

Thursday, September 25, 2008

To: UGB Workgroup
From: Becky Steckler, AICP
RE: Land Needs Analysis Research for the UGB Workgroup

Introduction

Background

In 2004, the Land Conservation and Development Commission (LCDC) directed the Department of Land Conservation and Development (DLCD) to initiate an administrative rulemaking project to clarify and streamline the urban growth boundary (UGB) amendment process. DLCD initiated the first phase of this project and appointed a work group, which resulted in LCDC adopting amendments to Goal 14: Urbanization (2005) and a new set of administrative rules, OAR 660, Division 24 (2006).

When it adopted the new rules, LCDC directed the department to continue its work during the 2007-09 biennium (Phase 2). The Department set up a work group to meet between July and October 2008. The Commission's direction for Phase 2 includes evaluating UGB process issues and completing work on potential safe harbors identified in Phase 1. The workgroup is charged with making recommendations regarding UGB process amendments for LCDC consideration and possible adoption later in 2008.

Purpose of this study

The purpose of this study is to collect key data (such as housing mix, densities, percentage of land used for streets and other infrastructure, etc.) used by cities to inventory buildable land and analyze land need for the purpose of evaluating and, if necessary, expanding an urban growth boundary. This information is intended to inform the UGB workgroup about key data used by cities, in order to help the work group in formulating additional UGB "safe harbors" to streamline future UGB analyses.

Study Design

This section provides more detail about the study period, identification of documents to review, and methods for sources of documents.

- **Study period.** I worked with DLCD staff to determine the appropriate study period for this study. We initially discussed looking back five to seven years, but determined this would not provide enough acknowledged UGB documents. In order to get a larger number of studies, we decided to review UGB documents completed and approved between 1995 and 2008.

- **Identifying documents to review.** Given the types of information that the workgroup was interested in, we determined that most of the data would be found in land need assessment documents. In other words, any acknowledged documents that include a *supply* analysis (an analysis of buildable or redevelopable land within UGBs) and a *demand* analysis (population and employment growth, which drive the need for buildable space for housing and employment). These studies are generally referred to as buildable land inventories (or “BLI”, an inventory of all types of buildable land - residential, commercial, industrial, public, etc. - within a city); housing needs analysis (a study of needed housing in a city for a 20-year period); and economic opportunity analysis (a study of the need for employment land - commercial, office, industrial, and public)¹. These types of studies are either done as part of periodic review or as a “post acknowledgment plan amendment” (PAPA).

It was difficult to identify these documents from DLCDC records. The DLCDC electronic PAPA database has thousands of records that are not easy to search. By reviewing searches of the DLCDC database, I identified approximately 270 UGB amendments. Of the approximately 270 UGB amendments identified, 125 were completed between 1995 and July 2007. Of those, 49 involved amendments of more than 25 acres and of those records only 17 were expansions that included residential land. I reviewed most of these 17 records and eliminated all but about five because: (1) important records were unavailable from the city or DLCDC, or (2) the documents were available, but did not include the information requested by the UGB workgroup. However, several of the PAPA UGB expansion documents referred to BLI and land need analysis documents that are relevant to this study and I tracked those documents down and included them, if appropriate.

Most of the documents reviewed for this study were completed under periodic review. From a DLCDC spreadsheet of periodic review work tasks, I attempted to review all documents related to buildable lands inventories, housing needs analysis, and economic opportunities analysis. To be counted, a study or amendment must have been “acknowledged” and not be under appeal².

I attempted to retrieve documents from all of the cities (approximately 35) that, according to DLCDC records, completed at least a residential analysis through periodic review between 1995 and 2008. Several periodic review cases were rejected because they did not include a residential land needs analysis. Two (Brookings and Astoria) were rejected based on conversations with City staff that indicated that the information I was looking for was spread among many different documents that would be difficult to compile in the study time frame, and because city staff didn’t believe the available data was sufficient for the study.

Table 1 shows the UGB analysis, by city, included in this study. Documentation from 29 cases (either post acknowledgement plan amendments or periodic review work tasks) was included in this study.

¹ These titles are the most commonly used for this type of analysis. Some cities combine this analysis and refer to the research as an urbanization report. I use these three titles to generically refer to all reports (no matter the title) that contain similar information.

² I made one exception for the City of Rockaway Beach. Its urbanization report was adopted over a year ago with no appeal. City and DLCDC staff indicate that it should be adopted by the County and acknowledged soon.

Table 1. Documents reviewed, by city, 1995-2008

No.	Jurisdiction	Title of Document(s)	Document date	Primary researcher (City or consultant)	Source of document
1	Albany	Albany Housing Needs Analysis, 2005-2025 (2006); Update of Economic Opportunities Analysis for the City of Albany (Sept. 16, 2007)	Housing: Adopted April 25, 2007 EOA: September 16, 2007	Albany Community Development Department (Housing); ECONorthwest (EOA)	From Don Donovan, City of Albany (link to Albany website for both documents);
2	Aumsville	Ordinance No. 436: An Ordinance Amending Ordinance #324, The Aumsville Comprehensive Plan	Dec-96	City of Aumsville	DLCD Acknowledgement Room
3	Burns/Hines UGB Analysis	City of Hines/Harney County Urban Growth Boundary Analysis	May-99	Tenneson Engineering	Emailed from Tenneson Engineering
4	Coburg	Coburg Urbanization Study	Apr-04	ECONorthwest	City of Coburg website
5	Columbia City	City of Columbia City Buildable Lands Inventory & Needs Analysis	May-01	Cogan Owens Cogan	Emailed from Cogan Owens Cogan
6	Corvallis	Corvallis Land Needs Analysis	Jun-98	ECONorthwest	City of Corvallis website
7	Cottage Grove	2005 Cottage Grove Buildable Lands Analysis Update	Jun-05	Satre Associates	Michael Howard emailed me from Satre Associates
8	Gervais	Ordinance No. 33-2005	Jul-06	Mid-Willamette Valley Council of Governments	DLCD Acknowledgement Room
9	Harrisburg	City of Harrisburg Buildable Land and Land Need Analysis (1998)	Jun-05	City of Harrisburg	Sent by email from Michele Eldridge, City of Harrisburg
10	Hermiston	City of Hermiston Residential Buildable Land Inventory Hermiston Revised Exhibits	Feb-04	Hobson Ferrarini Associates	City (emailed by Clint Spencer, City Planner, 8/29/08)
11	Independence	City of Independence Buildable Lands and Land Needs Report	Oct-00	Mid-Willamette Valley Council of Governments	DLCD Acknowledgement Room
12	La Grande	Urban Area Land Use Study	Jul-01	The Benkendorf Associates Corp Johnson Gardner	From Al Berkendorff (emailed), Berkendorff and Associates
13	Lakeview	Town of Lakeview Periodic Review: Buildable Lands Inventory and Needs Analysis	Jun-99	W&H Pacific	DLCD Acknowledgement Room
14	Lebanon	Lebanon Urbanization Study	Jun-04	ECONorthwest	Bob Parker, ECONorthwest
15	Madras	Madras Urbanization Report	Nov-07	ECONorthwest	Emailed from City (Tammy McHaney)
16	Monmouth	Monmouth Comprehensive Plan Housing Element; Monmouth Comprehensive Plan Land Use Element; Monmouth Comprehensive Plan Economic Element	No date provided	Mid-Willamette Valley Council of Governments	Mark Fancey (by email)
17	Mt. Angel	City of Mt. Angel Comprehensive Plan, Urbanization Section of the Land Use Element	May-97	City of Mt. Angel	DLCD Acknowledgement Room
18	Newberg UGB Amendment, 2001	Ordinance No. 2001-2556	Nov-01	City of Newberg	Barton Brierly (link to ordinance online)
19	Newberg UGB Amendment, 2006	Ordinance No. 2006-2661, Exhibit "C" Northwest Newberg 2006 UGB Expansion, Justification & Findings Report, City of Newberg, OR, August 3, 2006	Nov-06	Winterbrook Planning	Barton Brierly (link to ordinance online)
20	Newberg	Newberg Housing and Residential Land Needs Report (2004); Economic Opportunity Analysis (2006)	2004 (Housing and Population); 2006 (Economy)	Johnson Gardner, The Benkendorf Associates Corporation (Housing); City of Newberg (Economy)	Barton Brierly (link to reports online)
21	Ontario	Ontario Urbanization Report	May-07	ECONorthwest	Evan MacKenzie (emailed)
22	Pendleton	Pendleton Urban Fringe Land Use Study, Phase II	Jul-99	The Benkendorf Associates Corporation The Bookin Group	DLCD Acknowledgement Room
23	Philomath	City of Philomath Housing Plan, Economic Plan	Aug-03	City of Philomath	DLCD Acknowledgement Room
24	Prineville	Prineville Urban Growth Boundary Expansion Evaluation Report	Apr-04	Deborah McMahon	Josh Smith, City of Prineville emailed report
25	Redmond	Redmond Urbanization Study	Jun-05	ECONorthwest Angelo Eaton & Associates	http://www.ci.redmond.or.us/internet/index.php?option=com_content&task=view&id=198&Itemid=255
26	Richland	Richland City Council - LCDC Adendments Adoption	no date provided	City of Richland	DLCD Acknowledgement Room
27	Rockaway Beach			ECONorthwest Winterbrook Planning	
28	Spray	City of Spray, 2001 Comprehensive Plan Update	Jun-01	Tenneson Engineering	DLCD Acknowledgement Room
29	Warrenton	Buildable Lands Inventory, Housing and Economic Analysis	Oct-07	Cogan Owens Cogan	City of Warrenton sent a CD in the mail.

Source: Department of Land Conservation and Development, 2008

ECONorthwest and cities tied, with seven cases each, as authoring the most case documents, as shown in Table 2.

Table 2. Primary researcher and number of cases reviewed in UGB Analysis Study

Primary Researcher	Number of cases
ECONorthwest	7
City	7
Mid-Willamette Valley Council of Governments	3
Benkendorf Associates	3
Tenneson Engineering	2
Cogan Owens Cogan	2
Winterbrook Planning	1
Hobson Ferranrini Assc.	1
Debra Mmahon	1
W&H Pacific	1
Satre and Associates	1
Total	29

Source: Department of Land Conservation and Development, 2008

Note: Documentation was assumed to be authored by the city if there was no other author information available. Note: The primary researcher is the author of the housing documents reviewed, or the lead consultant as indicated in document.

- **Sources of documents.** Given the short time frame (five weeks to create a methodology, obtain documents, and compile the information), the most efficient method of compiling the data was to obtain electronic files of documents (if available) and enter the applicable data into a database (Excel spreadsheet). I first requested these files from the cities. In a majority of the cases, I received the study from the city. If it was not available from the city (the older the files, the less likely the city had an electronic copy), I either: (1) looked for the documents in DLCD records, or (2) contacted the consulting firm that completed the work and requested the documents.

Assumptions and limitations

- **DLCD databases do not record every study and report.** I tried to identify and obtain a copy of every document that might include the information requested by the workgroup. When DLCD staff, cities that I contacted, or others involved in the research suggested an additional study I should review, I attempted to locate the study to determine if it should be included in this research. While I had only approximately five weeks to complete this research, I identified as many relevant documents as I could, and included all in this study.
- **Wide variability in the level of analysis and detail in the studies.** While DLCD has published handbooks and provided guidance to cities on conducting a housing needs analysis (*Planning for Residential Growth: A Workbook for Oregon's Urban Areas*, June 1997) and economic opportunities analysis (*Goal 9 Guidebook*, October

2005), not all cities follow these methods³. Thus, there were significant differences in the level of analysis conducted in many of the documents reviewed. To that point, not all data points I was seeking were in all of the documents I reviewed.

- **Data in the reports is assumed to be correct.** I did not double check formulas used by the cities and I assumed that GIS mapping was computed correctly. I reported the numbers that were in the reports.
- **Reported need for land in UGB, not URA.** Most reports estimated land need for 20 years for the UGB, but some estimated 50 years of land to include in an urban reserve area (URA). To be consistent, I only included land need for UGB expansion.

Summary of data

This section presents the finds for the following types of data:

- Population
- Housing mix
- Density
- Infill and redevelopment assumptions
- Gross to net acreage assumptions
- Total needed land to population change ratio

Population

Table 3 shows the cases reviewed (by city), and each city's 2007 population, study dates, study date population change, and average annual growth rates (for both the study period and 1970 to 2000).

³ While many Oregon cities are not required to comply with the requirements of ORS 197.296 (only those over 25,000), the housing needs analysis of almost all cases generally follow the steps described in the *Planning for Residential Growth – A Workbook for Oregon's Urban Areas (1997)*.

Table 3. 2007 Case study population, study period and population, and growth rates

Jurisdiction	2007 population	Beginning study date	Ending study date	Study period (years)	Beginning population	End population	Population Change	AAGR (study period)	AAGR (1970-2000)	Notes
Albany	47,470	2005	2025	20	43,400	57,030	13,630	1.40%	2.70%	This population and study date is for the housing portion only. The employment study period is 2007-2027
Aumsville	3,300	1995	2015	20	2,285	4,127	1,842	3.00%	5.42%	
Burns/Hines UGB Analysis	3020/1825	2000	2020	20	3088/1506	3484/1548	396/42		-0.24%	1970-2000 AAGR is for Burns only
Hines									0.48%	1970-2000 AAGR is for Hines only
Coburg	1,070	2000	2025	25	969	3,327	2,358	5.40%	1.02%	
Columbia City	1,955	2000	2020	20	1,735	3,100	1,365		3.58%	
Corvallis	54,890	1996	2020	24	49,275	61,029	11,754		1.14%	
Cottage Grove	9,345	2000	2025	25	8,890	12,500	3,610	1.37%	1.14%	
Gervais	2,250	2000	2025	25	2,009	3,725	1,716	2.50%	3.30%	
Harrisburg	3,400	1998	2017	19	2,535	3,640	1,105		2.52%	
Hermiston	15,780	2003	2023	20	13,819	19,656	5,837	1.80%	3.30%	While the title of the table indicates the study dates are 2003-2023, the column titles indicate the beginning population is the 2004 est., to 2024
Independence	7,905	1999	2020	21	6,195	9,559	3,364		2.81%	
La Grande	12,850	2000	2020	20	14,015	15,144	1,129		0.82%	
Lakeview	2,730	1998	2020	22	7,400	8,615	1,215		-0.30%	
Lebanon	14,705	2003	2025	22	13,140	19,597	6,457	1.80%	2.23%	
Madras	6,585	2007	2027	20	6,013	13,451	7,438	4.10%	3.67%	pi, Table 4-4, p4-8 has start pop at 6,107
Monmouth	9,335	1999			8,310	15,117	6,807	3.03%	1.30%	
Mt. Angel	3,755	1995	2016	20	3,010	4,127	1,117	1.59%	1.53%	
Newberg Amend 1, 2001	21,675	2000	2020	20	18,220	38,312	20,092	3.60%	3.40%	
Newberg Amend 2, 2006	21,675	2005	2025	20	21,152	38,352	17,200	3.03%	3.40%	
Newberg	21,675	2000	2040	40	18,064	53,000	34,936	2.73%	3.40%	Population forecasts are for 2000-2040, but the study looks at needs from 2005 to 2040
Ontario	11,325	2006	2026	20	11,425	15,692	4,267	1.50%	1.74%	
Pendleton	17,260	1998	2020	22	16,970	24,026	7,056	1.59%	0.71%	
Philomath	4,530	1997	2020	23	3,380	4,844	1,464		2.74%	
Prineville	10,190	2003	2023	20	11,600	21,778	10,178		1.95%	
Redmond	24,805	2003	2025	22	17,645	45,724	28,079	4.42%	4.29%	
Richland	150	1995	2020	25	180	300	120		0.33%	
Rockaway Beach	1,360	2007	2027	20	1,394	1,709	315	1.02%	2.15%	
Spray	160	2000	2020	20	188	248	60		-0.47%	
Warrenton	4,645	2006	2027	21	4,503	6,481	1,978	1.80%	2.69%	

Source: 2007 population from PSU Population Research Center, March 2008 estimates; 1970-2000 AAGR calculated by DLCD from data provided by PSU Population Research Center. All other data is compiled by DLCD from documents listed in Table 1.

Housing mix

Table 4 shows the housing mix proposed for each case (if it was provided).

Table 4. Housing mix of case studies

Jurisdiction	Beginning population	Proposed SF	Proposed MF	Proposed Manufactured/mobile home park	Notes
Cities between 10,000-50,000: Range		47%-80%	20%-50%	4%-23%	
Corvallis	49,275	50%	50%		
Albany	43,400	47%	48%	4%	
					Proposed housing mix: LDR: 47% MDR: 27% HDR: 25%
Newberg Amend 2, 2006	21,152				
Newberg Amend 1, 2001	18,220				Med den: 32%;
Newberg, Other	18,064	57%	38%	4%	
Redmond	17,645	75%	25%		
Pendleton	16,970	60%	30%	10%	
La Grande	14,015	54%	23%	23%	
Hermiston	13,819				
Lebanon	13,140	BL: 80%, A: 70%	BL: 20%, A: 30%		BL: Baseline, A: Alternative
Prineville	11,600				
Ontario	11,425	76%	24%		
Cities between 2,500-9,999: Range		46%-75%	10%-37%	5%-18%	
Cottage Grove	8,890	70%	25%	5%	
Monmouth	8,310	57%	37%	6%	
Lakeview	7,400	75%	10%	15%	
Independence	6,195	46%	37%	18%	
Madras	6,013	75%	25%		
Burns/Hines UGB Analysis	3088/1506 (4594)				
Warrenton	4,503	61%	26%	14%	
Philomath	3,380				
Mt. Angel	3,010	70%	30%		
					Numbers don't equal 100% due to rounding
Harrisburg	2,535	75%	22%	4%	
Cities between 100-2,499: Range		65%-80%	13%-25%	7%-10%	
Aumsville	2,285	65%	25%	10%	
Gervais	2,009	79%	13%	8%	
Columbia City	1,735	76%	17%	7%	
Rockaway Beach	1,394	80%	20%		
Coburg	969	75%	25%		
Spray	188				
Richland	180				

Source: Department of Land Conservation and Development, 2008.

Density

Cities presented a wide range of gross or net densities, for existing land supply and for proposed land need, as shown in Table 5. Cities did not always indicate whether the acreage for this data was in gross or net (in such cases, data are shown in the gross column in Table 5, but are in gray text). Surprisingly, average net densities tended to

increase as population size got smaller. Given the very small sample of all cities, I would caution readers from drawing definitive conclusions from this finding.

Table 5. Density of case studies, by city and beginning population of the study period

Jurisdiction	Beginning population	Existing GROSS res. density (du/ac)	Existing NET res. density (du/ac)	Proposed GROSS res. density (du/ac)	Proposed NET res. density (du/ac)
Cities between 10,000-50,000: Average net density					5.94
Corvallis	49,275			5.40	7.00
Albany	43,400	3.97			4.68
Newberg Amend 2, 2006	21,152	4.40 LDR: SF Detached 9.00 MDR: Duplexes 16.50 HDR: 2-story aparts.			
Newberg Amend 1, 2001	18,220			LDR: 4.00 MDR: 6.00 MDR/MH: 7.00 HDR: 15.00	
Newberg, Other	18,064	5.21		6.27	
Redmond	17,645		5.10	5.90	7.50
Pendleton	16,970				6.18
La Grande	14,015	6.00 (median, not average)			5.08
Hermiston	13,819	SF Detached: 4.2 SF Attached: 7.2 Manufactured: 7.3 MF: 15.3		SF Detached: 4.2 SF Attached: 7.2 Manufactured: 7.3 MF: 15.3	
Lebanon	13,140		5.92 du/ac for low density residential zone and 7.27 du/ac for mixed density residential zone	5.50	7.10
Prineville	11,600				5.00
Ontario	11,425		4.30	3.90	5.00
Cities between 2,500-9,999: Average net density					6.86
Cottage Grove	8,890	6.40		Gen. Res.: 4.7 MD Res.:10.4 HD Res.12.7	
Monmouth	8,310				7.70
Lakeview	7,400				
Independence	6,195				6.97
Madras	6,013		3.00	4.50	5.90
Burns/Hines UGB Analysis	3088/1506 (4594)				
Warrenton	4,503				
Philomath	3,380				
Mt. Angel	3,010			SF: 4.64 du/ac MF: 9.00 du/ac	
Harrisburg	2,535	SF: 2.27 MF: 16.02			SF = 6.00 du/net acre MF =17.00 du/net acre
Cities between 100-2,499: Average net density					7.07
Aumsville	2,285	SF: 4.44 units/acre MF: 7.96 units/acre Mobile Homes: 6/04 units/acre		5.15	
Gervais	2,009			7.37	
Columbia City	1,735			4.50	5.40
Rockaway Beach	1,394		7.60	6.80	8.80
Coburg	969		3.9		7.00
Spray	188				
Richland	180			3.00	

Source: Department of Land Conservation and Development, 2008.

Note: Documentation that did not indicate if acres were gross or net are shown in gray. They are not included in average net density calculations.

Infill and redevelopment assumptions

Table 6 shows residential and employment infill and redevelopment assumptions for each case (those with no data are shown, but the last two columns are blank). Most of the documents that defined “redevelopable land” correlated it to an improvement-to-land-ratio of less than 1:1. Two cases stated that the improvement value must be approximately one-third of the land value (Cottage Grove and Hermiston) to be considered redevelopable. Three other cases (Gervais, Independence, and Monmouth) indicated that there must be a minimum improvement value (\$5000) to be considered redevelopable. Only three cases (Madras, Redmond, and Monmouth) indicated that zoning should be changed to allow for higher densities before land could be considered redevelopable (i.e., maintaining the current zoning would result in the replacement of dwellings but would not provide an increased supply). Only Mt. Angel, a relatively small city, evaluated redevelopment potential on a site-by-site basis.

Table 6. Case study residential infill and redevelopment assumptions

Jurisdiction	Beginning population	Residential infill and redevelopment assumptions	Employment infill and redevelopment assumptions
			<ul style="list-style-type: none"> • Typical refill (infill and redevelopment) deductions range from 10% in small cities to 30% or more for larger areas. For example, Portland Metro estimated refill at around 40% for 1996 and 1997 in a small empirical study they conducted. The 2000 Economic Opportunities analysis assumed a refill rate of about 10%. However, because the current Buildable Lands Inventory already accounted for infill and redevelopment, we assumed 0%. • Redevelopable (developed, but likely to be redeveloped in the next 20 years). Land with an improvement value of less than \$100,000 and a size of at least 0.5 acres was considered redevelopable.
Albany	43,400		
Aumsville	2,285		
Burns/Hines UGB Analysis	3088/1506 (4594)		

Jurisdiction	Beginning population	Residential infill and redevelopment assumptions	Employment infill and redevelopment assumptions
Coburg	969	<p>A ratio of less than 1:1 is a typical, but arbitrary, standard for identifying lands with redevelopment potential. Lots 14,000 square feet or larger were assumed to have infill potential. The data in (Table 3-6) only address infill through the partitioning of lots. Not all of these lots will be partitionable lots, however. The building footprint will preclude portioning of many of the lots. Moreover, landowner willingness will be a factor. Note: The City could choose to adopt other policies, such as accessory dwelling units, that would increase the density and number of dwelling units in developed residential areas of Coburg.</p>	
Columbia City	1,735		
Corvallis	49,275	<p>Redevelopment Potential means all commercial multi-family residential District Designation RS 12 or RS 20 or industrial parcels any of which is greater than 0.1 acres and have land values greater than improvement values and are not already classified as vacant or partially vacant. Not all or even a majority of parcels that meet these criteria for redevelopment potential will be assumed to redevelop during the planning period. We assumed that 25% of land with improvement to land value ratios of less than 1:1 would redevelop during the 20-year planning period.</p>	

Jurisdiction	Beginning population	Residential infill and redevelopment assumptions	Employment infill and redevelopment assumptions
Cottage Grove	8,890	<p>City staff inventoried potential infill development properties by searching the Lane County Regional Land Information Database (RLID) for properties that had enough acreage to allow additional development on the property. They were checked against 1997 aerial photos to determine if the location of existing buildings on the property would allow for additional development.</p> <p>Properties inventoried for redevelopment potential was determined by the value of the existing structure being less than 1/3 of the total property value. City staff used RLID to determine redevelopment potential for property in Cottage Grove's UGB. The 1/3 ratio is suggested by the Planning for Residential Growth, A Workbook for Oregon's Urban Areas handbook, a publication by the Oregon Department of Land Conservation and Development.</p>	
Gervais	2,009	<p>Redevelopable land includes parcels in all zones where some limited improvements have been made, but where potential for redevelopment for more intense uses is high. For the purpose of this analysis, redevelopable land is defined as parcels in all zones with improvement values of less than \$5,000 where the ratio of land value to improvement value is 1:1 or greater. For larger residential parcels, this land may instead be classified as partially vacant. The area of redevelopable parcels is added to the amount of gross buildable land.</p>	<p>Redevelopable (employment) land is defined as parcels with improvement values of at least \$5,000 (based on Marion County Assessor records), where the ratio of land value to improvement value is 1:1 or greater. This analysis does not distinguish between vacant or redevelopable land in determining where new employment will occur. The analysis assumes that 85 percent of employment growth occurs on land that is either vacant or redevelopable. (The remaining 15 percent consists of employees working at home or new employment on existing developed land.)</p>

Jurisdiction	Beginning population	Residential infill and redevelopment assumptions	Employment infill and redevelopment assumptions
Harrisburg	2,535	Redevelopable Land: parcels not classified as partially vacant and with land values greater than the improvement values are more likely to be redeveloped provided the parcels are located in areas where redevelopment is likely to occur, and to a more intensive use. For example, an older single-family residence valued less than the land it was situated on and located in an area zoned for more intensive use has the potential for redevelopment. We identified redevelopable parcels using a combination of the above criteria, site visits, and a review of development patterns over the last five years.	
Hermiston	13,819	Parcels with an improvement to value ratio of less than 0.30, less land owned by government, churches and other constraints.	No description of a different methodology for Employment
Independence	6,195	Redevelopable land is defined as parcels in all zones with improvement values of at least \$5000 where the ratio of land value to improvement value is 1:1 or greater.	
La Grande	14,015		
Lakeview	7,400		
Lebanon	13,140		Redevelopable land. Land on which development has already occurred but on which, due to present or expected market forces, there exists the potential that existing development will be converted to more intensive uses during the planning period. Redevelopable land includes lands designated for commercial and industrial uses with improvement to land value ratios of less than 1:1. Redevelopable land is a subset of developed land.

Jurisdiction	Beginning population	Residential infill and redevelopment assumptions	Employment infill and redevelopment assumptions
Madras	6,013	(A) low improvement to land value ratio does not necessarily suggest redevelopment. In the context of a buildable lands inventory, the City is only interested in redevelopment that results in higher densities. For example, 111 of the 244 acres with improvement to land value ratios less than 1:1 are in the R-1 zone. While it is likely that some, perhaps many, of these low improvement value lots will redevelop, zoning will preclude development at higher densities. In short, what the City should expect on these parcels is replacement of substandard dwelling units, not increased densities.	
Monmouth	8,310	<ul style="list-style-type: none"> • Redevelopable land includes parcels in all zones where some limited improvements have been made, but where potential for redevelopment for more intense uses is high. For the purpose of this analysis, redevelopable land is defined as parcels in all zones with improvement values of at least \$5,000, where the ratio of land value to improvement value is 1:1 or greater. For residential parcels, this land may instead be classified as partially vacant. The area of redevelopable parcels is added to the amount of gross buildable land. 	Redevelopable land is defined as parcels with improvement values of at least \$5,000 (based on Polk County Assessor records), where the ratio of land value to improvement value is 1:1 or greater.
Mt. Angel	3,010	Determined redevelopable acres on a site-by-site basis. On site on an 18-acre site that current is a nursery. It has a low-density residential designation and could be redeveloped as SF. Possibility of redeveloping some SF housing that is on MF designated land to MF.	
Newberg Amend 1, 2001	18,220		
Newberg Amend 2, 2006	21,152		
Newberg, Other	18,064		
Ontario	11,425	Land on which development has already occurred but on which, due to present or expected market forces, there exists the potential that existing development will be converted to more intensive uses during the planning period. Redevelopable land is a subset of developed land and was identified using improvement to land value ratios and City input.	

Jurisdiction	Beginning population	Residential infill and redevelopment assumptions	Employment infill and redevelopment assumptions
Pendleton	16,970	All developed lots between .5 and 1 acre in size with a total value of less than \$50,000 have a redevelopment potential. 50% of all lots with redevelopment potential are assumed to redevelop in the next 20 years. Note: land to improvement value ratios were not available	
Philomath	3,380		
Prineville	11,600		
Redmond	17,645	For residential lands, this study is interested only in those tax lots that would redevelop to higher densities. For example, a lot that is zoned high-density residential with a single-family dwelling may have redevelopment potential. ECO used improvement/land value ratios of less than 1:1 combined with zoning that would enable redevelopment to determine residential redevelopment potential.	For non-residential land, ECO used a demand side approach to assess redevelopment on commercial and industrial lands (e.g., we allocated a percentage of employment to commercial and industrial lands).
Richland	180		
Rockaway Beach	1,394		
Spray	188		
Warrenton	4,503	Redevelopable land includes developed land that may or may not contain a low value of improvements relative to the value of the land and may be economical to develop for more intensive or different uses.	

Source: Department of Land Conservation and Development, 2008.

Gross to net acreage assumptions

Table 7 lists the gross-to-net (or net-to-gross) acreage assumptions⁴ for each case. Six of the cases forecast different net-to-gross assumptions based on the type of dwelling unit (single-family, manufactured, condo/townhomes, or multi-family). The most common assumptions were:

⁴ Analysts generally calculate either gross buildable acres (land that has no constraints, such as wetlands, steep slopes, etc.) or net buildable acres when conducting a land inventory or a land need. The "gross" refers to the land for development plus that which is necessary for public facilities: roads, right-of-way, and sometimes schools and parks. The "net" subtracts the estimated land needed for facilities. A gross-to-net factor is often expressed as a percentage, generally between 10% and 30%, depending on which services are included in the factor. To calculate net-to-gross buildable acres, divide the net acres by (1-net to gross factor). To calculate the gross-to-net buildable acres, multiply the gross acres by (1-gross to net factor). For example, 1000 net acres/(1-.25 net to gross factor)=1,333.33 gross acres. 1333.33 gross acres/(1-.25 gross-to-net factor)=1000 net acres.

- Single-family detached: 25%
- Manufactured: 20%
- Condo/townhome: 15%
- Multi-family: 10%

ECONorthwest used the above assumptions (or slightly modified assumptions) in six of the seven reports it authored. Of the remaining reports that provided the gross-to-net acreage assumptions, four were descriptive and didn't provide the percent added. Of those, two did not account for additional acreage needed for future roads (the City of Newberg, Amend 2, except for the Dundee-Newberg Bypass, and the City of Hermiston). Six additional cases added 25% to 28% for public uses. These reports did not indicate if the gross-to-net additions were applied only to residential land, or residential and employment lands. The gross-to-net assumptions for employment uses, when included, were generally smaller than residential uses. The City of Independence used a 0% gross-to-net assumption and the City of Albany used a 10% assumption.

Table 7. Case study gross-to-net acreage assumptions

Jurisdiction	Beginning population	Gross-to-net assumptions
Corvallis	49,275	30% for SF 25% for MF
Albany	43,400	Housing: Net Density = Total # of Units/Net Project Area, which excludes land dedicated to streets, parks, open space or similar public use (often equivalent to the total area in residential lots) Employment: The final assumption is a net to gross factor. The EPA assumptions are employees per net acre (e.g., acres that are in tax lots). As land gets divided and developed, some of the land goes for right-of-way and other public uses. The net to gross factor varies by land use, but 10% is a reasonable assumption for employment lands based on existing development patterns in the Buildable Lands Inventory.
Newberg Amend 2, 2006	21,152	Physical constraints such as steep slopes (greater than 25%) and stream setbacks (25 feet on either side of a stream corridor) have been deducted from the parcel size. Thus, the buildable land inventory is based on buildable acres, not gross acres. This inventory also omits land located within the future right-of-way of the proposed Newberg-Dundee Bypass but not land for future local street rights-of-way.
Newberg Amend 1, 2001	18,220	
Newberg, Other	18,064	Net buildable vacant acres are calculated by subtracting land needed for future public facilities from the gross buildable acreage. For the purpose of this analysis, land needed for future facilities is defined as 25% of all non-public vacant land.
Redmond	17,645	SF Detached=25% Manufactured=20% Condo/Townhomes=15% Multi-family=10%
Pendleton	16,970	
La Grande	14,015	For the purpose of this analysis, land needed for future facilities is defined as 25% of all non-public vacant land.

Jurisdiction	Beginning population	Gross-to-net assumptions
Hermiston	13,819	To convert gross acres to net buildable acres, constrained land which is not likely to be available for residential development was removed from the inventory, including: 1. Environmentally constrained land: Wetlands, Steep slopes, Riparian areas, and Flood plains. 2. Land constrained by easements for BPA power lines and the many irrigation canals that run through the Hermiston UGB; 3. Land owned by government agencies (schools, city, and county) and churches; and 4. Expected encroachment for commercial development.
Lebanon	13,140	SF Detached=25% Manufactured=20% Condo/Townhomes=15% Multi-family=15%
Prineville	11,600	
Ontario	11,425	SF Detached=25% Manufactured=20% Condo/Townhomes=15% Multi-family=15%
Cottage Grove	8,890	Land must be set aside for public facilities, such as roads, schools, churches, and parks. In residential districts, a factor of 25% will be used to calculate the NET-NET buildable lands. In commercial and industrial lands, a factor of 20% will be used to calculate NET-NET buildable lands. <i>Note: One NET is taking out the constraints (wetlands, steep slopes, elevation, etc.)</i>
Monmouth	8,310	The analysis also includes an assessment of land that is not buildable due to physical constraints such as steep slopes, riparian buffers, floodways, and wetlands. These areas have been subtracted from the amount of gross acreage that is considered buildable. This analysis also assumes that 28% of the gross buildable land will be dedicated for use as public facilities (rights-of-way, parks, etc). This percentage has been subtracted from the gross amount of buildable land.
Lakeview	7,400	The BLI is a database that starts with gross vacant lands and subtracts land that is environmentally constrained, lots that are considered too small for development, and land needed for future public facilities, such as road right-of-way.
Independence	6,195	A review of the six subdivisions platted in Independence since the city's last periodic review of the comp Plan in 1987 shows that, on average, 27% of gross land area has been dedicated for public facilities. This analysis assumes that 27% of the gross buildable residential land will be dedicated for use as public facilities. Commercial and industrial lands are typically developed along existing transportation facilities and do not require subdivision. Consequently, the dedication of public rights-of-way for streets or other public utilities is not often associated with commercial and industrial development. For this reason, we do not subtract any area for dedication of future public facilities from the amount of gross buildable commercial or industrial land. <i>Note: Includes parks</i>
Madras	6,013	SF Detached=25% Manufactured=25% Condo/Townhomes=15% Multi-family=15%

Jurisdiction	Beginning population	Gross-to-net assumptions
Burns/Hines UGB Analysis	3088/1506 (4594)	It should be noted, the Buildable Lands Inventory acreages prepared by the County differ by a factor of approximately 15 percent less than the acreages presented in this report, due primarily to differing methodologies of determining the total acreages. The information presented in this report is calculated from a computer base map and includes roads, streets and other public rights-of-way factors. The Buildable Lands Inventory conducted by Harney County is a tabulation of the Assessor lot size determinations, which are generally net acres.
Warrenton	4,503	Deducted 25% of buildable acreage for lots one acre or greater to account for infrastructure.
Philomath	3,380	
Mt. Angel	3,010	One reference to a 25% net to gross assumption
Harrisburg	2,535	We used the ratio of net acres to gross acres from actual subdivision construction from January of 1992 through March of 1998 to convert gross acres to net acres. On average 25% of lands in subdivisions were dedicated to roads and rights-of-way. During this time subdivision development occurred at 93.6% of maximum allowable density.
Aumsville	2,285	
Gervais	2,009	For vacant or partially vacant parcels larger than one acre, this analysis also assumes that 25% of the gross buildable residential land will be dedicated for use as public facilities (rights-of-way, parks, etc). This percentage has been subtracted from the gross amount of buildable residential land.
Columbia City	1,735	R1=20% R2=18% R3 SF=17% R3 MF=15% MHP=10%
Rockaway Beach	1,394	SF Detached=25% SF Manufactured=20% MF Condo/Town=15% MF=10%
Coburg	969	The acreages are based on the net density assumptions shown in Table 4-12 and a net-to-gross factor of 25% for single-family, 20% for condos/townhomes, 15% for manufactured, and 10% for multifamily.
Spray	188	
Richland	180	

Source: Department of Land Conservation and Development, 2008.

Total needed land to population change ratio

Table 8 shows the percent of total needed land in residential and employment uses, and the ratio between total needed land and population change. I only included total needed acreage when the documents provided acreage for residential **and** employment. Some reports (primarily the ECONorthwest reports) also reported a need for public or semi-public land. This land need is included in the total needed land in Table 8. Approximately 54% of needed land is residential, 44% is employment (the remaining 2% is needed land for other purposes, such as schools, parks, or other public services that calculated these uses separately). The total percent of land for residential uses increased, and the percent for employment decreased, as population size decreased.

Table 8. Case study percent of land needed for residential and employment uses and ratio of land need to population change

Jurisdiction	Beginning population	Total needed land (gross) res., emp. & other	Total needed land (gross) (res.)	% res. of total need	Total needed land (gross) (emp)	% emp of total need	Population change	Ratio needed land to pop. change (acre/person)
Average ratio for all cities								
Cities between 10,000-50,000: Average percent and ratio:								
Corvallis	49,275	2131.00	944.00	54%	1187.00	44%	11,754	0.22
Albany	43,400			44%	720.00	56%	13,630	0.19
Newberg Amend 2, 2006	21,152		874.00				17,200	
Newberg Amend 1, 2001	18,220		1636.00				20,092	
Newberg, Other	18,064						34,936	
Redmond	17,645	3803.00	2354.30	62%	1448.70	38%	28,079	0.14
Pendleton	16,970	1016.40	689.60	68%	326.80	32%	7,056	0.14
La Grande	14,015	195.88	131.88	67%	64.00	33%	1,129	0.17
Hermiston	13,819						5,837	
Lebanon	13,140	1121.20	468.50	42%	532.10	47%	6,457	0.17
Prineville	11,600	1693.37	945.60	56%	747.77	44%	10,178	0.17
Ontario	11,425	1419.00	593.40	42%	825.60	58%	4,267	0.33
Cities between 2,500 - 9,999: Average percent and ratio								
Cottage Grove	8,890	395.47	263.36	67%	132.11	27%	3,610	0.11
Monmouth	8,310				444.00	33%	6,807	
Lakeview	7,400		43.00		48.99		1,215	
Independence	6,195	312.42	203.09	65%	109.33	35%	3,364	0.09
Madras	6,013	1504.80	635.80	42%	510.70	34%	7,438	0.20
Burns/Hines UGB Analysis	3088/1506 (4594)						396/42	
Warrenton	4,503	274.10	188.30	69%	85.80	31%	1,978	0.14
Philomath	3,380	145.20	115.90	80%	29.30	20%	1,464	0.10
Mt. Angel	3,010	90.00	80.00	89%	10.00	11%	1,117	0.08
Harrisburg	2,535						1,105	
Cities between 100-2,499: Average percent and ratio								
Aumsville	2,285	414.25	128.00	70%	281.00	18%	1,842	0.42
Gervais	2,009		48.17	31%		68%	1,716	0.22
Columbia City	1,735		111.80				1,365	
Rockaway Beach	1,394	91.60	81.40	89%	8.20	9%	315	0.29
Coburg	969	327.50	167.90	51%	106.60	33%	2,358	0.14
Spray	188	49.15	34.00	69%	5.65	11%	60	0.82
Richland	180	50.38					120	0.42

Source: Department of Land Conservation and Development, 2008.

Note: The total needed land for Lebanon, Madras, and Coburg includes 120, 348.3, and 53 acres, respectively, of additional land for public services (such as parks, schools, etc.)

Note: The average ratio for cities between 100-2,499 and the average for all cities does not include Aumsville, as gross or net acreage was not identified.