

Technical Report
City of Sisters Commercial and Industrial Future Land Needs
Analysis

February 2, 2003

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Technical Overview

Task 1: Inventory the supply of buildable commercial and industrial land

Overview: Task 1 calculates how much vacant and re-developable commercial and industrial land (C, C-HC and IL designated) is inside the Sisters Urban Growth Boundary (UGB).

A Geographic Information Systems (GIS) was used to calculate the information needed in Task 1. The information used was the Deschutes County Real Estate Data Package in GIS shapefile format, as of March 1, 2002.

The methodology and assumptions used in this part of the analysis are presented below.

Step 1: Calculate the gross vacant acres by plan designation, including fully vacant and partially vacant parcels.

- All taxlots inside the City of Sisters UGB were included in the initial inventory
- The City of Sisters and Sisters UGB are identical areas
- The zoning of each parcel was determined by overlaying digital zoning maps with digital maps of taxlots
- Duplicate taxlots created by the overlay process were deleted
- Vacant/developed status was determined by analyzing the relationship between improvement values and assessment information
- Parcels with a zero improvement value, or that were assessed showing no structural improvements were assumed to be vacant
- Parcels with improvement values equal to or greater than 30% of the total value, or were assessed with a residential, commercial, or other type of structure were assumed to be developed
- Based on a year 2000 aerial photograph, areas used for building and parking were calculated for developed parcels. Since many commercial and industrial parcels are under-utilized and will likely redevelop.
- Parcels with an improvement value equal to or less than 30% of the total value were considered re-developable, and not vacant or developed
- Assumptions and classifications of the parcels were checked by the City of Sisters planner for accuracy and appropriateness

Step 2: Calculate the gross buildable vacant acres by plan designation by subtracting unbuildable acres from total vacant acres.

- Only land zoned LI, C, and C-HC became part of the inventory of industrial and commercial land, other parcels were eliminated from the inventory
- Lands owned by the City of Sisters, United States Forest Service, State of Oregon, and street rights-of-way were subtracted from the land inventory
- The size of each parcel in acres was calculated based on the GIS "AREA" field to result in gross vacant acres for each taxlot
- No other significant topographic or natural hazards (high slopes, faults, etc.) limit development in the Sisters UGB
- Lands included in the inventory are shown in *Figure 1: Industrial and Commercial Lands*.

Step 3: For lands shown in *Figure 1: Industrial and Commercial Lands*, calculate net buildable vacant acres by plan designation by subtracting land for future facilities from gross buildable vacant acres.

- For each vacant and re-developable taxlot, 25% (for future public infrastructure) of each taxlot’s area was calculated and subtracted from gross buildable acres to result in net buildable acres
- For developed taxlots, no additional area was subtracted for public infrastructure, since such infrastructure already exists
- For developed taxlots, the area used for buildings and parking was subtracted from the total area of these taxlots to estimate the remaining net Buildable acres of developed taxlots

Step 4: For lands shown in *Figure 1: Industrial and Commercial Lands*, calculate total net buildable acres by LI, C, and C-HC plan designations by adding re-developable acres, and buildable portions of developed parcels, to net buildable vacant acres.

Results: Tables 1 and 2 present the results of the analysis described in Steps 1-4.

Table 1: Commercial Land Inventory Statistics

Commercial Zones: C and C-HC	Count	Gross Buildable Acres of Parcels	Pubic Infrastructure (25%)	Net Buildable Acres
Vacant C	55	42.2	10.6	31.7
Vacant C-CH	3	7.6	2.0	5.7
Subtotal Vacant C and C-HC				37.3
Developed C	139	40.1	Existing	40.1
Developed C-CH	7	44.7	Existing	44.7
Subtotal Developed C and C-HC				84.8
Minus Developed Area ⁽¹⁾				45.0
Remaining Developable Acreage of Developed Lands				39.8
Re-developable C	30	7.7	1.9	5.8
Re-developable C-HC	3	8.2	2.1	6.1
Subtotal Re-developable C and C-HC				11.9
Total Developable C and C-CH Lands				89.0

(1) GIS analysis calculated 36 acres of built areas including buildings and parking areas. The 36 acres was increased by 25% to estimate existing built areas.

Note: Totals may not sum due to rounding.

There are 37.3 net buildable acres of vacant C and C-HC designated parcels inside the Sisters UGB. Adding 11.9 net buildable acres of re-developable and 39.8 acres of developable acreage of developed lands, a total of 89 acres of buildable C and C-HC lands are inside the Sisters UGB.

Table 2: Light Industrial Land Inventory Statistics

Industrial Zone: LI	Count	Gross Buildable Acres of Parcels	Pubic Infrastructure (25%)	Net Buildable Acres
Vacant LI	17	74.5	18.6	55.9
<i>Vacant LI</i>				55.9
<i>Minus Runway Protection Zone</i>				12.0
<i>Subtotal Vacant LI</i>				43.9
Developed LI	33	33.0	Existing	33.0
<i>Subtotal Developed LI</i>				33.0
<i>Minus Developed Area ⁽¹⁾</i>				16.0
<i>Remaining Developable Acreage of Developed Lands</i>				17.0
Re-developable LI	4	4.4	1.1	3.3
<i>Subtotal Re-developable LI</i>				3.3
Total Developable LI				64.2

(1) GIS analysis calculated 13 acres of built areas including buildings and parking areas. The 13 acres was increased by 25% to estimate existing built areas.

Note: Totals may not sum due to rounding.

There are 43.9 net buildable acres of vacant LI designated parcels inside the Sisters UGB. Adding 3.3 net buildable acres of re-developable and 17.0 acres of developable acreage of developed lands, a total of 64.2 acres of buildable light industrial (LI) lands are inside the Sisters UGB.

Task 2: Determine future commercial and industrial land needs

Overview: This task seeks to determine the amount of commercial and industrial land that will be demanded inside the Sisters UGB until year 2025. This requires using regional population and economic forecasts, local building license information, and industry sector characteristics to calculate land needs.

Employment forecasts are not prepared for individual cities in Oregon, but are completed for regions. Since specific information is lacking for Sisters, this analysis uses a combination of local data, county level data, and regional data to estimate likely employment growth. Assumptions, which are clearly stated so their appropriateness can be evaluated, are necessary for this analysis to be completed.

1.0 Local Employment Background

Table 1 shows farm and non-farm employment in Deschutes County from 1990 to 2001. It shows an increase of over 19,530 non-farm jobs in the county between 1990 and 2001. It also demonstrates relatively stable annual unemployment rates at above 6%. Employment grew by 58% over this time period and population grew by 53% percent.

Table 1: Deschutes County Employment Profile

Year	<i>Population</i>	<i>Per Capita Income</i>	<i>Annual Average Unemployment</i>	<i>Total Employment</i>	<i>Non-Farm Employment</i>
1990	79,800	\$19,191	6.4%	40,160	33,450
1995	94,100	\$21,967	6.5%	47,120	40,670
2000	116,600	\$25,680	5.3%	58,285	52,600
2001	122,050	\$26,469	6.4%	57,669	52,980

Source: Oregon Data Sheets, Deschutes County, Oregon Employment Department, 2002.

The discussion below is from the *Region 10, 2002 Regional Economic Profile*, by the Oregon Employment Department. Excerpts from this report are presented to describe the economic climate in Deschutes County.

On average, unemployment in Deschutes County was 1.2 percentage points above the statewide average during the 1990s; while, from 1995 to 2000, it averaged 1.6 percentage points higher. These consistently higher unemployment rates are mostly the result of Deschutes County's high level of population growth. Population increased by 53.9 percent from 1990 to 2000, the highest rate in the state and the fifth highest in actual terms.

Along with this accelerated increase in Deschutes County's population came an almost equal increase in its civilian labor force. From 1990 to 2000, Deschutes County's civilian labor force grew by almost 50 percent. In terms of actual numbers, Deschutes County saw its civilian labor force expand by 20,430 more labor force participants over the same period...

Though this expansion is impressive, Deschutes County was not able to match it with an equally impressive rate of job creation. Over the same period, the ranks of Deschutes County's unemployed expanded at an extraordinary rate of 45 percent, or by 1,000 more individuals.

Though Deschutes County has made impressive strides in increasing job opportunities, population growth still poses a formidable challenge to lowering its overall unemployment rate... Based on recently compiled Oregon Employment Department data, the available labor pool in Deschutes County is highly educated. Of the 13,493 individuals that comprised the Oregon Employment Department's applicant pool in Deschutes County from July 1, 2000 to June 30, 2001, 86 percent had at least a high school education or higher. Of these, 32.2 percent had some post secondary education, with 12.8 percent having attended at least three years of college or more. This high level of education among Deschutes County's growing work force combined with a regional educational system that emphasizes partnering with businesses represents a powerful marketing tool. This situation is beneficial, both in terms of the expansion of existing businesses and recruitment of potential employers that offer wages commensurate to the quality of life Deschutes County and Region 10 as a whole have to offer (page 14).

Regional Industry Employment Trends (Jefferson, Crook, and Deschutes) 1990-2000

In contrast to the early 1980s, Central Oregon experienced healthy job growth throughout most of its industry sectors in the 1990s. In all but three sectors, growth was well above 50 percent. The highest growth rate occurred in the region's construction and mining sector (94.6%). This high growth rate was the result of the region's expanding population, which led to tremendous growth in both residential and commercial construction. Only one sector experienced a decline: the lumber and wood products sector. This sector experienced a contraction of 20 percent during the 1990s as limits to logging on public lands, weak markets, and competition from other states and foreign suppliers continued to take their toll on this traditional mainstay of the region's economy. Even given its decline over the last decade, lumber and wood products employment still accounts for about 54 percent of the region's manufacturing base and eight percent of its total non-farm payroll employment (page 19).

Manufacturing Sector

During the 1990s, Central Oregon's manufacturing sector underwent significant structural change. Most significant was a decline in lumber and wood products employment and the rise of employment in other manufacturing industries. From 1990 to 2000, Central Oregon witnessed the disappearance of more than 1,200 lumber and wood products jobs. Employment in lumber and wood products in ...Deschutes counties declined by about ...32 percent... Deschutes County more than replaced job losses in lumber and wood products with employment in other manufacturing sectors for a net growth rate of nine percent (+490 jobs)... Examining detailed 1999 data, a picture emerges of a manufacturing sector that has not exchanged the dominance of the lumber and wood products industry for that of another manufacturing sector. To the contrary, job growth in other manufacturing has been spread throughout various manufacturing industries in Deschutes County. This has resulted in Deschutes County beginning the 21st century with a manufacturing base that is more diverse, vibrant, and well positioned to mitigate any negative impact from downturns in any particular sector (page 21).

Non-manufacturing Sector

Central Oregon's non-manufacturing sector experienced significant growth during the 1990s as well, following a similar trend at both the state and national levels.

With growth of 66.2 percent, or 22,250 additional jobs, non-manufacturing employment has been the principal force behind job creation in Central Oregon. Growth in non-manufacturing employment ranged from a high of 71 percent in Deschutes County to 51 and 41 percent in Crook and Jefferson counties, respectively. Three sectors (trade, services, and government) accounted for about three-fourths of non-manufacturing's growth since 1990. Trade accounted for 30 percent of the increase in the non-manufacturing sector, with the lion's share (91%) of this growth occurring in Deschutes County's retail trade sector. Based on detailed data from 1999, most of retail's growth occurred in general merchandise stores (18%), eating and drinking places (38%), and auto dealers/services (14%). The service sector accounted for one-quarter of non-manufacturing's job growth during the 1990s, with most of this growth concentrated in the business and health services industries. The combined increases in both these industries equaled over half of the total growth in services during the decade. Again, the majority of this gain occurred in Deschutes County, which accounted for 94 percent of business services growth and 93 percent of health services growth region wide. A closer look at business services reveals that almost half of the increase in this sector occurred in the help supply industry (temporary and professional employer agencies). In the health services sector, a large portion of growth was in medical doctors' offices and clinics, which accounted for 37 percent of the total increase in health services. Based on data from the 1990 and 1999 editions of this publication, government employment grew by 42 percent over the decade in Central Oregon. Most of this growth (93%) occurred in local government institutions, with the majority occurring in local educational institutions. This large increase in educational institutions is a direct consequence of the region's population growth (page 22).

Table 2 provides a more recent snapshot of employment by industry in Deschutes County. Table 2 shows that 81.3% of payroll employment in Deschutes County is in non-manufacturing, and that 18.7% of payroll employment is in manufacturing. Compared to other counties in Central Oregon, the manufacturing sector in Deschutes County is more diversified.

Table 2: November 2002 Non-Farm Payroll Employment by Place of Work, Deschutes County

Industry	November, 2002	Percent of Total
Total Non-Farm Payroll Employment ⁽¹⁾	53,720	100.0%
Goods Producing ⁽²⁾	10,040	18.7%
Service Producing ⁽³⁾	43,680	81.3%
Manufacturing, Total	5,770	10.7%
Durable Goods	4,690	8.7%
Lumber and Wood Products	1,880	3.5%
Other Durable Goods	2,810	5.2%
Non-Durable Goods	1,080	2.0%
Food and Kindred Products	180	0.3%
Other Non-durable Goods	900	1.7%
Non-Manufacturing, Total	47,950	89.3%
Construction and Mining	4,270	7.9%
Transportation, Communication, Utilities	2,330	4.3%
Wholesale and Retail Trade	14,390	26.8%
Finance, Insurance, and Real Estate (FIRE)	3,270	6.1%
Services	15,860	29.5%
Government	7,830	14.6%
Federal	930	1.7%
State	730	1.4%
Local	6,170	11.5%

(1) Oregon Employment Department, Workforce Analysis, November 2002. Non-farm payroll data are based on 1987 Standard Industrial Classification Manual. The data are by place of employment. People working multiple jobs are counted more than once. Data excludes self-employed, volunteers, unpaid family workers, domestics, and persons involved in labor disputes.

(2) Goods producing, durable and non-durable goods includes all manufacturing sector plus the construction and mining portion of the non-manufacturing sector.

(3) Service producing represents all non-manufacturing minus construction and mining

2.0 Sector-level Employment Forecasts

The Oregon Employment Department provides region-wide employment forecasts by sector until the year 2010. These demonstrate anticipated growth levels overall, and by industry.

Table 3 shows employment payroll in year 2000, 2010, the change, percent of change, and annual average growth rates by industry.

This analysis assumes that the Annual Average Growth Rate of 1.32%/year approximates the employment growth in Region 10 between 2010 and 2025. Since no other forecasts by industry are available, these represent a suitable approximation of employment growth by industry. Likewise, it is assumed that Deschutes County non-farm payroll employment will grow at an annual rate of 1.32%/year for the next 25 years.

Table 3: Region 10: Crook, Deschutes, Jefferson Counties Non-Farm Payroll Employment Forecasts by Industry

Industry	2000	2010	Change	% of Change	Annual Average Growth Rate
Total Non-Farm Payroll Employment	65,210	74,310	9,100	100%	1.32%
Goods Producing ⁽²⁾	13,990	14,150	160	1.76%	0.11%
Service Producing ⁽³⁾	51,220	60,160	8,940	98.24%	1.62%
Manufacturing, Total	9,300	9,450	150	1.65%	0.16%
Durable Goods	8,310	8,450	140	1.54%	0.17%
Lumber and Wood Products	5,030	4,810	-220	-2.42%	-0.45%
Other Durable Goods	3,280	3,640	360	3.96%	1.05%
Non-Durable Goods	990	1,000	10	0.11%	0.10%
Food and Kindred Products	140	130	-10	-0.11%	-0.74%
Other Non-durable Goods	850	870	20	0.22%	0.23%
Non-Manufacturing, Total	55,910	64,860	8,950	98.35%	1.50%
Construction and Mining	4,690	4,700	10	0.11%	0.02%
Transportation, Communications, Utilities	2,430	2,660	230	2.53%	0.91%
Wholesale and Retail Trade	17,500	20,840	3,340	36.70%	1.76%
FIRE	4,030	4,900	870	9.56%	1.97%
Services	16,160	19,640	3,480	38.24%	1.97%
Government	11,100	12,120	1,020	11.21%	0.88%
Federal	1,400	1,290	-110	-1.21%	-0.82%
State	1,070	1,190	120	1.32%	1.07%
Local	8,630	9,640	1,010	11.10%	1.11%

(1) Source: Employment Projections by Industry 2000 -2010, Oregon and Regional Summary Oregon Employment Department, August, 2001

(2) Goods producing, durable and non-durable goods includes all manufacturing sector plus the construction and mining portion of the non-manufacturing sector.

(3) Service producing represents all non-manufacturing minus construction and mining

Table 3 shows that non-manufacturing payroll employment growth, particularly in the Wholesale and Retail Trade, Finance, Insurance, and Real Estate (FIRE), and Services categories is expected to be the principal source of employment growth in the region. Manufacturing employment growth is expected to be more than a tenth of non-manufacturing, with losses in timber and the production of food and kindred products contributing to this low growth.

Table 4 presents the long-term employment forecast based on the 1.32%/year growth rate estimated between the years 2000-2010. With this rate of yearly non-farm payroll employment growth, Region 10 would expect to add 25,254 new non-farm jobs between 2000 and 2025. This assumes the non-farm payroll employment growth between years 2000-2010 will approximate the non-farm payroll employment growth between years 2010-2025.

Table 4: Long-Term Non-Farm Employment Projections

Region	2000 Employment (1)	2010 Employment (1)	AAGR 2000- 2010 (1)	Estimated 2025 Employment (2)	Estimated Employment Growth 2000-2025
Region 10	65,210	74,310	1.32%	90,464	25,254

(1) Source: Employment Projections by Industry 2000 -2010, Oregon and Regional Summary Oregon Employment Department, August, 2001

(2) Source: Projection based on applying AAGR to 2010 employment

Table 5 illustrates the population growth in Region 10 (Crook, Deschutes, Jefferson counties), and the City of Sisters. While the City of Sisters represents a relatively small share of the total population in Region 10, its share of the population is expected to increase from 0.64% of the total in year 2000, to 1.66% of the total in year 2025. This is due to the City of Sisters population growing relatively faster than the population of Region 10.

Table 5: Long-Term Population Forecasts

Region	2000	2005	2010	2015	2020	2025
Region 10 Population (1)	148,778	172,959	195,821	216,653	235,951	250,714
Sisters UGB Population (2)	959	1,556	2,200	2,757	3,394	4,167
Sisters UGB Population as % Region 10 Pop.	0.64%	0.90%	1.12%	1.27%	1.44%	1.66%

(1) State of Oregon Office of Economic Analysis, DAS, January, 1997.

Note: Since 1997, OEA has revised and reduced its non-farm employment growth estimates.

(2) Long-term Coordinated Population Forecasts for Deschutes County, Draft Estimates, January, 2003

Table 6 predicts the level of employment growth in the City of Sisters until the year 2025. These estimates are based on assumptions. First, that Region 10 employment until 2025 will grow at a rate of 1.32%/year, as it is anticipated to do between years 2000-2010. Second, population growth for the region and City of Sisters will be as anticipated by the coordinated OEA population forecasts.

The methodology used here is a simple “gravity model”. This model assumes that a city will attract employment relative to a given region based on its relative size. This uses population as an indicator or predictor for employment growth. This is appropriate for Sisters because other direct forecasts are unavailable and it accounts for the City’s increasing share of the region’s population growth.

Table 6: Long-Term Non-Farm Additional Employment for the City of Sisters

Region	2000	2005	2010	2015	2020	2025
Sisters UGB Population as % of Region 10 Population ⁽¹⁾	0.64%	0.90%	1.12%	1.27%	1.44%	1.66%
Region 10 Employment ⁽²⁾	65,210	69,629	74,310	79,346	84,723	90,464
Sisters Employment as % of Regional Employment	420	626	835	1,010	1,219	1,504
Additional Employment in Sisters (5 Year Increments)	NA	206	208	175	209	285
Additional Employment in Sisters Between 2000-2025		1,083				

(1) See Table 5

(2) See Table 4

Table 6 illustrates expected additions to non-farm payrolls in five-year increments. This represents the additional job growth expected in the city until year 2025. Table 7 adds this growth to the existing employment levels determined based on business licenses maintained by the City of Sisters. City Business licenses are required to provide the number of employees, type of business, and location. From this information, businesses located in Sisters, the total number of employees, and types of businesses were determined. In year 2000, 1,636 people were employed in the City of Sisters. This does not count businesses located outside of Sisters, doing business in Sisters. Table 7 takes year 2000 employment of 1,636 and adds the additional employment growth predicted in 5-year increments as shown in Table 6.

Table 7: Long-Term Non-Farm Employment Forecasts for the City of Sisters

Region	2000	2005	2010	2015	2020	2025
Reported Employees (Business Licenses Plus Public) ⁽¹⁾	1,636					
Additional Employment in Sisters (5 Year Increments)	NA	206	208	175	209	285
Total Employees by Year	1,636	1,842	2,051	2,225	2,434	2,719
Sisters Job Growth from 2000-2025		1,083				

(1) Source: City Business Licenses reporting number of employees plus estimated 238 Public employees determined via interviews in 2003.

Table 8 depicts the differences and similarities between the percentages of non-farm employment in different industries by area. Information for the City of Sisters is based on type of business as indicated on city issued business licenses. Data for public sector employment was obtained by interviews since business licenses are not maintained for these entities. Strikingly, the employment by industry for City of Sisters is very similar to Deschutes County, and is not closely aligned with the Region 10 profile.

Table 8: Industry Comparisons between Region 10, Deschutes County, City of Sisters

Industry	Region 10 ⁽¹⁾	Deschutes County ⁽²⁾	Sisters UGB ⁽³⁾	2002 Estimated Employment by Industry in Sisters
Total Non-Farm Payroll Employment	100%	100.0%	100%	1,633
Goods Producing ⁽²⁾	1.8%	18.7%	18.8%	307
Service Producing ⁽³⁾	98.2%	81.3%	81.2%	1,326
Manufacturing, Total	1.65%	10.9%	12.12%	198
Non-Manufacturing, Total	98.35%	91.0%	87.88%	1,435
Construction and Mining	0.1%	8.1%	6.7%	109
Transportation, Communications, Utilities	2.5%	4.4%	0.9%	15
Wholesale and Retail Trade	36.7%	27.3%	40.2%	656
FIRE	9.6%	6.2%	7.3%	119
Services	38.2%	30.1%	18.2%	298
Government	11.2%	14.9%	14.6%	238
Federal	-1.2%	1.8%	4.0%	65
State	1.3%	1.4%	1.3%	22
Local	11.1%	11.7%	9.2%	151

(1) Source: Employment Projections by Industry 2000 -2010, Oregon and Regional Summary Oregon Employment Department, August, 2001.

(2) Oregon Employment Department, Workforce Analysis, November 2002.

(3) Based on 2002 Estimated Employment by Industry in Sisters.

Note: Goods producing, durable and non-durable goods includes all manufacturing sector plus the construction and mining portion of the non-manufacturing sector. Service Producing represents all non-manufacturing minus construction and mining

Table 9 estimates the amount of new non-farm payroll employment by industry for the anticipated 1,083 new jobs to be created by year 2025. The jobs are allocated by industry as shown in Table 8, and assume the current distribution of employment in 2002 is an appropriate estimator for the future employment/industry distribution. Again, these assumptions are necessary absent of specific forecasts for the City of Sisters. Table 9 shows that of the 1,083 new employees in the City by year 2025, 880 are expected to work in Service Producing industries, while 204 are expected to work in Goods Producing industries. Most of the non-manufacturing job growth is expected to be in Wholesale and Retail Trade, followed by services and government.

Table 9: Estimated Employment by Industry in the City of Sisters

Industry	Percent ⁽¹⁾	Number of New Employees 2025
Total Non-Farm Payroll Employment ⁽¹⁾	100.0%	1,083
Goods Producing ⁽²⁾	18.8%	204
Service Producing	81.2%	880
Manufacturing, Total	12.12%	131
Durable Goods ⁽²⁾	10.0%	108
Non-Durable Goods ⁽²⁾	2.1%	23
Non-Manufacturing, Total	87.9%	952
Construction and Mining	6.7%	72
Transportation, Communication, Utilities	0.9%	10
Wholesale and Retail Trade	40.2%	435
Finance, Insurance, and Real Estate (FIRE)	7.3%	79
Services	18.2%	198
Government	14.6%	158
Federal	4.0%	43
State	1.3%	15
Local	9.2%	100

(1) Total Employment of 1,083 is based on Table 7, percentages are based on Table 8 "Sisters UGB" column.

(2) Based on Deschutes County distribution between durable and non-durable goods since this information is not available for the City of Sisters.

3.0 Employee/acre Ratios by Employment Sector

Table 10 below shows the amount of space used by different types of employment. This data was obtained from similar analysis done for Prineville and Crook County, and was noted as an industry standard by a Department of Land Conservation and Development regional representative. The report states that the table depicts "typical square foot per employee and land coverage ratios by land use and industry classification. These numbers are based on typical nationwide figures and modified slightly downward for the Prineville area." (p. 55, *Buildable Land Analysis and Future Land Needs Analysis*, May 4, 2001, Benkendorf Associates Corporation).

Coverage ratios refer to the amount of area on a site that is taken up by a structure. For example, 20% is used for industrial and office land uses, while 25% is used for retail. The number of employees per acre is calculated by determining the amount of land used as building space and dividing this by the amount of floor area per job. Based on City of Sisters Business Licenses in 2002, the average employees/acre ratio for all jobs in the City is 40 employees/acre. This calculation assumed a coverage ratio of 20%.

Table 10: Land Use and Industry Type Employees per Acre

Land Use and Industry Type	Floor Area Per Job (sq. ft.)	Coverage Ratio	Employees per Acre
Industrial		20%	
Manufacturing	750		11.62
Construction and Mining	750		11.62
Transportation, Communication and Utilities	1,400		6.22
Wholesale Trade	1,100		7.92
Retail Trade	2,500		3.48
Financial, Insurance, and Real Estate	350		24.89
Services	350		24.89
Government	300		29.04
Office		20%	
Manufacturing	225		38.72
Construction and Mining	225		38.72
Transportation, Communication and Utilities	250		34.85
Wholesale Trade	225		38.72
Retail Trade	225		38.72
Financial, Insurance, and Real Estate	225		38.72
Services	250		34.85
Government	200		43.56
Retail		25%	
Transportation, Communication and Utilities	300		36.30
Retail Trade	500		21.78
Financial, Insurance, and Real Estate	300		36.30
Services	300		36.30

Source: Hobson Johnson and Associates and the Benkendorf Associates Corp., from Crook County Buildable Land Analysis and Future Land Needs Analysis, The Benkendorf Associates Corp.

4.0 Projected Land Needs

Table 11 applies employee per acre ratios by industry to the number of new jobs created by industry to determine the amount of land required by industry. Important here is the capture factor, or the amount of land by type (industrial, office, retail) that is required by type of industry (Manufacturing, Retail Trade, Government, etc.). The capture factor for each industry will sum to 100 percent. For example, the Manufacturing industry typically requires 85% of its land use in Industrial lands, and 15% in Office land uses. The capture factor is used to determine the number of jobs by land use and industry. Finally, the number of new jobs by industry is divided by employee per acre ratios to result in land required by land use type. A vacancy rate of 10% is used to consider structural vacancy.

This analysis predicts that a total of 56.62 net buildable acres of Industrial, Office, and Retail land will be demanded in the Sisters UGB by 2025. By adding in needed space for public infrastructure (approximated at 25%), 70.78 gross acres of industrial, office, and retail land is required. Considering a vacancy rate of 10%, 62.29 acres of Net Buildable land, or 77.86 gross acres of economic lands are demanded. Accounting for a vacancy rate of 10%, an estimated 34.09 net buildable acres or 42.74 gross acres of industrial land is demanded. An estimated 28.09 net buildable acres or 35.11 gross acres of office and retail land is demanded.

Table 11: Projected Land Needed by Industry, City of Sisters, 2025.

Land Use and Industry Type	New Jobs 2000-2020	Capture Factor	New Jobs 2000-2020 (adjusted)	Employees Per Acre	Land Required (Net Acres)
Total (Industrial, Office, Retail)	1,083	NA	NA	NA	56.62
Total Plus Vacancy of 10%					62.29
Industrial					
Manufacturing	131	85%	112	11.62	9.61
Construction and Mining	72	60%	43	11.62	3.73
Transportation, Communication and Utilities	10	60%	6	6.22	0.96
Wholesale Trade	24	85%	20	7.92	2.58
Retail Trade	411	10%	41	3.48	11.79
Financial, Insurance, and Real Estate	79	10%	8	24.89	0.32
Services	198	25%	49	24.89	1.99
Government	158	2%	3	29.04	0.11
Total Industrial					31.09
Total Industrial Plus Vacancy of 10%					34.19
Office					
Manufacturing	131	15%	20	38.72	0.51
Construction and Mining	72	40%	29	38.72	0.75
Transportation, Communication and Utilities	10	30%	3	34.85	0.09
Wholesale Trade	24	15%	4	38.72	0.09
Retail Trade	411	2%	8	38.72	0.21
Financial, Insurance, and Real Estate	79	80%	63	38.72	1.63
Services	198	25%	49	34.85	1.42
Government	158	35%	55	43.56	1.27
Total Office					5.96
Total Office Plus Vacancy of 10%					6.56
Retail					
Transportation, Communication and Utilities	10	10%	1	36.30	0.03
Retail Trade	411	88%	362	21.78	16.61
Financial, Insurance, and Real Estate	79	10%	8	36.30	0.22
Services	198	50%	99	36.30	2.72
Total Retail					19.57
Total Retail Plus Vacancy of 10%					21.53

5.0 Comparison of Land Demanded and Land Supply

There are 37.3 net buildable acres of vacant C and C-HC designated lands inside the Sisters UGB. Adding 11.9 net buildable acres of re-developable and 39.8 acres of developable acreage of developed lands, a total of 89 acres of buildable C and C-HC lands are inside the Sisters UGB. Since only 28.09 net buildable acres of office and retail land is demanded, there is a surplus of commercial land of approximately 61 acres. Even without considering the re-development of partially developed land, there is sufficient vacant and re-developable land to accommodate future demand for commercial lands.

There are 43.9 net buildable acres of vacant LI designated lands inside the Sisters UGB. Adding 3.3 net buildable acres of re-developable and 17.0 acres of developable acreage of developed lands, a total of 64.2 acres of buildable light industrial (LI) lands are available inside the Sisters UGB. An estimated 34.19 net buildable acres of industrial land is demanded inside the Sisters UGB until the year 2025. A surplus of 30 acres of net buildable industrial land is predicted based on anticipated supply and demand of industrial lands until year 2025. There is a sufficient supply of vacant acreage alone to satisfy anticipated demand, without considering re-developable and partially developed parcels.