



## City of Medford Transportation System Plan and Urban Growth Boundary Amendment



# DRAFT Technical Memorandum #7: Future Land Use

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**Date:** June 25, 2013

Project #: 10771

**To:** Alex Georgevitch, City of Medford

**From:** Joe Bessman, Julia Kuhn, and Matt Kittelson

**Project:** City of Medford TSP/UGB Amendment

**Subject:** Interim Year 2028 Updated Planning Horizon Analysis

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The purpose of this memorandum is to document the population and employment assumptions used to develop UGB scenarios in Medford as part of the TSP Update/UGB Amendment process. These assumptions are based on consolidated information provided by ODOT's Transportation Planning Analysis Unit, the Rogue Valley Council of Governments (RVCOG), and from City of Medford staff.

## **BACKGROUND**

As part of the TSP update, the City of Medford is basing the 20-year recommended transportation projects assuming the coordinated population and employment forecast from Jackson County and RVCOG. An expansion to the existing UGB is needed to accommodate the level of growth in households and jobs anticipated during the next twenty years. The UGB is projected to reach its capacity to serve future land use growth by 2028. To meet state land use requirements and to ensure compliance with the Regional Transportation Plan (RTP), the City needs to identify ways to accommodate land use growth through the year 2034. To do this, the City is considering both intensification of zoning within the UGB (which won't address all of the need) and a variety of geographic areas for the UGB expansion.

## **POPULATION AND HOUSEHOLD GROWTH**

As part of the transportation analysis of UGB expansion scenarios, we needed to ensure consistency between the coordinated population forecast and the city's forecast growth in housing units from their buildable lands analysis. We worked with city staff to translate the forecast housing growth to population estimates. The methodology used for this conversion was based on the following:

- Dwelling units per acre were calculated for each residential zoning type based on average densities in the City, as documented in the Housing Element of Comprehensive Plan.
- The Housing Element also provided guidance on average persons per household by household type.

- The amount of additional population growth included in the coordinated forecast that needs to be served by the UGB expansion was calculated using the persons per household estimates. The additional population growth needed external to the UGB was converted to households.
- Residential zoning in the urban growth boundary expansion areas (referred to as External Study Area (ESA) lands) was assumed to be consistent with the Housing Element, including: 60% Urban, 10% Urban Medium, and 30% Urban High density designations.
- Household dwelling units were geographically distributed amongst the residentially-zoned External Study Area (ESA) lands based on a buildable lands analysis. Given the variety of expansion areas considered, this results in a different level of geographic distribution of future households in each scenario. We provided ODOT with estimates of growth by Transportation Analysis Zones (TAZ) for each scenario under consideration.

## **EMPLOYMENT**

The Economic Element of the City's Comprehensive Plan outlines the anticipated growth in jobs by sector (e.g., agricultural, construction, service, retail, government, etc.). This information was used to identify the number of jobs, by type, that could occur in the geographic areas under consideration, using the following methodology:

- The City's Economic Element was used to estimate the number of jobs, by sector, that need to be accommodated outside the UGB.
- The ESA lands under consideration have different capacities for sector employment growth. The growth in jobs by sector were assigned geographically recognizing the varying levels of potential capacity for growth.
- We provided estimates of growth in jobs, by sector, aggregated to the TAZ boundaries for ODOT for use in the travel demand model.

## **ROLE OF INTERNAL STUDY AREAS**

Prior to expanding the UGB, the City needs to identify feasible options for intensify lands within the existing UGB. For analysis purposes, these lands are referred to as Internal Study Areas (ISAs). The city assumed that 60 percent of the ISA lands under consideration would be rezoned and the remainder would be considered infeasible for intensification. This intensification only accounts for part of the anticipated growth in households and employment. Under any scenario, expansion of the UGB is needed to accommodate year 2034 land use growth.

## RESULTING LANDS

A summary of the lands needed to support the growth in households and employment is summarized in Table 1. A summary of the geographical distribution of lands being considered for each scenario is shown in Exhibits 1 through 4.

**Table 1. UGB Expansion Land Needs (provided in acres)**

Scenario	Total area	Residential	Employment		Open Space
			Commercial	Industrial	
Scenario 1	3,814	1,081	423	424	1,886
Scenario 2	4,035	1,664	395	89	1,886
Scenario 3	3,846	1,520	411	29	1,886
Baseline Scenario	4,719	1,908	896	29	1,886

Please let us know if you have any questions or comments on this process. Additional information on incorporating growth into the ODOT Travel Demand Model is summarized within the attachments.

Attachments:

- May 1, 2013 Model Report Memorandum from Tara Weidner

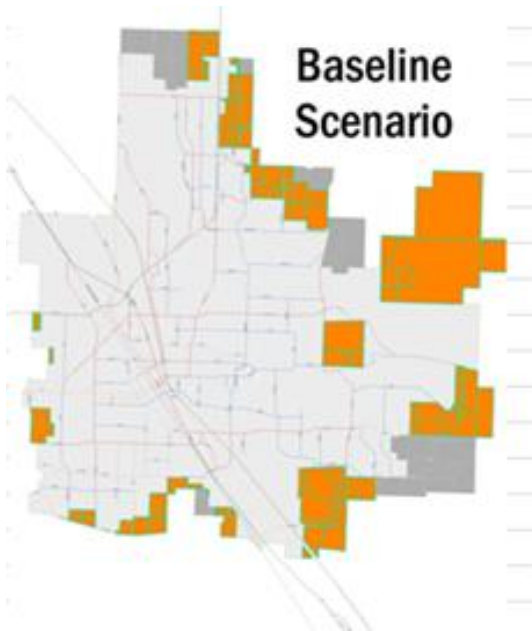


Exhibit 1. Baseline scenario assumes all Medford growth occurs outside of the current UGB with no internal upzoning.

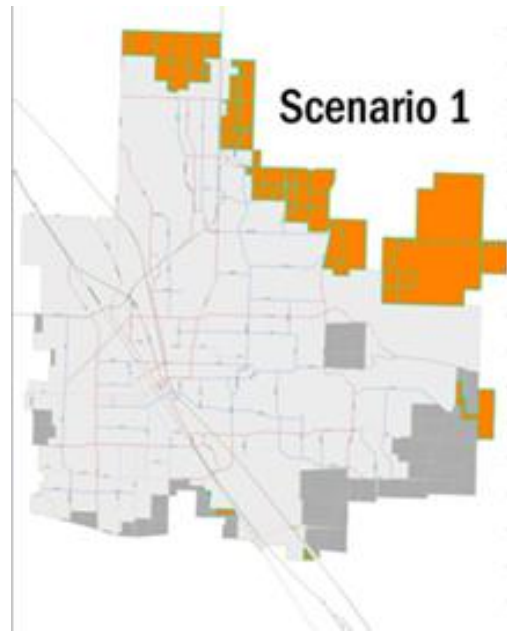


Exhibit 2. Includes internal upzoning and expansion of the UGB to the northeast.

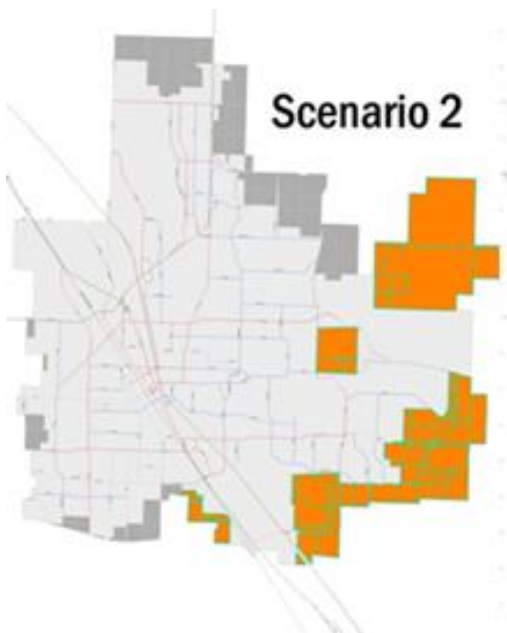


Exhibit 3. Includes internal upzoning and expansion of the UGB to the southeast and in limited portions of the southwest.

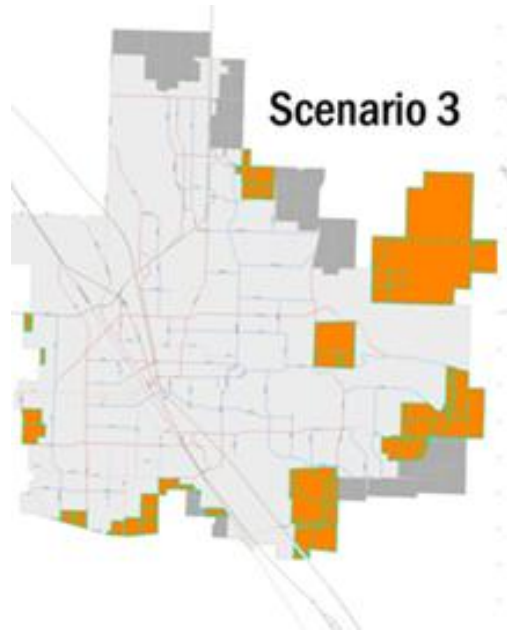


Exhibit 4. Includes internal upzoning and expansion of the UGB to the east and limited portions in the southwest.



# State of Oregon

Date: May 1, 2013

To: Joe Bessman, Kittleson & Associates

From: Tara Weidner, P.E., Senior Transportation Modeler  
ODOT Transportation Planning Analysis Unit (TPAU)

Cc: John Adams, City of Medford  
Brian Dunn, ODOT TPAU  
Peter Schuytema, ODOT Transportation Planning Analysis Unit  
Ian Horlacher, ODOT Region 4

RE: **Model Request for Medford ESA Scenarios (Internal Request #39)**

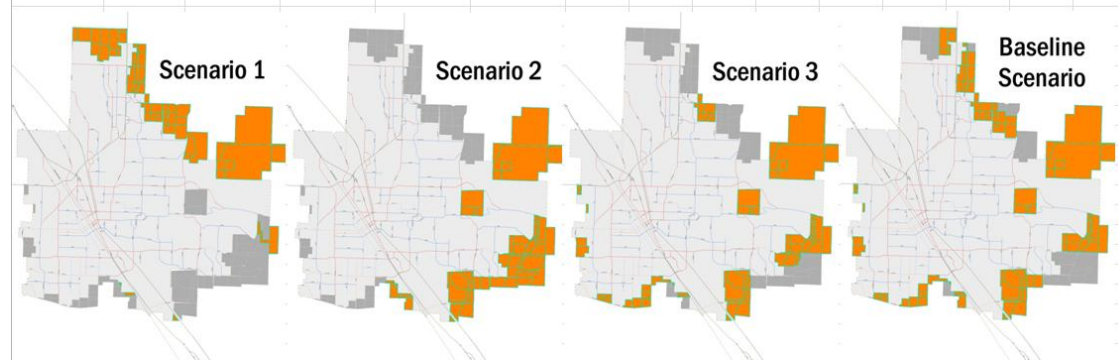
## Brief Description

A model request was submitted by Kittleson & Associates to utilize the Rogue Valley MPO Travel Demand Model (RVMPO). The purpose of the project was to investigate a number of possible futures for the growth of population and employment in the urban reserve areas of Medford.<sup>1</sup> It is a screening exercise to better understand the travel impacts of the alternative scenarios as shown below.

The city developed a baseline of boundary expansion choices based on various public inputs. In order to comprehensively evaluate impacts on the transportation system, staff has developed three alternative expansion scenarios out of the baseline areas, each of which is similar in extent to the city's 20-year land need.

Table. Summary of Land Use types in the three scenarios and the baseline (acres)

	Total area	Residential	Employment		
			Commercial	Industrial	Open Space
Scenario 1	3,814	1,081	423	424	1,886
Scenario 2	4,035	1,664	395	89	1,886
Scenario 3	3,846	1,520	411	29	1,886
Baseline	4,719	1,908	896	29	1,886



Source: ESA\_2034\_TAZ\_worksheet\_Final.xlsx, Summary" sheet. (Kittleson & Associates)

<sup>1</sup> Note that travel models provide only generalized travel forecasts because they are based on generalized land use patterns and transportation networks. Since models do not represent individual land uses, driveways or neighborhood-scale streets, the forecasts produced are not sensitive to these specific land use and transportation characteristics.

It is inappropriate to use raw model outputs as the basis for transportation and land use decisions that require consideration of detailed transportation and land use characteristics. Therefore, post-processing of model outputs to account for the influence of specific transportation and land use characteristics is mandatory. Methods used for post-processing must conform to specifications provided within the ODOT Analysis Procedures Manual ([http://www.oregon.gov/ODOT/TD/TP/TAPM.shtml#Analysis\\_Procedures\\_Manual](http://www.oregon.gov/ODOT/TD/TP/TAPM.shtml#Analysis_Procedures_Manual)).

## Land Use & Network Assumptions

The decision was made to use the RVMPO v2 model, as this was a screening exercise, the prior work had been done under v2, and the RVMPOv3 was not yet complete. The 2028 network was used (same as used in prior Medford TSP analysis),<sup>2</sup> as only minor changes were assumed in v2 between 2028 and 2034, none with any significant impact to Medford. It should be noted that this network differs from the v3PROD 2038 network in the Hwy62 configuration, although both are similar partial builds (as opposed to the v3AQ 2038 which included the full build which is unfunded).

The decision was made to use the RVMPO v2 2028 base land use<sup>3</sup> as a starting point. The consultant provided four alternative futures bringing the activity to a 2034 year, by adding the same number of population and employment. These scenarios include a base case, and then reallocating population and employment in 34 zones for the 3 alternative scenarios. The table below identifies the HH and employment values for all scenarios in these zones, as well as the difference relative to the base scenario.

Medford ESA Scenarios		Households by Scenario				Employment by Scenario				HHs vs. Base			EMP vs. Base		
TAZ	JURISDICTI	base HH	01_HH	02_HH	03_HH	base_Emp	01_Emp	02_Emp	03_Emp	01_HH	02_HH	03_HH	01_Emp	02_Emp	03_Emp
168	Medford	0	0	0	0	764	2782	764	764	0	0	0	2018	0	0
169	Medford	12	12	12	12	3808	8557	939	939	0	0	0	4749	-2869	-2869
177	Medford	152	437	1	1	1628	1700	823	823	285	-151	-151	72	-805	-805
188	Rural Jackson Co	84	1697	84	84	131	131	131	131	1613	0	0	0	0	0
190	Rural Jackson Co	772	1942	15	15	443	483	6	6	1170	-757	-757	40	-437	-437
193	Medford	950	1080	778	854	115	126	3	3	130	-172	-96	11	-112	-112
194	Medford	197	331	21	21	2245	2418	373	373	134	-176	-176	173	-1872	-1872
195	Medford	952	971	926	958	445	445	445	445	19	-26	6	0	0	0
196	Rural Jackson Co	427	751	6	536	287	312	0	600	324	-421	109	25	-287	313
294	Rural Jackson Co	41	1	1	52	17	17	17	17	-40	-40	11	0	0	0
295	Medford	548	524	524	554	3	3	3	3	-24	-24	6	0	0	0
296	Medford	234	204	204	241	306	306	306	306	-30	-30	7	0	0	0
412	Rural Jackson Co	631	6	723	791	1010	44	1885	2073	-625	92	160	-966	875	1063
414	Rural Jackson Co	245	429	6	155	0	0	0	0	184	-239	-90	0	0	0
416	Rural Jackson Co	474	15	622	591	9	9	9	9	-459	148	117	0	0	0
418	Rural Jackson Co	7	7	853	63	13	13	13	13	0	846	56	0	0	0
419	Rural Jackson Co	25	25	677	25	0	0	0	0	0	652	0	0	0	0
420	Rural Jackson Co	176	5	201	5	591	31	1100	31	-171	25	-171	-560	509	-560
422	Rural Jackson Co	15	15	862	483	4	4	4	4	0	847	468	0	0	0
424	Medford	1622	1563	1631	1638	199	43	338	368	-59	9	16	-156	139	169
443	Rural Jackson Co	973	10	1114	1218	1456	198	2597	2841	-963	141	245	-1258	1141	1385
449	Rural Jackson Co	6	6	6	6	821	175	1775	337	0	0	0	-646	954	-484
450	Rural Jackson Co	28	28	28	28	0	0	1208	0	0	0	0	0	1208	0
451	Rural Jackson Co	6	6	6	6	830	97	709	1640	0	0	0	-733	-121	810
452	Medford	1	1	1	1	3466	3493	3763	3778	0	0	0	27	297	312
520	Rural Jackson Co	221	16	16	274	0	0	0	0	-205	-205	53	0	0	0
521	Rural Jackson Co	110	6	6	136	0	0	0	0	-104	-104	26	0	0	0
522	Rural Jackson Co	134	3	3	169	0	0	0	0	-131	-131	35	0	0	0
525	Medford	119	119	119	119	421	0	0	887	0	0	0	-421	-421	466
527	Rural Jackson Co	137	7	7	169	191	0	0	400	-130	-130	32	-191	-191	209
545	Medford	446	264	264	492	165	165	165	165	-182	-182	46	0	0	0
546	Rural Jackson Co	145	17	17	178	0	0	0	0	-128	-128	33	0	0	0
654	Rural Jackson Co	6	6	6	6	3235	1050	5217	5645	0	0	0	-2185	1982	2410
841	Medford	1439	829	1591	1454	1	1	1	1	-610	152	15	0	0	0
Total		11335	11333	11331	11335	22604	22603	22594	22602	-2	-4	0	-1	-10	-2

Source: ESA\_2034\_TAZ\_worksheet\_Final.xlsx. (Kittleston & Associates)

<sup>2</sup> 2028 Network; RVMPOv v2.2

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<sup>3</sup> 2034 Land Use: Non-Medford 2034 (RVMPOv2.17\_2034) + Medford TSP 2028 (RVMPOv3.3\_2028\_20120828) + Medford 2028-2034 LU scenarios per provided changes (ESA\_2034\_TAZ worksheet\_Final.xlsx). (All calculated in TAZv2\_2034LUCalc\_20130315.xls)

## Modeling Issues

Due to the significant concentrations of activity in these scenarios (including over 30% share of retail employment, a heavy trip attractor in many of the high employment zones), the model struggled with convergence in both EMME assignment and travel time feedback. Convergence ensures a stable, repeatable assignment especially important when comparing scenarios. All but the 03 (9000) scenario were eventually able to converge. But capacity restrictions barred the last scenario from converging. For this 03 scenario, the following capacity changes were made, after which convergence occurred quickly and volume-to-capacity was kept below 1.3. These changes should be taken into considered when evaluating the feasibility of this 03 land use scenario (9500).

Area	Route 1	Link Nodes	Capacity Change to Scen 03
Medford	E. Vilas between Table Rock and Crater Lake Hwy	#3222 to 2474	+17% (900 to 1050 vph)
Medford	N. Phoenix between Juanipero Way and Fern Valley Road	#1681 to 5812	+30-50% (700/800 to 1050 vph)
Medford	Foothill, N of Zone 443, to Juanipero Way	#2781 to 3511	+30% (800 to 1050 vph)
Ashland	I-5 between the North and South Ashland interchanges	#1086 to 1883	+17% (775 to 900 vph)

Additionally, oscillations were observed of roughly 1000-2000 daily VMT in the following locations between iterations of the travel time feedback loop. Traffic was shifting between alternate routes, despite eventually converging. As a result, volumes on these roads may need to be post-processed:

Area	Route 1	Route 2	01 (7000)	02 (8000)	03 (9500)
Medford	E. Vilas, Hamrick, Hwy 62	Table Rock Road, Gregory Road	x	x	x
Medford	E. Vilas, Hamrick, Hwy 62, Bullock, I5	Table Rock Road, Gregory Road	x		
Medford	N. Phoenix/Foothill, McAndrews	I5, Barnett, Main/Hillcrest		x	x
Ashland	I-5 between the North and South Ashland interchanges	OR99 between the North and South Ashland interchanges	x	x	x

It should be noted that some of these areas are already congested in the requested base scenario (6000). Additionally, isolated zone loading issues leading to over capacity links, were also observed (#413 on Hillcrest Rd; #443 on N. Phoenix).

## Requested output

The results of the base and 3 alternative scenarios, all but Scenario 04 using a common network, were provided in GIS files of volumes and volume-to-capacity ratios.

It is understood that this will provide sufficient information for a screening analysis and any future analysis of one or more of the chosen scenarios will make use of the new RVMPOv3.1PROD model version for year 2038, including updated networks and RTP approved land use assumptions.

*For questions or comments, contact Tara Weidner at 503-986-4226.*