U441	Southwest	OR 213	Leland Rd / Union Hall Rd intersection	Add southbound auxiliary lane	Rural Upgrade - Vehicle Capacity	Yes		#N/A
U449	Southwest	OR 99E	OR 99E / Barlow Rd intersection	Add dual left-turn lanes on southbound Barlow	Rural Upgrade - Vehicle Capacity	Yes		#N/A
U559	Southwest	I-205	Willamette River to West Linn City boundary	Add southbound truck climbing lane	Urban Upgrade - Vehicle Capacity	Yes		#N/A
2105	East	OR 212	OR 212 /282nd Ave intersection	Add second right-turn lane on 282nd	Rural Upgrade - Vehicle Capacity	Yes		#N/A
2106	East	OR 224	OR 224 /232nd Ave intersection	Install traffic signal or roundabout	Rural Upgrade - Vehicle Capacity	Yes		#N/A
U427	East	OR 224	Eaglecreek / OR 224 intersection	Install signal	Rural Upgrade - Vehicle Capacity	Yes		#N/A
2117	CRCIA	Sunnybrook Blvd	Sunnybrook Blvd / 82nd Ave intersection	Add turn lanes on all approaches	Urban Upgrade - Vehicle Capacity	No	Pending DTA analysis	#N/A
2122	CRCIA	OR 212	OR 212 / 172nd Ave intersection	Add second eastbound left-turn lane	Urban Upgrade - Vehicle Capacity	No		#N/A
U087	CRCIA	Johnson Creek Blvd	I-205 / Johnson Creek Blvd interchange	Add loop ramp and northbound on-ramp; realign southbound off-ramp	Urban Upgrade - Vehicle Capacity	No		#N/A
U131	CRCIA	Mather Rd	Mather Rd / 122nd Ave intersection	Install traffic signal or compact roundabout	Urban Upgrade - Vehicle Capacity	No		#N/A
U155	CRCIA	Strawberry Ln	Strawberry Ln / 82nd Dr intersection	Install traffic signal	Urban Upgrade - Vehicle Capacity	No		#N/A
U389	CRCIA	OR 212	OR 212 / SE 162nd Ave intersection	Add left-turn pockets and traffic signal	Urban Upgrade - Vehicle Capacity	No	Safety benefit	#N/A
U536	CRCIA	OR 212	Rock Creek Junction to Damascus	Construct climbing lane	Urban Upgrade - Vehicle Capacity	No		#N/A
U659	CRCIA	OR 213	OR 213 / Johnson Creek Blvd intersection	Extend westbound left-turn lane and rebuild median	Urban Upgrade - Vehicle Capacity	No	Safety benefit	#N/A
1039	McLoughlin	Risley Ave	Risley Ave / Trolley Trail	Pave Risley Ave across the Trolley trail	Urban Upgrade - Vehicle Capacity	No		#N/A
1067	McLoughlin	Oatfield Rd	Oatfield Rd	Provide center lane on Oatfield Rd	Urban Upgrade - Vehicle Capacity	No		#N/A
U141	McLoughlin	Oatfield Rd	Oatfield Rd / Park Rd intersection	Install traffic signal and add turn lanes	Urban Upgrade - Vehicle Capacity	No	Safety benefit	#N/A
U143	McLoughlin	Oatfield Rd	Oatfield Rd / Hill Rd intersection	Add left-turn lanes, install signal if warranted	Urban Upgrade - Vehicle Capacity	No	Safety benefit	#N/A
U144	McLoughlin	Oatfield Rd	Oatfield Rd / Concord Rd intersection	Widen, add turn lanes	Urban Upgrade - Vehicle Capacity	No	Safety benefit	#N/A
U152	McLoughlin	Webster Rd	Webster Rd / Strawberry Ln intersection	Add signal; construct westbound left-turn lane	Urban Upgrade - Vehicle Capacity	No	Safety benefit	#N/A

TSP Update ID	Geographic Area	Project Name / Street Name	Segment / Locations	Project Description	Project Category	Identified Capacity Deficiency Under 70% Growth?	Notes	Comment
1089	Southwest	Graves Rd	Ranch Hills Rd to OR 213	Realign to create four-way intersection with Mulino Road and OR 213. Install traffic signal.	Rural Upgrade - Vehicle Capacity	No		#N/A
U201	Southwest	Redland Rd	Redland Rd / Bradley Rd intersection	Install eastbound left-turn lanes	Rural Upgrade - Vehicle Capacity	No		#N/A
U265	Southwest	Beavercreek Rd	Beavercreek Rd / Leland Rd / Kamrath Rd intersection	Construct roundabout	Rural Upgrade - Vehicle Capacity	No		#N/A
U277	Southwest	Airport Rd	Arndt Rd to Miley Rd	Add turn lanes at major intersections	Rural Upgrade - Vehicle Capacity	No		#N/A
U431	Southwest	OR 211	OR 170 (Canby-Marquam Hwy) / OR 211 intersection	Install eastbound and westbound left-turn lanes, and eastbound right-turn lane; remove or decrease horizontal curve	Rural Upgrade - Vehicle Capacity	No		#N/A
U551	Southwest	OR 99E	Barlow Rd to Marion County line	Four lane widening with median, left-turn lanes from mile post 24.05	Rural Upgrade - Vehicle Capacity	No		#N/A
U520	East	US 26	Lolo Pass Rd to Govt. Camp Loop Rd. W	Widen to 4 lanes with left-turn lanes, add passing/climbing lanes and westbound right-turn lane at Lolo Pass	Rural Upgrade - Vehicle Capacity	No		#N/A
U634	East	US 26	Govt. Camp Loop W to Warm Springs Hwy	Widen to four lanes with median, add left-turn lanes, widen shoulders	Rural Upgrade - Vehicle Capacity	No		#N/A
1082	CRCIA	OR 224 (Milwaukie Expressway)	Webster Rd and 82nd Ave	Provide frontage connection on the north side of OR 244	Urban Upgrade - Vehicle Capacity	Not Studied		#N/A
1038	McLoughlin	Naef Rd	Naef Rd / Oatfield Rd connection	Open intersection of Naef Rd and Oatfield Rd to through traffic	Urban Upgrade - Vehicle Capacity	Not Studied		#N/A
U145	McLoughlin	Oatfield Rd	Oatfield Rd / McNary Rd intersection	Add southbound and eastbound left-turn lanes	Urban Upgrade - Vehicle Capacity	Not Studied		#N/A
1006	Southwest	OR 213	OR 213 / Carus Rd intersection	Install traffic signal to replace existing two-way stop	Rural Upgrade - Vehicle Capacity	Not Studied		#N/A
U189	Southwest	Hattan Rd	Hattan Rd / Gronlund Rd intersection	Install southbound right-turn lane	Rural Upgrade - Vehicle Capacity	Not Studied		#N/A
U203	Southwest	Fischers Mill Rd	Fischers Mill / Hattan Rd intersection	Reconstruct intersection; install eastbound left-turn lane	Rural Upgrade - Vehicle Capacity	Not Studied		#N/A
U204	Southwest	Redland Rd	Redland Rd / Fischers Mill Rd / Henrici Rd intersection	Install eastbound left-turn lane and east and westbound right-turn lanes at Henrici Rd	Rural Upgrade - Vehicle Capacity	Not Studied	Safety benefit	#N/A
U250	Southwest	Springwater Rd	Springwater Rd / Bakers Ferry Rd intersection	Install southbound left-turn lane; realign intersection to fix skew.	Rural Upgrade - Vehicle Capacity	Not Studied		#N/A
U295	Southwest	Canby-Marquam Highway (OR 170)	Canby-Marquam Hwy / Lone Elder Rd intersection	Reconstruct intersection; install northbound left-turn lane and southbound right-turn lane	Rural Upgrade - Vehicle Capacity	Not Studied		#N/A
U298	Southwest	OR 170 (Canby-Marquam Highway)	OR 170 / Macksburg Rd intersection	Reconstruct intersection; install southbound left-turn lane and northbound right-turn lane	Rural Upgrade - Vehicle Capacity	Not Studied		#N/A
U442	Southwest	OR 213	Carus Rd / OR 213 intersection	Install southbound left-turn and right-turn lanes	Rural Upgrade - Vehicle Capacity	Not Studied		#N/A
1011	East	US 26	US 26 / Haley Rd intersection	Install traffic signal, prohibit left-turns off US 26, install ramp over US 26 for left-turns	Rural Upgrade - Vehicle Capacity	Not Studied		#N/A

TSP Update ID	Geographic Area	Project Name / Street Name	Segment / Locations	Project Description	Project Category	Identified Capacity Deficiency Under 70% Growth?	Notes	Comment
1100	East	US 26	US 26 / Haley Rd intersection	Install traffic signal	Rural Upgrade - Vehicle Capacity	Not Studied		#N/A
U444	East	OR 224	Bakers Ferry Rd / OR 224 intersection	Add eastbound right-turn lane	Rural Upgrade - Vehicle Capacity	Not Studied		#N/A
U445	East	OR 224	Amisigger Rd / OR 224 intersection	Install traffic signal; add southbound and eastbound left-turn lanes and westbound right-turn lane	Rural Upgrade - Vehicle Capacity	Not Studied		#N/A
U446	East	OR 224	Heiple Rd / OR 224 intersection	Add southbound right-turn lane	Rural Upgrade - Vehicle Capacity	Not Studied		#N/A
U454	East	US 26	US 26 / Firwood Rd intersection	Add eastbound right-turn lane	Rural Upgrade - Vehicle Capacity	Not Studied		#N/A
U456	East	US 26	US 26 / Brightwood Loop W	Add westbound right-turn lane	Rural Upgrade - Vehicle Capacity	Not Studied		#N/A
U457	East	US 26	US 26 / Brightwood Loop E	Add westbound right-turn lane	Rural Upgrade - Vehicle Capacity	Not Studied		#N/A

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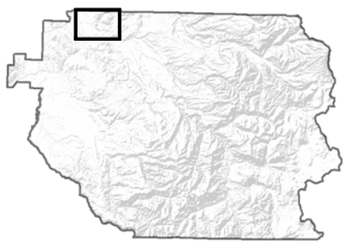

Master List Capacity Projects

Addresses 70% Deficiency?

- Yes
- No
- Not Studied

- Yes
- No
- Not Studied

Very Congested under 70% Growth

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

Congested under 70% Growth

- 1,000
- 5,000
- 10,000
- Study Intersections Failing Under 70% Growth
- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.

0 1 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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Capacity Projects and Deficient Roadways and Intersections
Greater Clackamas Regional Center / Industrial Area

Figure
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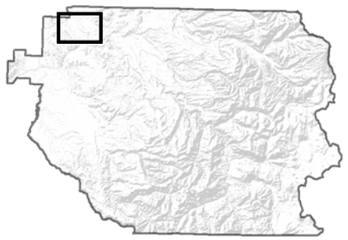
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Master List Capacity Projects

Addresses 70% Deficiency?

- Yes
- No
- Not Studied

- Yes
- No
- Not Studied

Very Congested under 70% Growth

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

Congested under 70% Growth

- 1,000
- 5,000
- 10,000
- Study Intersections Failing Under 70% Growth
- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.

0 1 Miles

Coordinate System:
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Capacity Projects and Deficient Roadways and Intersections Greater McLoughlin Area

Figure
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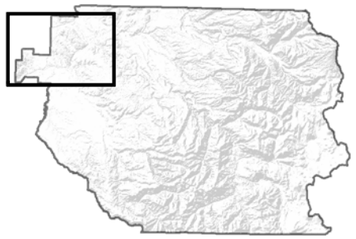
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Master List Capacity Projects

Addresses 70% Deficiency?

- Yes
- No
- Not Studied

- Yes
- No
- Not Studied

Very Congested under 70% Growth

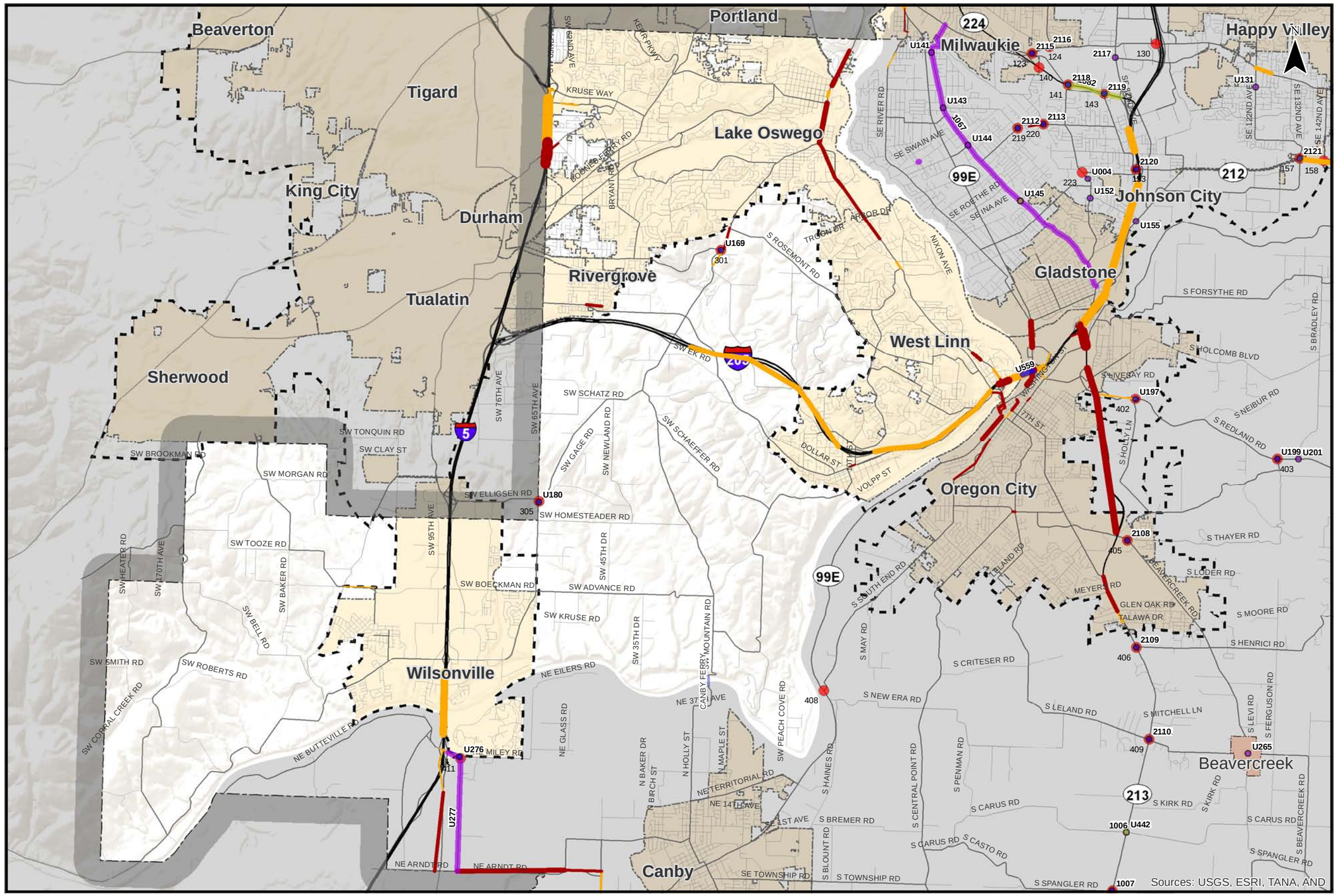
- 1,000
- 5,000
- 10,000

Congested under 70% Growth

- 1,000
- 5,000
- 10,000
- Study Intersections Failing Under 70% Growth
- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.



0 1 2 Miles

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Clackamas County, Metro Data Resouce Center

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Capacity Projects and Deficient Roadways and Intersections Northwest County

Figure
NW App D

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

Master List Capacity Projects

Addresses 70% Deficiency?

- Yes
- No
- Not Studied

- Yes
- No
- Not Studied

Very Congested under 70% Growth

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

Congested under 70% Growth

- 1,000
- 5,000
- 10,000
- Study Intersections Failing Under 70% Growth
- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.

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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Sources: USGS, ESRI, TANA, AND

Capacity Projects and Deficient Roadways and Intersections
Southwest County - Northern Portion

Figure
SN App D

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*

Master List Capacity Projects

Addresses 70% Deficiency?

- Yes
- No
- Not Studied

- Yes
- No
- Not Studied

Very Congested under 70% Growth

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

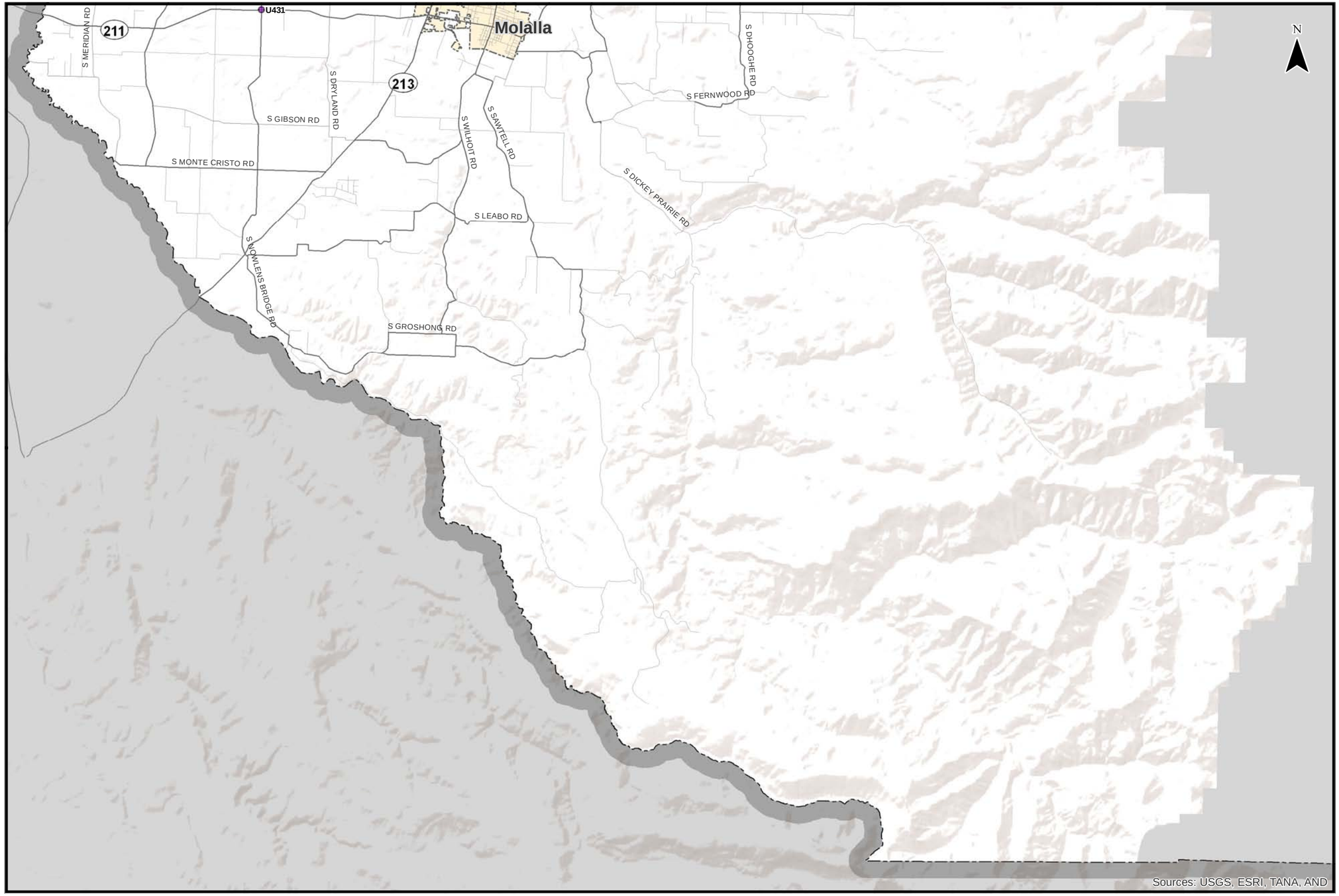
Congested under 70% Growth

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

- Study Intersections Failing Under 70% Growth
- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.



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

Capacity Projects and Deficient Roadways and Intersections
Southwest County - Southern Portion

Figure
SS App D

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CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*

Master List Capacity Projects

Addresses 70% Deficiency?

- Yes
- No
- Not Studied

- Yes
- No
- Not Studied

Very Congested under 70% Growth

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

Congested under 70% Growth

- 1,000
- 5,000
- 10,000
- Study Intersections Failing Under 70% Growth
- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.

0 1 2 3 4 5 Miles

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

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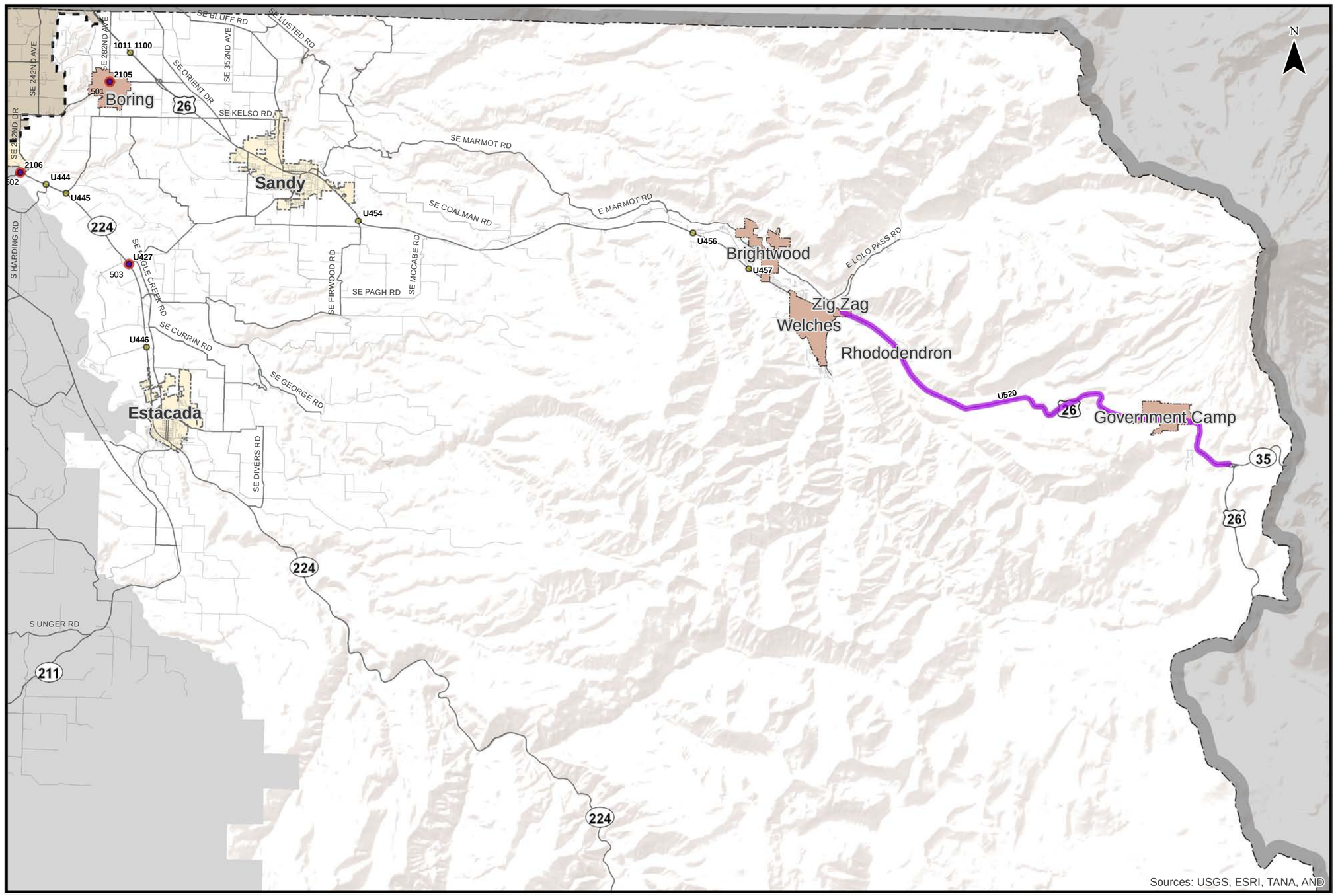


Capacity Projects and Deficient Roadways and Intersections
East County - Northern Portion

Figure
EN App D

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*

Master List Capacity Projects

Addresses 70% Deficiency?

- Yes
- No
- Not Studied

- Yes
- No
- Not Studied

Very Congested under 70% Growth

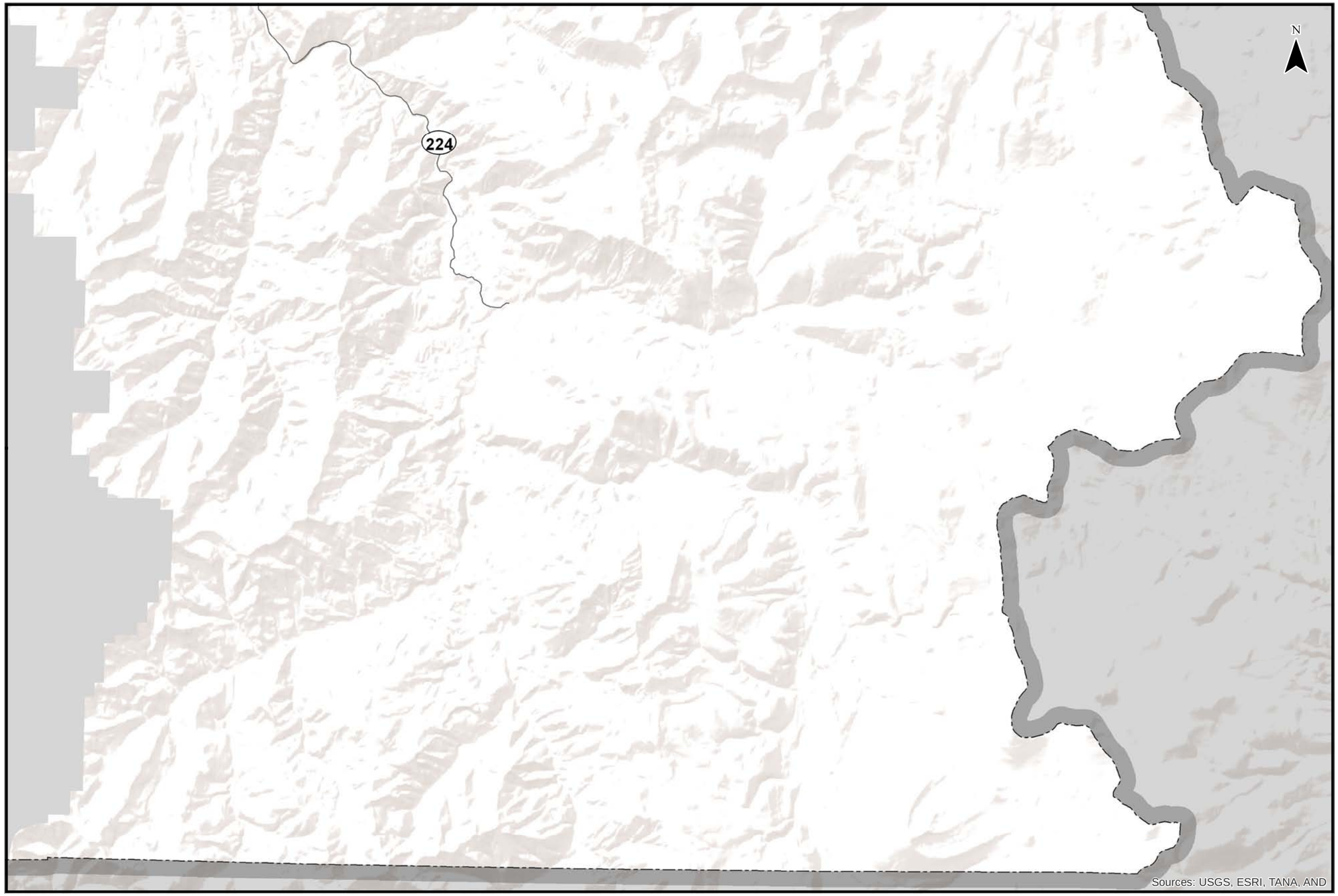
- 1,000
- 5,000
- 10,000

Congested under 70% Growth

- 1,000
- 5,000
- 10,000
- Study Intersections Failing Under 70% Growth
- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.



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

Capacity Projects and Deficient Roadways and Intersections
East County - Southern Portion

Figure
ES App D

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Appendix E Assessment of Upgrade Projects

Upgrade Projects on Master List (Appendix E)

1000 - 1999: Public Suggested Projects

2000 - 2999: New Identified Projects

U000 - U999: Previously Planned Projects

TAC: Technical Advisory Committee

GAPS: Geographic Area Projects

VOH: Virtual Open House

PAC: Public Advisory Committee

PBAC: Pedestrian and Bicycle Action Committee

TSP Update ID	Geographic Area	Project Name / Street Name	Segment / Locations	Project Description	Project Category	Identified Capacity Deficiency Under 70% Growth?	Notes	Comment
U915	CRCIA	OR 224	Rock Creek Junction to Carver Bridge	Widen to four lanes with turn lanes at intersections to Carver Bridge. Add bikeways. Add pedways over the bridge and into Carver.	Urban Upgrade	Yes		
U423	CRCIA	OR 212	SE 162nd to Anderson Rd	Add bikeways, pedways, and landscaped buffer; widen to 6 lanes within Happy Valley; add center turn lane within Damascus	Urban Upgrade	Yes	OR 212 projects to be congested between SE 162nd and SE 172nd	#N/A
U184	CRCIA	Springwater Rd	OR 224 to Hattan Rd	Widen to 3 lanes with shoulders and pedways.	Urban Upgrade	Yes		VOH: Unlikely to happen. New bridge being built for 2 lanes.PBAC: Does this project include ped/bike facilities? Is it a part of the Carver bridge project or separate
U103	CRCIA	Harmony Rd	Lake Rd / Linwood Ave / Harmony Rd intersection	Grade separated railroad crossing, include bikeways and pedways	Urban Upgrade	Yes		GAPS #2: prioritize above Harmony, Sunnybrook
U177	Northwest	Stafford Rd	I-205 to Boeckman Rd (Advance Rd)	Widen to rural major arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	Yes	Turn lanes would improve operations at SW 65th Avenue/SW Stafford Road (Int 305)	TAC #5:Ped/Bike Committee - high priorityPBAC: Important project, high priority
U168	Northwest	Stafford Rd	Rosemont Rd to I-205	Widen to rural major arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	Yes	Turn lanes would improve operations at SW Childs Road/SW Stafford Road (Int 301)	GAPS #2: VOH 2. There are 5 schools within a mile of Wankers Corner; Please do give us bike lanes to every one of these schools, for the safety and health of our children.VOH: 1. This project should receive the HIGHEST priority in the NW area - It addresses safety, peds, bikes, and commercial traffic deficiencies. The extent of the key needs is not the length defined by this labelPBAC: Important project, high priority
U531	Southwest	OR 211	Beavercreek Rd, Union Hall Rd to Dhooghe Rd	Widen to include shoulders, bikeways, add passing lanes where needed and turn lanes at major intersections	Rural Upgrade	Yes	Turn lanes would improve operations at S. Union Mills Road/S. Beavercreek Road (Int 422)	TAC #5: Road Safety Audit
U469	Southwest	Clackamas River Dr	Oregon City limits to Springwater Rd	Widen to minor arterial with pedways, bikeways, shoulders, and turn lanes at major intersections	Rural Upgrade	Yes	Turn lanes would improve operations at Clackamas River Drive/Springwater Road (Int 401)	TAC #5: Annual landslides. Hard barrier and wall prevent widening in certain locations. Look for alternative solutions to the trouble spots such as local access only and trail use. VOH: This project is not going to happen. There are multiple landslides on this route, along with steep cliffs. In some areas there is literally not 1 foot of room for widening. Maybe some strategically targeted areas are possible, but the project as a whole is not feasible.PBAC: washes out, repeated closures, close and allow peds and bikes! Important project, high priority
U302	Southwest	Union Mills Rd	OR 213 to OR 211	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	Yes	Turn lanes would improve operations at S. Union Mills Road/S. Beavercreek Road (Int 422)	TAC #5: Road Safety Audit completed for this roadway
U279	Southwest	Arndt Rd	OR 551 to Knights Bridge Rd	Widen to 4 lanes with median, left-turn lanes, shoulders and bikeways	Rural Upgrade	Yes	Forecasted to be very congested under 70% Growth Scenario	
U270	Southwest	Spangler Rd	Casto Rd to Beavercreek Rd	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	Yes	Turn lanes would improve operations at S. Spangler Road/Highway 213 (Int 418)	TAC #5: Low volumes
U214	Southwest	South End Rd	Oregon City limits to OR 99E	Widen lanes and smooth curves; add shoulders and bikeways	Rural Upgrade	Yes	Turn lanes would improve operations at South End Rd./Highway 99E (Int 408)	TAC #5: Active slide on this segmentPBAC: good project
U913	CRCIA	Hemrick Rd	172nd Ave to Foster Rd	Widen to three lanes with bikeways and pedways	Urban Upgrade	No		
U911	CRCIA	Foster Rd	Cheldelin Rd to Troge Rd	Widen to three lanes with bikeways and pedways	Urban Upgrade	No		

TSP Update ID	Geographic Area	Project Name / Street Name	Segment / Locations	Project Description	Project Category	Identified Capacity Deficiency Under 70% Growth?	Notes	Comment
U677	CRCIA	162nd Ave	Sager Rd north to County line	Add bikeways, pedways, turn lanes at major intersections, and signal at Foster Rd / 162nd Ave	Urban Upgrade	No	Foster Rd/ 162nd Ave outside of County boundary	
U580	CRCIA	OR 212	Sunrise JTA mainline to 257th Ave	Widen to 4 lanes with bike lanes, planted median and turn pockets at signalized locations.	Urban Upgrade	No	Relationship to Sunrise project?	
U394	CRCIA	OR 213	OR 213 / Harmony Rd / Sunnyside Rd intersection	Add bikeways, pedways, traffic signals and lighting	Urban Upgrade	No	Pending DTA analysis	TAC #5:Not needed if U109 is completedPBAC: What is this project?
U220	CRCIA	Tillstrom Rd	Foster Rd to 190th Dr	Widen to three lanes with bikeways and pedways. Realign at Foster Rd intersection	Urban Upgrade	No		
U156	CRCIA	82nd Dr	OR 212 to Gladstone Phase 2	Widen to 5 lane with bikeways and pedways	Urban Upgrade	No		TAC #5:Alternative to U338
U136	CRCIA	152nd Ave Phase 2	Sunnyside Rd to OR 212	Add bikeways, pedways and turn lanes at major intersections	Urban Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	GAPS #2: Why is the evaluating so different for U135? Major topography issues RESOLVED
U130	CRCIA	97th Ave / Mather Rd	Lawnfield Rd to 122nd Ave	Widen to 2 lane urban collector standard with bikeways, pedways and eastbound left-turn lanes at Mather Rd / Summers Ln and Mather Rd / 122nd Ave	Urban Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	GAPS #2: PriorityPBAC: Recommend alternative project; add bikeway and pedway facilities without capacity improvements
U128	CRCIA	172nd Ave	172nd/190th Connector to Cheldelin Rd	Widen to three lanes with bikeways and pedways.	Urban Upgrade	No		
U123	CRCIA	122nd Ave	Sunnyside Rd to Timber Valley Dr	Add bikeways and turn lanes at major intersections	Urban Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	
U109	CRCIA	OR 213	Sunnyside Rd to Sunnybrook Rd	Widen to 7 lanes with boulevard treatments	Urban Upgrade	No	Pending DTA analysis	TAC #5:Not needed if U394 is completed
U104	CRCIA	Harmony Rd	OR 213 to OR 224	Widen to 5 lanes with bikeways and pedways	Urban Upgrade	No	Widening not shown to be needed, but would ipmrove operations at SE Lake Road/SE International Way (123) and SE Harmony Road/SE Linwood Avenue (124); Pending DTA analysis	
U102	CRCIA	Lake Rd	OR 224 west to Milwaukie city limits	Add pedways and turn lanes at major intersections	Urban Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit; Pending DTA analysis	
U090	CRCIA	Otty Rd	OR 213 to 92nd Ave	Improve to minor arterial standard consistent with Fuller Road Station Plan; improve curb radius, add turn lanes, on-street parking, central median, landscaping, add bikeways and pedways	Urban Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5:Fuller Road Station Plan has cross section detailsPBAC: Recommend alternative project; add bikeway and pedway facilities without capacity improvements
U088	CRCIA	Fuller Rd	Otty St to Johnson Creek Blvd	Add pedways, turn lanes, on-street parking, central median and landscaping.	Urban Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5:Fuller Road Station Plan has cross section detailsPBAC: Change from JCB to Co Line; remove U797 (Does this conflict with Fuller Rd plan? - SJA)
U075	CRCIA	Clatsop St / Luther Rd	72nd Ave to Fuller Rd	Upgrade to 3-lane collector standard add signal at OR 213 intersection; add bikeways and pedways	Urban Upgrade	No		

TSP Update ID	Geographic Area	Project Name / Street Name	Segment / Locations	Project Description	Project Category	Identified Capacity Deficiency Under 70% Growth?	Notes	Comment
U074	CRCIA	Johnson Creek Blvd	Bell Ave to OR 213	Widen to 3 lanes from Bell Ave to 76th Ave and 5 lanes from 76th Ave to 82nd Ave with bikeways and pedways	Urban Upgrade	No		PBAC: Recommend alternative project; add bikeway and pedway facilities without capacity improvements
U072	CRCIA	Johnson Creek Blvd	55th Ave to Bell Ave	Widen to 3 lanes with bikeways and pedways	Urban Upgrade	No		PBAC: Recommend alternative project; add bikeway and pedway facilities without capacity improvements
U058	CRCIA	132nd Ave	Sunnyside Rd to OR 212	Add bikeways, pedways, traffic calming and turn lanes at major intersections	Urban Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	PBAC: Support project but too expensive and may never happen so recommend alternative project; add pedway facilities on east side of street (west side will have sidewalks funded through TE grant); if not part of another project add bikeways on both sides of the
U057	CRCIA	122nd Ave	Sunnyside Rd to Hubbard Rd	Add bikeways, pedways, traffic calming and turn lanes at major intersections	Urban Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	GAPS #2: Existing sidewalks on the west side of 122ndPBAC: Support project but too expensive and may never happen so recommend alternative project; add pedway facilities on east side of street (west side will have sidewalks funded through TE grant); if not part of another project add bikeways on both sides of the street if there are none (maybe can get consistent biekways in some areas through restriping)
U003	CRCIA	172nd Ave	Sunnyside Rd to 172nd/190th Connector	Widen to five lanes with bikeways and pedways	Urban Upgrade	No		
U635	East	US 26	OR 35 Junction to Wasco County line	Widen roadway to include bikeways /shoulders, add passing lanes where needed and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	PBAC: Important improvement, high priority
U532	East	OR 211	Hayden Rd to OR 224	Widen to rural arterial standard with shoulders, bikeways and turn lanes at major intersections.	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	
U502	East	Firwood Rd	Wildcat Mountain Dr to US 26	Widen to rural arterial standard (2 lanes) with shoulders, bikeways and turn lanes at major intersections.	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5:Physical constraints, not feasible along entire segment
U495	East	Bull Run Rd	Ten Eyck Rd to Multnomah County line	Widen to rural arterial standard (2 lanes) with shoulders, bikeways and turn lanes at major intersections.	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	
U258	East	Coupland Rd	Edgehill Dr to Divers Rd	Widen to rural minor arterial standard (2 lanes) with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5: Ped/Bike Committee - low priority
U257	East	Eagle Creek Rd	Currin Rd to Duus Rd	Remove horizontal curve, relocate intersection, widen to rural arterial standard (2 lanes) with shoulders, bikeways and turn lanes at major intersections; investigate speed zone south of Currin Road	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	
U254	East	Hayden Rd	Springwater Rd to OR 211	Widen to rural arterial standard (2 lanes) with shoulders, bikeways and turn lanes at major intersections.	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5: Ped/Bike Committee - physically not feasible, low priority
U237	East	Ten Eyck Rd	Lusted Rd to US 26	Remove vertical curve, relocate intersection, widen to rural arterial standard (2 lanes) with shoulders and bikeways, turn lanes at major intersections; investigate speed zone	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5: Physical constraints, low priority

TSP Update ID	Geographic Area	Project Name / Street Name	Segment / Locations	Project Description	Project Category	Identified Capacity Deficiency Under 70% Growth?	Notes	Comment
U233	East	Kelso Rd	Orient Dr to Sandy UGB	Remove vertical curve, relocate intersection, widen to rural arterial standard (2 lanes) with shoulders, bikeways and turn lanes at major intersections; investigate speed zone	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	PAC4B: Combine with U232, overlap with U753 (Ben)
U232	East	Kelso Rd	Richey Rd to Orient Dr	Widen to rural arterial standard (2 lanes) with shoulders, bikeways and turn lanes at major intersections.	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	PAC4B: Combine with U233, overlap with U753 (Ben)
U231	East	Amisigger Rd	OR 224 to Kelso / Richey Rd	Widen to rural arterial standard (2 lanes) with shoulders and bikeways and turn lanes at major intersections; smooth curves.	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	
U229	East	Richey Rd	Kelso Rd to OR 212	Widen to rural arterial standard (2 lanes) with shoulders, bikeways and turn lanes at major intersections.	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	GAPS #2: Expensive: Right of way needed
U140	McLoughlin	Concord Rd	River Rd to Oatfield Rd	Reconstruct and widen (2 lanes) with pedway and bikeway infill; add turn lanes at major intersections	Urban Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	
U702	Northwest	Carman	Lake Oswego City Limits to I-5	Widen to two lane County standard and analyze for turn lanes; add bikeways and pedways	Urban Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	
U466	Northwest	Petes Mountain Rd	Willamette Falls Rd to Hoffman Rd	Widen to rural minor arterial standard with bikeways, shoulders and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5:Ped/Bike Committee - low priorityGAPS #2: Terrible bike ride because of elevation. Adding bike lanes may not make sense because it wouldn't increase bike ridership.
U462	Northwest	Childs Rd	Stafford Rd to 65th Ave	Reconstruct and widen to 3 lanes; add bikeways	Urban Upgrade	No		
U272	Northwest	Ladd Hill Rd	Wilsonville Rd to Washington County line	Widen to rural minor arterial standard with bikeways, shoulders and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5:Ped/Bike Committee - multi-use path may be a better option
U173	Northwest	Rosemont Rd	Stafford Rd to Salamo Rd	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5:Ped/Bike Committee - low priority
U167	Northwest	Borland Rd	65th Ave to Stafford Rd	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5:Ped/Bike Committee - high priority GAPS #2: Modify extent to outside of city VOH: Yes, this area is destined for mixed commercial/residential development, and should receive high priority!
U529	Southwest	OR 211	Marion County line to OR 170 (Canby-Marquam Hwy)	Widen to include shoulders, bikeways, add passing lanes where needed and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5: Road Safety Audit
U503	Southwest	Mattoon Rd	Fischers Mill Rd to Redland Rd	Widen to rural collector with shoulder / bikeway and turn lanes at major intersections. Remove vertical curves, remove horizontal curves north of Redland Rd	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	
U475	Southwest	Henrici Rd	Beavercreek Rd to Redland Rd	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections. Remove horizontal and vertical curves, investigate 40 mph speed zone extension to east of Ferguson Rd	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5: Analyze for fiscally responsible and sustainable. Related to U206
U473	Southwest	Holcomb Blvd	Edenwild Ln to Bradley Rd	Widen to standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	

TSP Update ID	Geographic Area	Project Name / Street Name	Segment / Locations	Project Description	Project Category	Identified Capacity Deficiency Under 70% Growth?	Notes	Comment
U326	Southwest	Maple Grove Rd	Nowlens Bridge Rd to Sawtell Rd	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	#N/A
U325	Southwest	Bird Rd	Groshong Rd to Wilhoit Rd	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5: Low volumes. Ped / Bike Committee okay with removing bikeways. GAPS #2: Why keep if removing U324PAC4B: Low use roadways, therefore not a priority. Consider removing.
U323	Southwest	Blair Rd	Groshong Rd to Maple Grove Rd	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5: Low volumes. Ped / Bike Committee okay with removing bikeways. GAPS #2: Why keep if removing U324PAC4B: Low use roadways, therefore not a priority. Consider removing.
U322	Southwest	Nowlens Bridge Rd	OR 213 to Maple Grove Rd	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5: Low volumes. Ped / Bike Committee okay with removing bikeways. PAC4B: Low use roadways, therefore not a priority. Consider removing.
U321	Southwest	Wildcat Rd	Wilhoit Rd to OR 213	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	PAC4B: Low use roadways, therefore not a priority. Consider removing.
U320	Southwest	Sawtell Rd	Maple Grove Rd to Wilhoit Rd	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	PAC4B: Low use roadways, therefore not a priority. Consider removing.
U317	Southwest	Dhooghe Rd	OR 211 to Fernwood Rd	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	
U316	Southwest	Fernwood Rd	Dhooghe Rd to Callahan Rd	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5: Low volumes
U315	Southwest	Callahan Rd S (beginning on Ramsby Rd)	Dickie Prairie Rd to Fernwood Rd	Widen to rural collector standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5: Low volumes
U311	Southwest	Molalla Ave / Vaughan Rd	OR 213 to Molalla City limits	Bring section up to County standards for rural minor arterial with shoulders and bikeways	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	VOH: Include improvements to prevent flooding.
U300	Southwest	Macksburg Rd	OR 170 (Canby Marquam Hwy) to OR 213	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	
U299	Southwest	Dryland Rd	Macksburg Rd S to Macksburg Rd N	Realign to form one intersection at Dryland Rd	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	
U290	Southwest	Township Rd	Central Point Rd to Canby City limit	Widen to rural major arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5: Ped / Bike Committee okay with removing bikeways
U269	Southwest	Casto Rd	Spangler Rd to Central Point Rd	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections.	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5: Low volumes, steep road, low priority. Ped / Bike Committee okay with removing bikeway.
U264	Southwest	Unger Rd	Beavercreek Rd to OR 211	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5: Low bike volume. Gravel shoulders only?
U263	Southwest	Lower Highland Rd	Beavercreek Rd to Fellows Rd	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	
U262	Southwest	Redland Rd	Henrici Rd to Springwater Rd	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5: Road Safety AuditPBAC: good project
U260	Southwest	Fellows Rd	Redland Rd to Lower Highland Rd	Widen to rural arterial standard (2 lanes) with shoulders, bikeways and turn lanes at major intersections.	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5: Physically challenging, low volumes

TSP Update ID	Geographic Area	Project Name / Street Name	Segment / Locations	Project Description	Project Category	Identified Capacity Deficiency Under 70% Growth?	Notes	Comment
U249	Southwest	Springwater Rd	Hattan Rd to Hayden Rd	Widen to rural arterial standard (2 lanes) with shoulders, bikeways and turn lanes at major intersections.	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5: Physical constraints, costly
U247	Southwest	Bakers Ferry Rd	Springwater Rd to OR 224	Widen to rural arterial standard (2 lanes) with shoulders, bikeways and turn lanes at major intersections; remove horizontal curve and relocate intersection from Faden Rd to OR 224	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	
U211	Southwest	Beavercreek Rd	Henrici Rd to Yeoman Rd/Steiner Rd	Bring up to County standards; widen to include shoulders, bikeways, pedways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	GAP 3 #2: Priority PAC4B: ADD to Steiner/ Yeoman at the elemantary school of the Fire Department a bit further. This covers the main core of the community. (Elizabeth) U739 covers, so adjusted boundaries of U739 accordingly.
U210	Southwest	Henrici Rd	OR 213 to Beavercreek Rd	Widen to rural minor arterial standard with shoulders, shoulders bikeways and turn lanes at major intersections.	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	
U194	Southwest	Bradley Rd	Redland Rd to Holcomb Blvd	Widen to rural collector standard with shoulders, bikeways and turn lanes at major intersections	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	
U190	Southwest	Hattan Rd	Fischers Mill Rd to Gronlund Rd	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections.	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	
U188	Southwest	Gronlund Rd / Hattan Rd	Bradley Rd to Springwater Rd	Widen to rural minor arterial standard with shoulders, bikeways and turn lanes at major intersections.	Rural Upgrade	No	Turn lanes not shown to be needed for capacity, but provide safety benefit.	TAC #5: Reoccuring slide, this may not be fiscally responsible. Ped / Bike Committee okay to remove bikeways. Separate out project from Gronlund to Hattan.
U186	Southwest	Forsythe Rd	Oregon City to Bradley Rd	Widen to 3 lanes; add shoulders and bikeways	Rural Upgrade	No		

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

Master List Upgrade Projects

Addresses 70% Deficiency?

- Yes
- No

- Yes
- No

Very Congested under 70% Growth

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

Congested under 70% Growth

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

- Study Intersections Failing Under 70% Growth
- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.

0 1 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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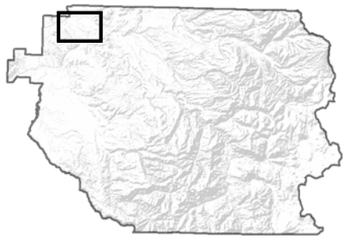
Upgrade Projects and Deficient Roadways and Intersections
Greater Clackamas Regional Center / Industrial Area

Figure
C App E

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Master List Upgrade Projects

Addresses 70% Deficiency?

- Yes
- No

- Yes
- No

Very Congested under 70% Growth

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

Congested under 70% Growth

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

- Study Intersections Failing Under 70% Growth
- Incorporated Areas
- County Boundary
- UGB

Note:
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Congested: roadway v/c ratio is between 1.0 and 1.1.

0 1 Miles

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Upgrade Projects and Deficient Roadways and Intersections Greater McLoughlin Area

Figure
M App E

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

Master List Upgrade Projects

Addresses 70% Deficiency?

- Yes
- No

- Yes
- No

Very Congested under 70% Growth

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

Congested under 70% Growth

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

- Study Intersections Failing Under 70% Growth
- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.

0 1 2 Miles

Coordinate System:
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Upgrade Projects and Deficient Roadways and Intersections Northwest County

Figure
NW App E

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*

Master List Upgrade Projects

Addresses 70% Deficiency?

- Yes
- No

- Yes
- No

Very Congested under 70% Growth

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

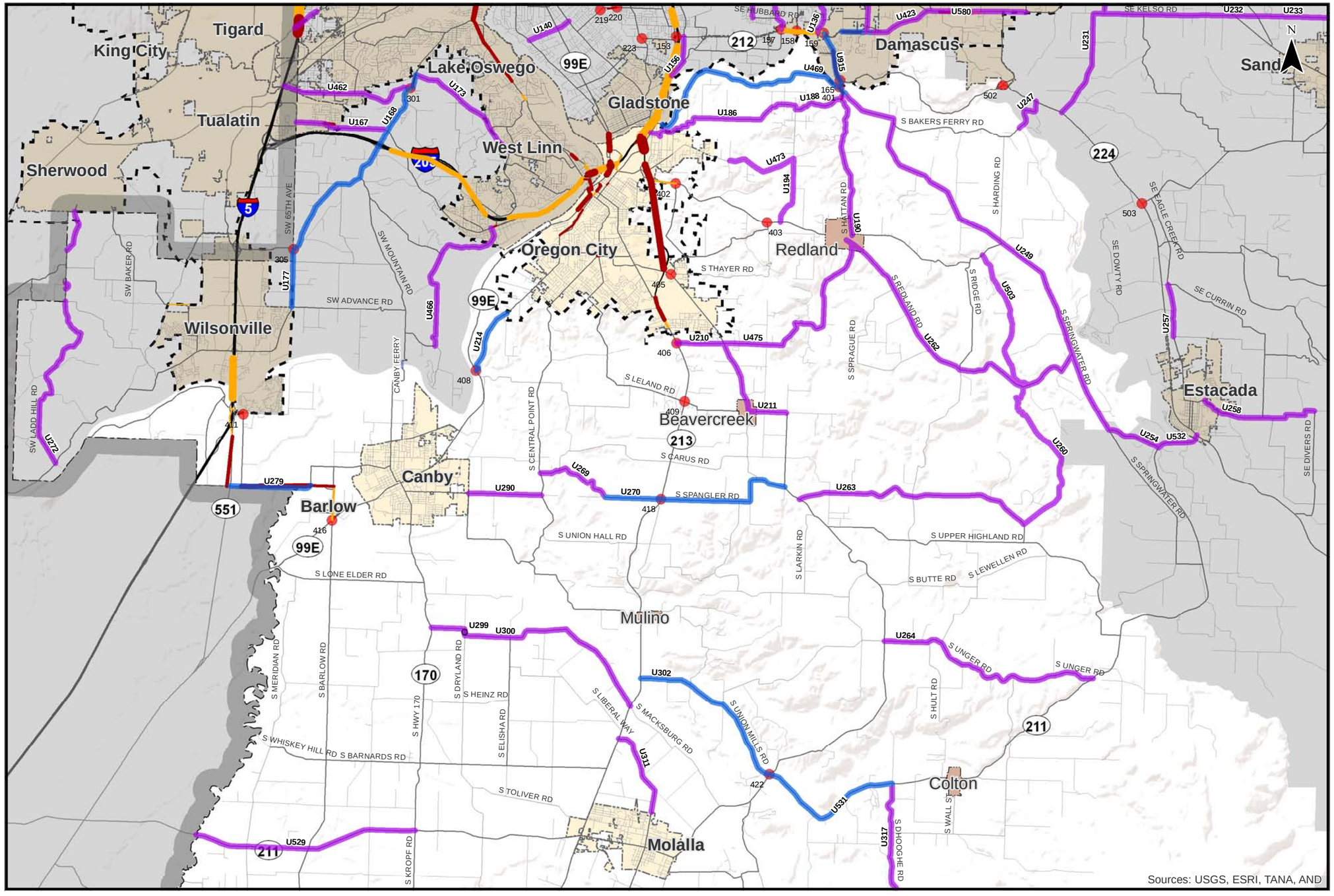
Congested under 70% Growth

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

- Study Intersections Failing Under 70% Growth
- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.



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

Upgrade Projects and Deficient Roadways and Intersections
Southwest County - Northern Portion

Figure
SN App E

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CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

Master List Upgrade Projects

Addresses 70% Deficiency?

- Yes
- No

- Yes
- No

Very Congested under 70% Growth

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

Congested under 70% Growth

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

- Study Intersections Failing Under 70% Growth
- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

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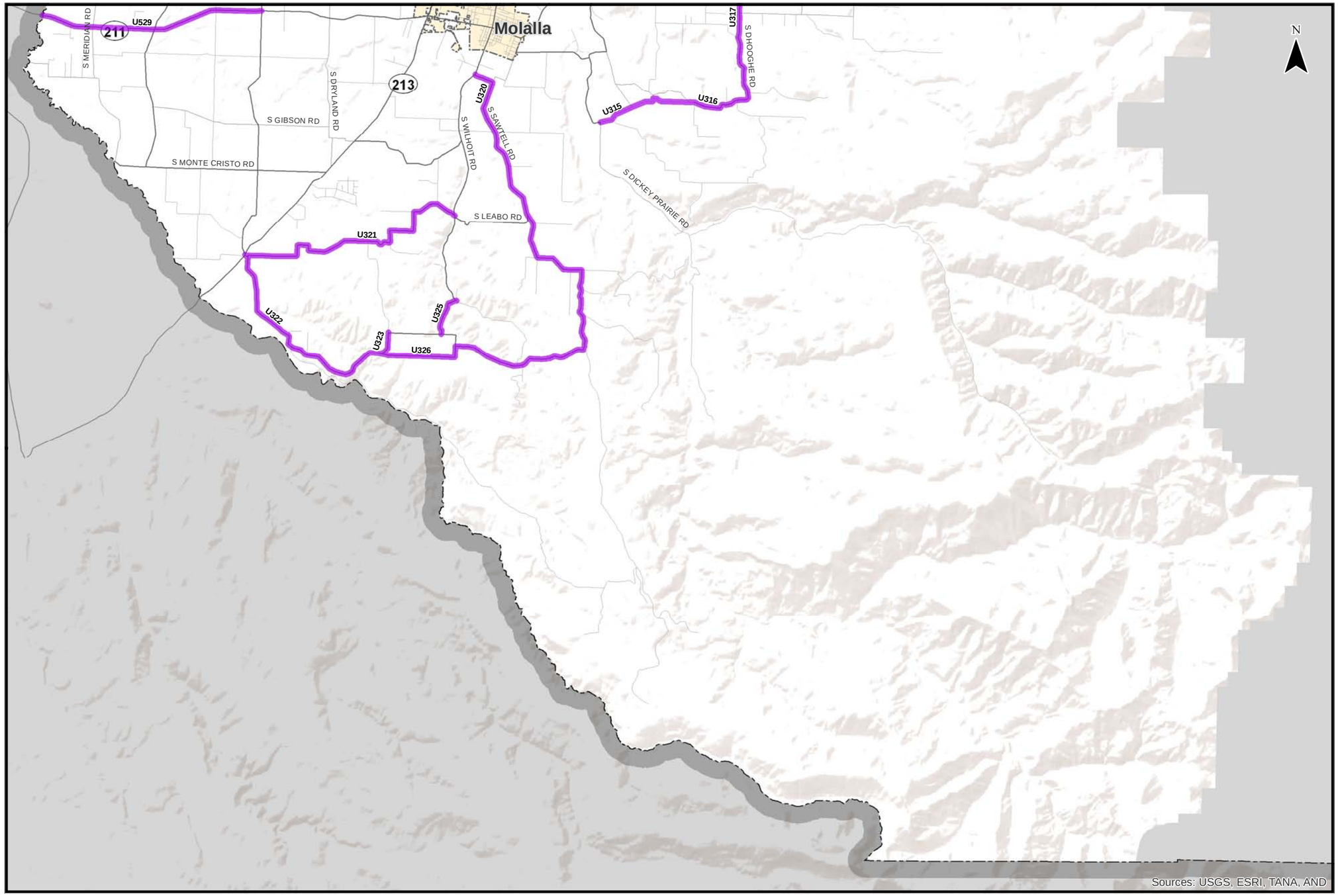

0 1 2 3 4 Miles

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

Upgrade Projects and Deficient Roadways and Intersections
Southwest County - Southern Portion

Figure
SS App E

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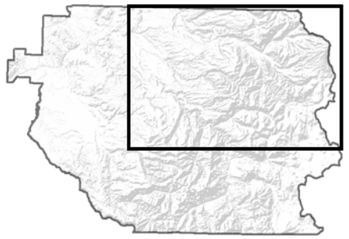
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Master List Upgrade Projects

Addresses 70% Deficiency?

- Yes
- No

- Yes
- No

Very Congested under 70% Growth

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

Congested under 70% Growth

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

- Study Intersections Failing Under 70% Growth
- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.

0 1 2 3 4 5 Miles

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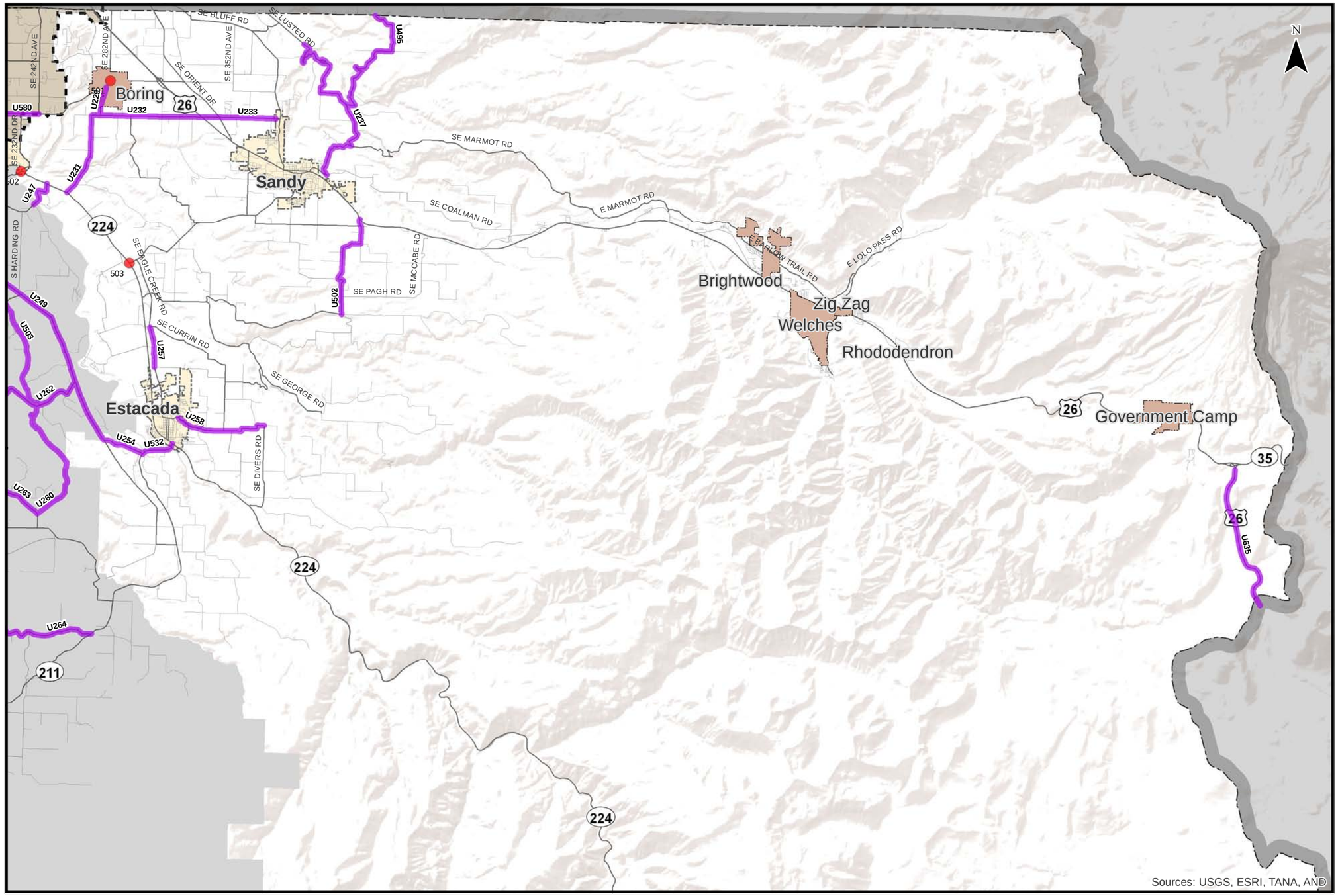


Upgrade Projects and Deficient Roadways and Intersections
East County - Northern Portion

Figure
EN App E

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*

Master List Upgrade Projects

Addresses 70% Deficiency?

- Yes
- No

- Yes
- No

Very Congested under 70% Growth

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

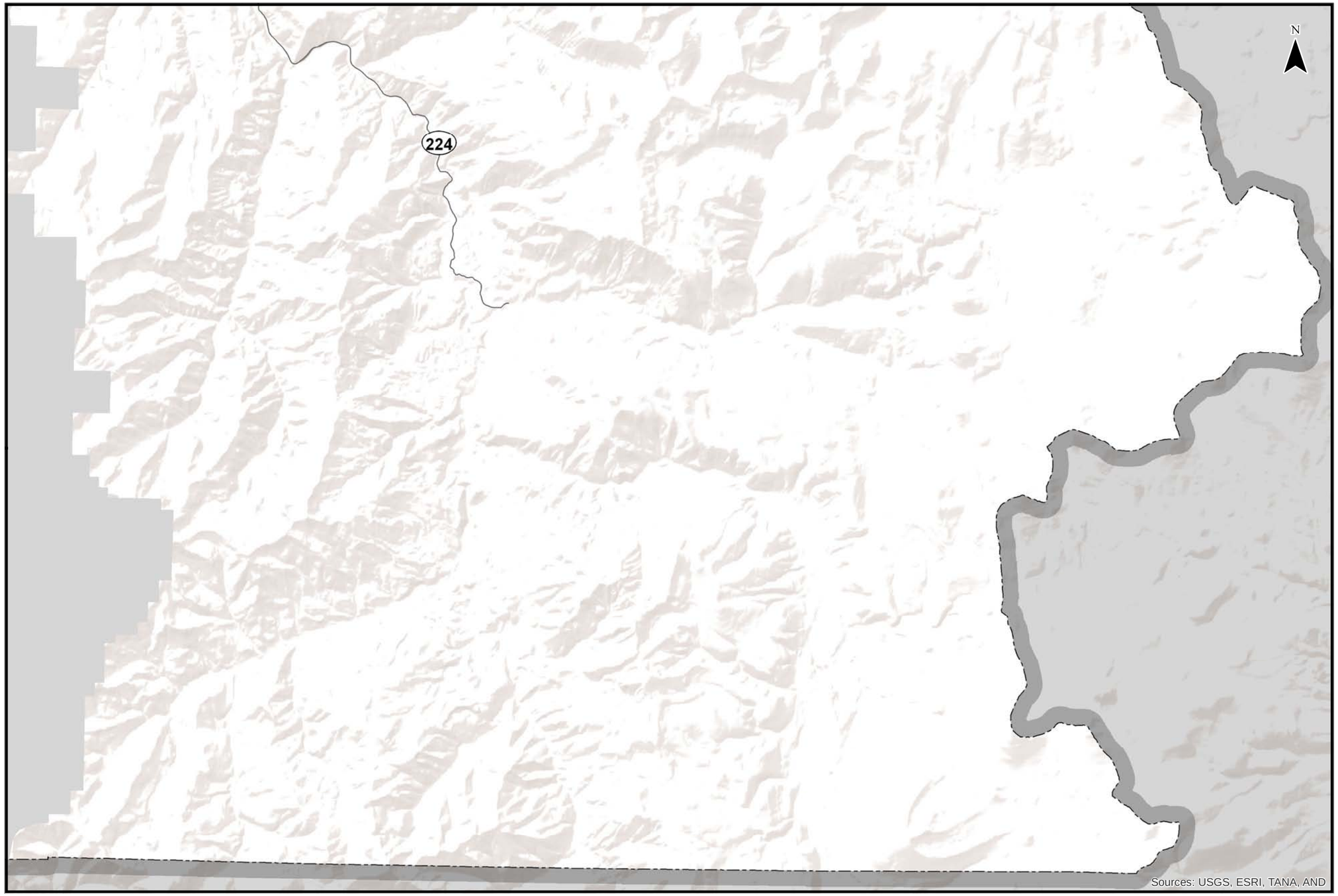
Congested under 70% Growth

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

- Study Intersections Failing Under 70% Growth
- Incorporated Areas
- County Boundary
- UGB

Note:
Very Congested: roadway v/c ratio is greater than 1.1.

Congested: roadway v/c ratio is between 1.0 and 1.1.



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

Upgrade Projects and Deficient Roadways and Intersections
East County - Southern Portion

Figure
ES App E

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