

Urban Growth Management Study

Bend Case Study

Prepared by
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with
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November 1990

Oregon Department of Land Conservation and Development

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BEND CASE STUDY
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MANAGEMENT STUDY

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CHAPTER ONE INTRODUCTION

A. PURPOSE

In June 1989 the Oregon State Legislature approved funds for the Oregon Department of Land Conservation and Development (DLCD) for an Urban Growth Management Study to (1) evaluate the effectiveness of the growth management policies of Oregon's statewide planning program, and (2) determine how they could be improved. One component of that larger study is this study of urban growth in four urban areas.

In April 1990, DLCD hired ECO Northwest, a consulting firm in land-use planning and economics, to study issues related to urban growth in the four case-study areas. ECO's previous report (*Case Studies, Phase 1: Methodology*, May 1990) describes in more detail the purposes of the study and the issues it is to address.

This report presents our analysis of urban growth in the Bend case study area. This report was modified after considering comments from planners, policy makers, and other interested citizens in the Bend case study area.

B. METHODS

For a detailed description of the issues this case study is designed to evaluate, and the methods for making that evaluation, see the previous reports that were part of this project: *Case Studies, Phase 1: Methodology*, May 1990; and *Supplement to the Methodology Report*, July 1990. For details on specific methods and sources used for this case study, see the Appendix to this report.

This case study defines the Bend case-study area to include all of Deschutes County, including the cities of Sisters and Redmond, but excluding the unincorporated areas within their UGBs. We analyzed data describing urban growth in the Bend area by city and county. To describe growth across all parts of the Bend case-study area, we analyzed data that describe urban growth in four analysis areas: (1) urban, (2) urbanizable, (3) urban fringe, and (4) exurban.

To define urban and urbanizable areas within the Bend Urban Growth Boundary (UGB), we used Deschutes County assessment data that estimate acreage and assessed value of improvements by transportation zone (104 transportation zones in the Bend UGB). We reviewed a distribution of assessed value of improvements per acre in 1990 to determine if any clear breaks existed in the density measure. We determined that about \$40,000 of assessed improvements per acre provided a reasonable point at which to divide urban from urbanizable land. Approximately 40 percent of the tax maps fell above this mark. Finally, we compared our determinations with existing zoning and land use to see if any anomalies existed. We have also analyzed some growth data for city and county land within the Bend UGB.

We defined the Bend urban fringe generally as all Bend transportation zones outside the Bend UGB. In cases where the UGB cut through a transportation zone, we only included those tax lots which fell outside the UGB. We defined the exurban area as all areas that met all of the following criteria: (1) outside the Bend UGB, (2) outside other urban growth boundaries (i.e., Sisters and Redmond), (3) outside the Bend urban fringe, and (4) within Deschutes County.

Our analysis focuses on changes in urban growth from 1985 through 1989. We chose this five-year period because (1) it represents the period after acknowledgement of comprehensive plans by LCDC when most growth occurred, and (2) we wanted to have comparable data for all case studies. We organize to address the seven urban growth management issues identified by DLCD.

C. HOW TO READ THIS REPORT

Readers not familiar with the Bend area should begin with **Chapter Two**, which gives a brief overview of growth in the area. Readers wanting a summary of the findings should go to **Chapter Three**, which describes changes in three classes of issues of concern to DLCD: (1) land development, (2) livability, and (3) infrastructure investment between 1985 and 1989.¹ The data in Chapter Three are all contained in more detail in an **Appendix**, which describes sources, methods, and our analysis of all the data we collected. The full Appendix will probably be of interest only to a technical audience; others may want to scan it or turn to it for more detail about issues of interest to them.

¹We provide these three classifications to help organize the report. DLCD's concerns remain the individual issues that compose these classes, not the classes themselves.

CHAPTER TWO CASE-STUDY AREA PROFILE

In this chapter we provide an overview of the Bend case-study area. We describe the following key characteristics that affect growth in the Bend case study area: (1) jurisdictions included in this case study, (2) size (e.g., population, employment, and land area), (3) base economic activities; and (4) historic population and employment growth.

A. BOUNDARIES

This report defines the Bend case study area as all of Deschutes County². This study area was defined as those regions of Deschutes County that are within commuting distance of Bend. The study area also includes the unincorporated communities of Sunriver, Black Butte, and Eagle Crest. Our analysis of growth on the urban fringe is for Bend only.

B. SIZE

Deschutes County covers 3,060 square miles, 10th among Oregon's 36 counties. As of 1989, the Portland State Center for Population Research and Census (CPRC) estimated that Deschutes County had a population of about 70,600, 10th among Oregon counties. Deschutes County's overall population density in 1989 was about 23 persons per square mile. By the year 2000, Deschutes County's population is expected to grow to about 100,000. Bend had a population of just over 17,500 in 1989, 14th among Oregon cities.

According to Oregon's State Employment Division, Deschutes County had an annual average employment of about 34,330 in 1988. Accurate employment data for Bend are not available.

C. ECONOMIC BASE

Deschutes County's primary economic activities have traditionally been lumber and wood products, agriculture, and tourism. Although the lumber and wood products' industry continues to be the county's primary manufacturing activity, the long-term outlook for this industry is clouded by raw material constraints and continuing automation. The county's agriculture industry has grown over the past decade due to improved markets for hay, grain, and cattle, along with dramatic growth in horse and llama breeding. The tourism industry also has a major impact on the economy of Deschutes County. Due in large part to the presence of year-round visitor facilities (e.g. Mt. Bachelor and Sunriver) the county has attracted increasing numbers of visitors (in both winter and summer) over the past decade.

Since 1983, Deschutes County's economy has entered a period of sustained growth, with employment gains in all sectors. These gains have become increasingly concentrated in trade, services, finance, and construction. Although the short-term outlook suggests continuing economic growth in Deschutes County over

² For our analysis of development inside and outside UGBs, data are not available for the area outside the city limits of Sisters and Redmond but within their UGBs (i.e., unincorporated areas within the Sisters and Redmond UGBs).

the next 5-10 years (especially in tourism, light manufacturing, and retail services), potential shortages in low and medium income housing may limit accompanying population growth in the area³.

D. GROWTH INDICATORS

Table 2.1 shows historic population and employment growth in Bend and Deschutes County (historic employment data are not available for Bend). Both Bend and Deschutes County have experienced a higher annual population growth rate over the past nine years than has the state as a whole. Deschutes County's total employment also grew faster than the state as a whole between 1980 and 1988.

**TABLE 2-1
HISTORIC POPULATION AND EMPLOYMENT GROWTH FOR
BEND AND OREGON, 1980-89**

Jurisdiction	1980	1988 Employment	1989 Population	Average Annual Growth Rate
Population				
Bend	17,263	NA	19,510	1.4%
Deschutes County	62,142	NA	70,600	1.4%
Statewide	2,633,156	NA	2,791,100	0.8%
Employment				
Deschutes County	27,340	34,330	NA	2.8%
Statewide	1,188,000	1,343,000	NA	1.5%

Source: Population Estimates for Oregon 1980-89, Portland State Center for Population Research and Census; Oregon Resident Labor Force, Oregon Employment Division, 1990.

NA - Not Applicable

³Business and Employment Outlook, State Employment Division, 1990.

CHAPTER THREE FINDINGS AND CONCLUSIONS

This chapter presents key findings and conclusions about (1) land development, (2) livability, and (3) infrastructure investment issues in the Bend case study area. See the Appendix for a more detailed description of the data that led us to the conclusions.

A. DEVELOPMENT ISSUES

DEVELOPMENT OUTSIDE URBAN GROWTH BOUNDARIES VERSUS DEVELOPMENT INSIDE URBAN GROWTH BOUNDARIES

About 63% of the 4,728 single and multiple family dwelling units built or placed in the Bend study area from 1985 through 1989 were located outside of the Bend UGB. See Table 3-1 for a breakdown of these units by type and by location.

About 63% of the 4,300 single family dwelling units built or placed in the Bend study area from 1985 through 1989 were located outside of UGBs. Of these, about 19 percent were constructed on resource (farm and forest) lands, and 81 percent in rural exceptions areas.

Less than 1% of the 428 dwelling units built on land zoned for multiple family use in the Bend case study area from 1985 through 1989 were located outside of UGBs. Our data indicate that about 87 percent of the 425 multiple family dwelling units constructed inside UGBs were built within the Bend UGB at about 13 units per acre.

About 17% of the 1,775 subdivision lots approved in the Bend case study area between 1985 and 1989 occurred outside the Bend UGB. This includes about 40 lots in the resort area of Sunriver.

About 18.7 percent of the 203 industrial and commercial developments constructed between 1985 and 1989 occurred outside the Bend UGB.

The potential exists to develop about 12,000 additional dwelling units in Deschutes County outside UGBs on vacant lots in rural residential exceptions areas. This figure does not include (a) development potential on resource lands, or (b) the potential for further division of land in exceptions areas.

TABLE 3-1
BUILDING AND LAND DIVISIONS
1985-89

Analysis Area	Residential				Subdivision Lots ¹		Commercial/Industrial	
	Single-Family Units		Multiple Family Units		# of Lots	%	# of Com/Ind Developments	%
	# of Units	%	# of Units	%				
Inside UGBs ^a	1,598	37.2	425	99.3	1,476	83.2	165	81.3
Inside Bend UGB ^b	1,445	33.6	377	88.0	1,476	83.2	165	81.3
Bend Urban	310	7.2	164	38.3	762	42.9	80	39.4
Bend Urbanizable	1,135	26.4	213	49.8	714	40.2	85	41.9
Inside Bend City Limits	897	23.0	304	71.0	NA	-	77	37.4
Outside Bend City Limits	548	12.7	73	17.1	NA	-	23	11.2
Cities of Sisters and Redmond	153	3.6	48	11.2	NA	-	NA	-
Outside UGBs	2,702	62.8	3	0.7	299	16.8	38	18.7
Urban Fringe	189	4.4	3	0.7	75	4.2	0	0.0
Exception Areas	124	1.1	3	0.7	75	4.2	0	0.0
Resource Areas	65	3.3	0	0.0	0	0.0	0	0.0
Exurban	2,513	58.4	0	0.0	224	12.6	38	18.7
Exception Areas	2,074	48.2	0	0.0	151	10.8	38	18.7
Residential Areas	1,700	39.5	0	0.0	NA	-	NA	-
Destination Resorts	349	8.1	0	0.0	40 ^c	-	NA	-
Rural Service Comm.	25	0.6	0	0.0	NA	-	NA	-
Resource Areas	439	10.2	0	0.0	33	1.9	0	0.0
Total	4,300	100.0	428	100.0	1,775	100.0	203	100.0

Source: Deschutes County Assessment Records.

NA - Not Available

¹ Includes subdivision lots inside the Bend City Limits approved between 1982-90

^a Includes only dwelling units constructed inside the Sisters and Redmond city limits; no estimates are available for the rest of the UGB for these two cities.

^b Data for inside the Bend UGB is presented in two ways: urban/urbanizable and city/unicorporated. Both sum to the same total.

^c According to the Deschutes County Planning Director, there were no new subdivision lots created in either Eagle Crest or Black Butte; there were an estimated 40 lots created in Sunriver from 1985 through 1989.

DEVELOPMENT OUTSIDE OF AND ADJACENT TO URBAN GROWTH BOUNDARIES

Of the single-family dwelling units built or sited outside UGBs in the Bend case study area, about 7% occurred in the urban fringe around the Bend UGB. (We defined the fringe as Bend transportation zones contiguous to the UGB). Of 189 single family residential building permits issued for sites in the urban fringe, 34 percent (65) were on resource lands.

Of the subdivision lots developed outside UGBs in the Bend area, about 25% occurred in the urban fringe around the Bend UGB. Of the 75 lots developed in the urban fringe, all were lot sizes greater than two acres, and with 89% on lots of five acres or larger.

The three multiple family units developed outside UGBs in the Bend study area were built in the urban fringe around the Bend UGB.

Large lot zoning (5-10 acre minimum lot size) has reduced the negative affects of rural residential development on efficient future urbanization. Only 15 lots were created through the partitioning process and these lots averaged 10 acres.

The large number of dwellings permitted on resource lands (65) has limited the effectiveness of resource zoning in preserving land for future efficient urbanization. Because Deschutes County has changed its regulations making it more difficult to site residences on land with resource zoning and because such lots are largely developed, this trend is likely to decline.

TABLE 3-2

**RESIDENTIAL LAND DIVISIONS IN THE BEND URBAN FRINGE
1985-89**

Analysis Area	Lot Size				Average Lot Size (ac)
	< 1 Acre	1-2 Acres	2-5 Acres	> 5 Acres	
Partitions	13	0	9	15	10.1
Residential Resource Zones	0	0	0	9	56.2
Residential Exceptions Areas	13	0	9	6	4.2
Subdivisions	0	0	8	67	4.8
Residential Resource Zones	0	0	0	0	
Residential Exceptions Areas	0	0	8	67	4.8

Source: Deschutes County Planning Department, City of Bend Planning Department.

DEVELOPMENT IN URBANIZABLE AREAS

Of the 1,822 single family and multiple family residential dwellings constructed inside the UGB between 1985 and 1989, 74% (1,348) occurred in urbanizable areas.

Of the 1,445 single family residential dwelling units constructed on sites inside the Bend UGB, 78% (1,135) occurred in urbanizable areas.

Of the 377 dwelling units constructed on land zoned for multiple family are inside the Bend UGB, about 56% (213) occurred in urbanizable areas.

Residential development on land zoned for multiple family housing accounted for about 21% of all building permits approved between 1985 and 1989 in the urbanizable areas.

TABLE 3-3

**ACTUAL VS. ALLOWABLE DENSITY OF RESIDENTIAL DEVELOPMENT
Inside the Bend UGB, 1985-89
Densities in Units per Acre**

Analysis Area	Single-Family		
	Actual Density	Allowable Density	% of Allowable
Partitions			
Bend Urban Area	-	-	
Bend Urbanizable Area	0.76	3.88	19.6
Bend UGB	0.76	3.88	19.6
Bend Urban Fringe	0.29	0.15	193.3
Subdivisions			
Bend Urban Area	2.5	4.50	39.8
Bend Urbanizable Area	1.6	4.34	60.8
Bend UGB	2.0	4.90	40.1
Bend Urban Fringe	0.33	0.10	330.0

Source: Deschutes County Planning Records; City of Bend Planning Records.

Single family lots (in subdivisions) developed from 1985-89 averaged about 1.6 lots per net acre in the urbanizable area.

Actual development for single family lots in urbanizable areas was about 37% of allowable densities. Table 3-2 shows the distribution by analysis areas.

DEVELOPMENT IN URBAN AREAS

Of the 1,445 single family residential buildings constructed inside the UGB, about 21% occurred in urban areas.

Of the 377 total multiple family dwelling units constructed inside the Bend UGB, about 43% occurred in urban areas.

Housing built on land zoned for multiple family use accounted for about 43% of all dwelling units approved between 1985 and 1989 in the urban areas.

Single family units (in subdivisions) developed from 1985-89 averaged about 2.5 lots per net acre in the urbanizable area--about 48% of allowable densities. Table 3-3 shows the distribution by analysis area.

For all land inside the UGB (urban plus urbanizable):

Housing development on land zoned for multiple family use accounted for about 21% of all new units between 1985 and 1989. The average density of multiple family developments was about 13 units per acre within the Bend city limits, or about 65% of allowable density. Available site plan data indicates that there were no multiple family units constructed in the county.

Single family units were built in subdivisions at an average of about 40% of allowable density, or about 2.0 dwelling units per acre.

B. LIVABILITY ISSUES

Below we address the preservation of urban livability issue by describing changes in housing affordability, traffic congestion, and air quality in the Bend case study area between 1985 and 1989.

The average home sales price in Bend increased by about 48% between 1985 and 1989. The average home selling price in Bend increased from \$45,594 to \$67,583 between 1985 and 1989, an increase of about 48 percent. This increase was significantly more than experienced in the other case study areas and the state as a whole. Between 1986 and 1989, average home prices increased by a total of about 25 percent. By comparison, the median family income for Deschutes County increase by about 18 percent over the same period.

Average multiple family rental rates in the Bend area increased by about 31% between 1986 and 1988. The average monthly rent per multi-family dwelling unit in the Bend area grew from \$248 to \$325 between 1986 and 1988, resulting in an increase of about 31 percent. This increase was slightly more than the state as a whole over the same period. According to the Bureau of Economic Analysis, median family income in Deschutes County increase by a total of about 8 percent between 1986 and 1988. This increase was about 18 percent less than the increase in rental rates in the Bend area.

Traffic congestion is increasing in the Bend area. Our analysis shows that level of service decreased at two major Bend area intersections between 1982 and 1989. Average daily traffic volumes also increased between 22 and 40 percent at these intersections. The level of service data show that congestion increased along Highway 97 in Bend between 1982 and 1989.

Air quality in the Bend area continues to meet ambient air quality standards. Although emissions in Deschutes County appear to have increased over the past five years, air quality in the Bend area continues to meet or exceed state and federal ambient air quality standards.

Total acreage of park land administered by the City of Bend increased by 17.6 percent between 1985 and 1989. Total park land acreage increased from 1,776 acres to 2,088 between 1985 and 1989.

APPENDIX DESCRIPTION AND EVALUATION OF DATA

A. PREFACE

This appendix describes and evaluates the data we used to address urban growth issues in the Bend case study area. We focus on data that describe changes in land development, livability, and infrastructure investment between 1985 and 1989.

We organize the appendix by data source. For each source we describe the data source, evaluate its reliability, and show the data. We organize the data into six categories, corresponding to the six sections of this appendix:

- 1.0 Data describing historic socioeconomic conditions
- 2.0 Data describing growth management policies
- 3.0 Data describing changes in land development
- 4.0 Data describing changes in livability indicators
- 5.0 Data describing infrastructure investment
- 6.0 Data describing residual development potential

In Chapter Three we use the data in this Appendix to develop conclusions about the amount and type of urban growth that occurred between 1985 and 1989 in the Bend case study area.

1.0 SOCIOECONOMIC INDICATORS

1.1 SOURCE *Population Estimates for Oregon 1980-89*, Portland State University Center for Population Research and Census, 1990; *Business and Employment Outlook*, State Employment Division, 1990.

Description Population estimates for each case study area and Oregon for the years 1980 and 1989 (by Portland State University's Center for Population Research and Census (CPRC). Estimates are driven by area births, deaths, and net migration. Table A-1 shows historic population growth for the Bend case study area and other case study areas across Oregon. Employment estimates for each case study area and Oregon for the years 1980 and 1988. Table A-2 shows historic employment growth for Deschutes County and counties within other case study areas across Oregon.

Evaluation The population estimates by the CPRC are the best available. Although the CPRC does not actually count people, it periodically updates the data to ensure a close approximation to actual population trends. The 1980 Census of Population is used as a base. Employment data are extrapolated from the Bureau of Economic Analysis (BEA), U.S. Department of Commerce, and Oregon unemployment insurance files. The BEA estimates are the best available for time-series analysis. The BEA's employment data for each county are estimated jointly, and thus are comparable with one another.

ANALYSIS Tables A-1 and A-2 below show that the total population and employment of Deschutes County grew at faster rates between 1980 and 1988 than for the state as a whole. Bend's population also grew at an annual rate that was higher than the state as a whole between 1980 and 1988.

TABLE A-1
HISTORIC POPULATION GROWTH
1980-89

Jurisdiction	1980	1989	% Change
Bend	17,263	19,510	13.1
Deschutes County ¹	62,142	70,600	13.6
Other Case Study Areas			
Portland	368,139	432,175	17.3
Washington, Clackamas, and Multnomah	1,050,418	1,114,500	8.7
Medford	39,746	45,290	13.9
Jackson County	132,456	145,000	9.4
Brookings	3,384	4,465	31.9
Curry County	16,992	19,200	12.9
Statewide Total	2,633,156	2,791,000	5.9

Source: Population Estimates for Oregon 1980-89, Portland State Center for Population Research and Census, 1990.

¹ Preliminary figures from the 1990 Census indicate Deschutes County population was 76,000. County officials believe that the Census figure may be low due to over-counting of second homes.

TABLE A-2
HISTORIC EMPLOYMENT GROWTH
1980-88

Jurisdiction	1980	1988	% Change
Deschutes County	27,340	34,330	25.6
Other Case Study Areas			
Portland Metro	595,600	618,200	3.8
Jackson County	55,560	66,470	17.5
Curry County	6,230	8,730	40.1
Statewide Total	1,188,000	1,343,000	13.1

Source: Oregon Resident Labor Force, State Employment Division, 1990.

2.0 GROWTH MANAGEMENT POLICIES AND REGULATIONS

2.1 SOURCES Interviews with John Hossick, Bend Planning Director, George Reed, Deschutes County Planning Director, and Paul Blikstad, Deschutes County Associate Planner. The Bend General Plan and zoning ordinance, and the Deschutes County zoning ordinance were also reviewed.

ANALYSIS The Bend Urban Growth Boundary was acknowledged by the Land Conservation and Development Commission in 1981. As a result of the LCDDC acknowledgment process, the Bend UGB was reduced in size and large-lot zoning was applied to land that had been in the original UGB. Two types of residential zones were applied to "exceptions areas" in the Urban Fringe: (1) the UAR 10 zone (10 acre minimum) was placed on large tracts of undeveloped land; and (2) the RS 2.5 (Suburban Residential) zone was applied to areas that had been partially developed.

Outside the UGB, development patterns were largely established prior to zoning in the 1960s and early 1970s. At the time of acknowledgement, Deschutes County had over 15,000 buildable lots in "exceptions areas" (i.e., areas committed by development to non-resource use). Deschutes County was also acknowledged with a provision that effectively made every lot zoned for resource use a buildable lot for residential purposes. Thus the EFU 20 zone was effectively a rural residential zone with a 20-acre minimum lot size. This provision was removed in 1987, when the County began reporting development activity in resource zones as required by State law.

Urban level development is also allowed in destination resorts (e.g., Sun River, Black Butte or Eagle Crest) which have basic urban level services and have seen significant development activity during the last decade.

Inside the UGB, the City's and County's policy is to determine maximum residential densities in the General Plan, and implement them through City and County Zoning. (Bend General Plan, Residential Policies 1, 2 and 3). In areas where water service is not available, the minimum lot size is five acres (Policy 6). Water service is provided in unincorporated areas by one of several water districts. The City's and County's policy is to development common improvement standards so that these facilities can be integrated into a common system within the UGB.

Outside the City Limits but inside the UGB, the County RL (Residential Low Density) zone allows development on 20,000 square foot lots, or greater. Urban development is also allowed on a minimum of 6,000 square foot lots in the RS zone when "community"³ sewer service is provided. When sanitary sewer service is not available, the minimum lot size is 14,000 square feet, provided that a redevelopment plan is approved. According to the County Planning Director, this redevelopment provision has not been applied in unincorporated areas on a consistent basis.

³Outside the City Limits, community sewer and water can be provided by the Juniper Utility Company, which services the needs of developments built by the J.L. Ward Company, a private land development firm. This arrangement was permitted by the County during a period when zoning and building codes were repealed by initiative petition in the late 1960s. Sanitary sewer and domestic water service are also provided by special districts in some portions of the UGB.

Inside the City, the predominant zone is RS (Residential with a 6,000 square foot minimum lot size). The City also has multiple family residential zones that allow development densities of 43 units per acre (RH) and 20 units per acre (RM).

Residential Policy 12 requires that special consideration be given to hillside development, to minimize storm run-off, transportation impacts, cuts and fills and visual impacts. Accordingly, density limitations have been placed on the Awbrey Butte area, which restrict overall density to 1.86 units per gross acre. Residential Policies 29 and 33 allow recreational uses (golf courses, riding stables) to be included within overall density calculations (*i.e.*, cluster developments are encouraged where open space amenities are provided).

The City of Bend requires annexation as a condition of urban development on City sewer and water services. In the early 1980s, Phase 1 of the City's sewerage treatment and collection system was completed for developed areas of the City. Phase 2 of the system is designed to serve areas inside the UGB that are not served by the Juniper Utility District.

It is the City and County's policy to coordinate the provision of sewer and water service with existing special districts, and to prohibit the creation of new districts within the Bend UGB. It is anticipated that existing sewer districts, which are located in the Phase 2 area and which operate on community drain fields, may contract with the City for connection to the City system.

3.0 LAND DEVELOPMENT DATA

3.1 SOURCE *Deschutes County Assessment Data 1985-89*, Deschutes County Assessor's Department.

Description The Deschutes County assessment records provide information on the amount and configuration of development in the Bend case study area. Deschutes County provided all records in the study area for which the field "year built" was between 1985-89 inclusive. A property is assessed and recorded in the assessment records in the year it is constructed, thus the year-built designation. For mobile homes, the year built field indicates "year manufactured." The data do not account at all for mobile homes in mobile home parks. We used the following information from this data base in our analysis of development in the Bend case study area and analysis areas (Tables A-3a and A-3b): location information (map I.D. and tax lot number), size of lot or parcel, square feet of improvements, zoning, and number of dwelling units for residential properties.

Table A-3a and A-3b show the amount and percent of development by type and analysis area.

Evaluation The Deschutes County assessment records are the most complete and consistent source of information available to us on the amount and configuration of development in the Bend case study area. However, many records in the data base are not complete. Because about 75 percent of the records did not include acreages, we are unable to estimate development density with this database. Zoning information is not entirely reliable; county officials estimate that zoning information is 90% accurate.

METHODS The first step in evaluating the amount and configuration of development using the Deschutes County assessment records was to define the analysis areas. We defined analysis areas by Bend transportation zone on the basis of improved value per acre. The Deschutes County Assessment records provide the number of dwellings on each tax lot. We aggregated this data by transportation zone to classify each transportation zone as urban or urbanizable. We then refined this analysis by urban or exception areas, resource zones, and other zones based on the assessor's zones provided in the database. We identified destination resort areas by township, range and section. We identified rural service areas by their zoning district.

Table A-3a shows the amount of development by type and analysis area. We summed dwelling units (DU) by analysis area and zone to determine the amount of development by type for single and multiple-family dwellings. To determine the amount of commercial and industrial development, we aggregated data in commercial and industrial zones by analysis area. To determine the amount of development on resource lands, we aggregated the data for EFU, F, FU, and FU-20 zones.

ANALYSIS We used year-built data as one indicator of the amount and configuration of development that occurred in the Bend case study area from 1985 through 1989. Our analysis also considered approved subdivisions, partitions, and building permits as measures of development.

Tables A-3a and A-3b provide an overview of the amount of development by type and analysis area that occurred in the Bend case study area from 1985 through 1989. A total of 4,300 single-family dwelling units were constructed or placed in the study area from 1985-89. About 88 percent (3,790 dwelling units) of this development occurred inside the Bend UGB or in Deschutes County exception areas. The remaining 12 percent (510 dwelling units) occurred

in resource zones. This figure indicates a substantial amount of development (510 dwelling units constructed between 1985 and 1989) occurred on resource lands.

Our analysis shows that a total of 2,513 dwelling units were constructed in exurban areas between 1985 and 1989. Of these, 1,822 were constructed in exceptions areas. In exceptions areas, 349 dwelling units were constructed in destination resort areas (Sun River, Black Butte or Eagle Crest) and 25 in rural service communities such as Tollgate.

Overall, our analysis of county assessment records shows that about half of the 4,728 single and multiple family dwelling units constructed or placed between 1985 and 1989 occurred inside the Bend UGB. About 34 percent of single family residences (1,445 dwelling units) constructed between 1985 and 1989 were built inside the Bend UGB. The largest portion (about 61 percent of all single-family DUs in the Bend case study area) occurred in areas we identified as Exurban. About 37 percent of single-family residences built in Exurban areas occurred on resource lands. These figures show that a relatively large amount of development occurred outside of the Bend UGB, and that development is occurring on resource lands.

A total of 153 dwelling units were built in the cities of Sisters and Redmond between 1985 and 1989 accounting for about 3.5 percent of all single family residences. Of the 428 multiple family residences, 48 (11 percent) were constructed in Sisters and Redmond.

About 88 percent of the multiple family dwelling units constructed between 1985 and 1989 occurred inside the Bend UGB. About 50 percent of multiple family dwelling units were constructed in urbanizable areas.

A total of 203 commercial and industrial developments occurred in the study area, with about 80 percent of these developments occurring inside the Bend UGB.

TABLE A-3a
AMOUNT OF DEVELOPMENT BY TYPE
1985-89

Building Type	Bend Urban Area ^a	Bend Urbanizable Area ^b	Cities of Sisters and Redmond	Bend Urban Fringe ^c	Exurban ^d	Total
Single-Family						
Dwelling Units						
Residential/Exception Zones	310	1,066	153	123	1,822	3,474
Rural Residential Zones	NA	NA	NA	123	1,448	1,571
Destination Resorts	NA	NA	NA	0	349	349
Rural Service Communities	NA	NA	NA	0	25	25
Resource Zones	0	6	NA	65	439	510
Other Zones	0	40	NA	2	252	294
Total	310	1,135	153	189	2,513	4,300
Multiple Family						
Dwelling Units	164	213	48	3	0	428
Commercial/Industrial						
Number of developments	80	85	N/A	0	38	203

Source: Deschutes County Assessment Records, 1985-89.

NA - Not Applicable

- ^a Bend urban area is defined as transportation zones inside the Bend UGB with greater than \$40,000 of improvement value per acre
- ^b Bend urbanizable area is defined as transportation zones inside the Bend UGB with less than \$40,000 of improvement value per acre
- ^c Bend urban fringe is defined as all Bend transportation zones outside of the Bend UGB
- ^d Exurban is defined as tax lots outside all UGBs and the Bend Urban Fringe with Deschutes County zoning

TABLE A-3b

AMOUNT OF DEVELOPMENT BY TYPE
Percent by Analysis Area, 1985-89

Building Type	Bend Urban Area ^a	Bend Urbanizable Area ^b	City Limits of Redmond and Sisters	Total UGB	Bend Urban Fringe ^c	Exurban ^d	Total Rural
Single-Family							
Dwelling Units							
Residential Zones	8.9%	30.7%	4.4%	44.0%	3.5%	52.4%	58.6%
Resource Zones	0.0%	1.2%	NA	1.2%	12.7%	86.1%	98.8%
Other Zones	0.0%	13.6%	NA	13.6%	0.7%	85.7%	86.4%
Average	7.2%	26.4%	3.6%	37.2%	4.4%	58.4%	65.2%
Multiple Family							
Dwelling Units	38.3%	49.8%	11.2	99.3%	0.7%	0.0%	0.8%
Commercial/Industrial							
Number of developments	39.4%	41.9%		81.3%	0.0%	18.7%	18.7%

Source: Deschutes County Assessment Records, 1985-89.

- ^a Bend urban area is defined as transportation zones inside the Bend UGB with greater than \$40,000 of improvement value per acre
- ^b Bend urbanizable area is defined as transportation zones inside the Bend UGB with less than \$40,000 of improvement value per acre
- ^c Bend urban fringe is defined as all Bend transportation zones outside of the Bend UGB
- ^d Exurban is defined as tax lots outside all UGBs and the Bend Urban Fringe with Deschutes County zoning

3.2 SOURCE

Deschutes County Building Permit Data 1985-89, Deschutes County Public Works Department.

Description The Deschutes County building permit data provide information on the amount and configuration of development in the Bend case study area. Deschutes County provided all records in the study area for building permits which were issued between 1985 and 1989. This data base does not include permits issued in Deschutes County outside of Bend transportation zones. We used the following information from this data base in our analysis of development in the Bend case study area and analysis areas (Tables A-4a and A-4b): location information (map I.D. and tax lot number) and building code (indicates type of building and use).

Table A-4a and A-4b show the amount and percent of building permits issued by type and analysis area between 1985 and 1989.

Evaluation The Deschutes County building permit data are the only computerized source of information available to us on the number and configuration of building permits issued in the Bend case study area. Our database does not include any permits issued outside of Bend transportation zones. Comparison of building permits with year-built data from the Deschutes County Assessment records shows a low correlation in all analysis zones. Thus, the accuracy of this database may be limited. Not all records in the data base are complete. Because the database did not include acreages, we were unable to estimate development density with this database.

METHODS

To analyze the building permit database, first we classified the records by analysis area. We then flagged records by building type (e.g. single-family) using the building code field. Finally, the number of permits issued were counted by analysis area and building type.

ANALYSIS

We used building permit data as one indicator of the amount and configuration of development that occurred in the Bend case study area from 1985 through 1989. Our analysis also considered approved subdivisions and partitions and Deschutes County assessment records as measures of development.

Tables A-4 provides an overview of the amount of development by type and analysis that occurred in the Bend case study area from 1985 through 1989. A total of 423 single-family building permits were issued in the study area from 1985-89. About 93 percent of this development occurred inside the Bend UGB (this does not include permits issued outside of Bend transportation zones). The remaining 7 percent occurred in the Bend urban fringe.

A total of 297 building permits were issued for commercial and industrial buildings between 1985 and 1989. About 95 percent of the commercial and industrial permits were issued inside the Bend UGB. Of these, 78 percent (233 permits) were issued in urbanizable areas.

Overall, our analysis of county assessment records shows that the majority of building permits issued were inside the Bend UGB. We were unable to refine our analysis by resource and non-resource lands because the database did not include zoning.

TABLE A-4
BUILDING PERMITS ISSUED BY TYPE
1985-89

Building Type	Bend Urban Area ^a	Bend Urbanizable Area ^b	Bend Urban Fringe ^c	Exurban ^d	Total
Single-Family					
Permits Issued					
Residential/Exceptions Zones	117	279	27	NA	423
Residential Zones	-	-	NA	NA	
Destination Resorts	-	-	NA	NA	
Rural Service Communities	-	-	NA	NA	
Total	117	279	27	NA	423
Multiple Family					
Commercial/Industrial					
Permits Issued	51	233	13	NA	297

Source: Deschutes County Assessment Records, 1985-89.

NA - Not Available

- ^a Bend urban area is defined as transportation zones inside the Bend UGB with greater than \$40,000 of improvement value per acre
- ^b Bend urbanizable area is defined as transportation zones inside the Bend UGB with less than \$40,000 of improvement value per acre
- ^c Bend urban fringe is defined as all Bend transportation zones outside of the Bend UGB
- ^d Exurban is defined as tax lots outside all UGBs and the Bend Urban Fringe with Deschutes County zoning

3.3 SOURCE

Deschutes County and City of Bend Subdivision Records 1985-89, Deschutes County and City of Bend Planning Departments.

Description This data source includes all approved subdivisions in Bend from 1982-90 and Deschutes County (outside of the Sisters and Redmond UGBs) from 1985-89. Subdivisions include all land divisions of 4 or more lots. This data base was used to analyze the amount, configuration, and density of approved subdivisions in the Bend case study area (Tables A-5a through A-8). This analysis is presented by analysis area (defined on the tax map level). To analyze approved subdivisions we reviewed zoning, number of lots, acreage, and density (lots/acre).

Table A-5a shows the total number of lots and the average lot size created by analysis area for the period 1985-89. Table A-5b shows the percentage of subdivision lots created by analysis area. Table A-6a shows the distribution of new subdivision lots by density class for each analysis area. Table A-6b shows the percentage of subdivision lots created by density class. Table A-7a shows actual versus allowable density for the number of subdivision lots created as a percent of allowable density by zone and analysis area. Table A-7b shows the percentage of lots as a percent of allowable density by analysis area and zone. Table A-8 presents a comparison of actual versus allowable lot size by zone and analysis area.

Evaluation This data base is the best source of approved subdivisions in the Bend case study area. However, not all records in the data base are complete. Some records did not have information on zoning, lots, or acreage. We did not include these records in the density calculations so as not to bias our analysis. We did not have density data for the estimated 40 subdivision lots in Sunriver.

METHODS

Table A-5a shows the total number of lots and the average lot size created by analysis area for the period 1985-89. To develop these figures, we totaled the number of subdivision lots created by analysis area during the period 1985-89. We then divided the total subdivision acreage for each analysis area by the total subdivision lots created to obtain our estimate of average lot size.

Table A-6a shows the distribution of new subdivision lots by density class for each analysis area. To develop the figures presented in Table A-6a, we calculated the overall density of each subdivision and then summed the number of lots created by density class and analysis area.

Table A-7a shows actual versus allowable density for the number of subdivision lots created as a percent of allowable density by zone and analysis area. To develop our estimates of actual v. allowable densities for residential subdivisions, we aggregated the number of lots created by zone and analysis area. We then compared actual density (as a percent of allowable density) with the maximum allowable density for each zone designation as specified in the Bend and Deschutes County zoning codes.

Table A-8 presents a comparison of actual versus allowable lot size by zone and analysis area. The data presented in Table A-8 summarize the raw data presented in Table A-7a. The minimum lot sizes were converted into a maximum net density (in DU/acre) and compared with the average actual lot size from the subdivision data. To derive our net density estimates, we assumed the 25 percent of the land area in subdivisions with minimum lot sizes of less than 1 acre is deeded to streets, public lands, etc. We then present the average percent of

allowable density by zone. The total number of lots which had the corresponding acreage figures are also presented.

ANALYSIS We analyzed approved subdivisions in the Bend case study area as an alternative measure of the amount and configuration of residential development. Our analysis does not include subdivisions within the Redmond or Sisters UGBs.

Our analysis shows that 1,775 subdivision lots were approved in the Bend case study area between 1985 and 1989. About 64 percent of approved subdivision lots occurred inside the Bend UGB.

There were a total of 1,449 approved residential subdivision lots. About 47 percent occurred in urban areas. Lots approved in urban areas had an average size of 0.69 acres. About 40 percent (734 lots) of approved subdivision lots between 1985 and 1989 occurred in urbanizable areas. The average size of lots approved in urbanizable areas was 0.38 acres, the smallest of any analysis area.

Seventy-five subdivision lots were approved in the Bend urban fringe area between 1985 and 1989. The average subdivision lot size in the Bend urban fringe was 4.75 acres.

A total of 184 subdivision lots were approved in Exurban areas between 1985 and 1989. Of the 184 lots created in Exurban areas, 33 were approved in resource zones. The creation of subdivision lots or resource lands was rare to non-existent in other case study areas. The average lot size of subdivision lots created in resource zones was 22.78 acres. The average lot size in Exurban exception areas was 6.32 acres.

Tables A-6a and A-6b show the number of subdivision lots created by density class. Note that densities are in lots per net acre. In the Bend urban area, 76.7 percent of approved subdivision lots fell between 2 and 8 lots per acre. Nearly 94 percent of lots approved in the urbanizable area were between 2 and 8 lots per acre.

Tables A-7a and A-7b summarize the extent to which approved subdivisions are reaching allowable densities. Of the 1,449 residential subdivision lots created in the Bend UGB only 11.7 percent attain densities of 90 percent or more of allowable density. This figure shows that subdivisions approved in the Bend UGB are occurring at densities far lower than those allowed by the Bend and Deschutes County Zoning Codes. This is, in part, explainable by the fact that Bend has limited density in the steeply sloped Awbrey Butte area, where a large number of subdivision lots have been developed.

Table A-8 compares actual versus allowable density in lots created per net acre. For city zones, actual densities are generally less than the allowable density. Subdivisions are generally occurring at densities greater than allowable in areas outside the Bend UGB (mainly on zones with minimum lot sizes of more than 5 acres). This anomaly may be explained by the fact that the MUA 10 zone allows lot sizes of 5 acres in proximity to the UGB.

TABLE A-5a

APPROVED SUBDIVISIONS
1985-89¹

Subdivisions	Bend Urban Area ^a	Bend Urbanizable Area ^b	Bend Urban Fringe ^c	Exurban ^{d,e}
Number of lots				
Urban/Exception Areas	682	541	75	151
Residential/Exception Areas	-	-	NA	NA
Destination Resorts	-	-	NA	NA
Rural Service Communities	-	-	NA	NA
Multiple Family Zones	80	153	0	0
Resource Zones	0	0	0	33
Other Zones	0	20	0	0
Total	762	714	75	184
Average lot size (acres)				
Urban/Exception Areas	0.70	0.40	4.75	6.32
Multiple Family Zones	0.15	0.21	-	-
Resource Zones	-	-	-	22.78
Other Zones	-	0.21	-	-
Average	0.69	0.38	4.75	9.27

Source: City of Bend Planning Department, Deschutes County Planning Department.

NA - Not Available

¹ Urban and urbanizable areas include subdivisions approved from 1982-90.

^a Bend urban area is defined as transportation zones inside the Bend UGB with greater than \$40,000 of improvement value per acre

^b Bend urbanizable area is defined as transportation zones inside the Bend UGB with less than \$40,000 of improvement value per acre

^c Bend urban fringe is defined as all Bend transportation zones outside of the Bend UGB

^d Exurban is defined as tax lots outside all UGBs and the Bend Urban Fringe with Deschutes County zoning

^e Does not include 40 subdivision lots in Sunriver.

TABLE A-5b

PERCENT OF APPROVED SUBDIVISION LOTS BY ANALYSIS AREA
1985-89¹

Subdivisions	Bend Urban Area ^a	Bend Urbanizable Area ^b	Bend Urban Fringe ^c	Exurban ^{de}
Number of lots				
Urban/Exception Areas	46.4%	38.2%	5.1%	10.2%
Multiple Family Zones	34.3%	65.7%	0.0%	0.0%
Resource Zones	0.0%	0.0%	0.0%	100.0%
Other Zones	0.0%	100.0%	0.0%	0.0%
Total	43.4%	41.8%	4.2%	10.4%

Source: City of Bend Planning Department, Deschutes County Planning Department.

¹ Urban and urbanizable areas include subdivisions approved from 1982-90.

^a Bend urban area is defined as transportation zones inside the Bend UGB with greater than \$40,000 of improvement value per acre

^b Bend urbanizable area is defined as transportation zones inside the Bend UGB with less than \$40,000 of improvement value per acre

^c Bend urban fringe is defined as all Bend transportation zones outside of the Bend UGB

^d Exurban is defined as tax lots outside all UGBs and the Bend Urban Fringe with Deschutes County zoning

^e Does not include 40 subdivision lots in Sunriver.

TABLE A-6a

DISTRIBUTION OF RESIDENTIAL SUBDIVISION LOTS
 Number of Lots by Density Class
 1985-89¹

Density (Lots/Net Acre ²)	Bend Urban Area ^a	Bend Urbanizable Area ^b	Bend Urban Fringe ^c	Exurban ^{de}
0 - .2	47	4	67	148
.2 - .5	71	0	8	3
.5 - 1	64	47	0	0
1 - 2	356	21	0	0
2 - 4	86	268	0	0
4 - 6	45	306	0	0
6 - 8	93	68	0	0
8 - 10	0	0	0	0
> 10	0	0	0	0
Total	762	714	75	151

Source: City of Bend Planning Department, Deschutes County Planning Department.

¹ Urban and urbanizable areas include subdivisions approved from 1982-90.

^a Bend urban area is defined as transportation zones inside the Bend UGB with greater than \$40,000 of improvement value per acre

^b Bend urbanizable area is defined as transportation zones inside the Bend UGB with less than \$40,000 of improvement value per acre

^c Bend urban fringe is defined as all Bend transportation zones outside of the Bend UGB

^d Exurban is defined as tax lots outside all UGBs and the Bend Urban Fringe with Deschutes County zoning

^e Does not include 40 subdivision lots in Sunriver.

² Lots/Net Acre assumes 25% of gross acreage is deeded for streets, etc.

TABLE A-6b

DISTRIBUTION OF RESIDENTIAL SUBDIVISION LOTS
 Percent of Lots by Density Class
 1985-89¹

Density (Lots/Net Acre ²)	Bend Urban Area ^a	Bend Urbanizable Area ^b	Bend Urban Fringe ^c	Exurban ^{d,e}
0 - .2	6.2%	0.5%	89.3%	98.0%
.2 - .5	9.3%	0.0%	10.7%	2.0%
.5 - 1	8.4%	6.6%	0.0%	0.0%
1 - 2	46.7%	2.9%	0.0%	0.0%
2 - 4	11.3%	37.5%	0.0%	0.0%
4 - 6	5.9%	42.8%	0.0%	0.0%
6 - 8	12.2%	9.5%	0.0%	0.0%
8 - 10	0.0%	0.0%	0.0%	0.0%
> 10	0.0%	0.0%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%

Source: City of Bend Planning Department, Deschutes County Planning Department.

¹ Urban and urbanizable areas include subdivisions approved from 1982-90.

^a Bend urban area is defined as transportation zones inside the Bend UGB with greater than \$40,000 of improvement value per acre

^b Bend urbanizable area is defined as transportation zones inside the Bend UGB with less than \$40,000 of improvement value per acre

^c Bend urban fringe is defined as all Bend transportation zones outside of the Bend UGB

^d Exurban is defined as tax lots outside all UGBs and the Bend Urban Fringe with Deschutes County zoning

^e Does not include 40 subdivision lots in Sunriver.

² Lots/Net Acre assumes 25% of gross acreage is deeded for streets, etc.

TABLE A-7a

RESIDENTIAL DEVELOPMENT: ACTUAL VS. ALLOWABLE DENSITY
 Number of Subdivision Lots Created as Percent of Allowable Density
 1985-89¹

Analysis Area/ Zone	Number of Lots Created by Density Class						Total
	Percent of Allowable Density						
	1-25%	25-50%	50-70%	70-80%	80-90%	90-100+ %	
Bend Urban Area^a							
City of Bend							
RS	523	15	73	60	0	19	675
RS (Awbrey Butte)							
RM	0	74	0	0	0	0	74
Deschutes County							
RL	0	0	0	0	0	13	13
Subtotal	523	89	73	60	0	32	762
Bend Urbanizable Area^b							
City of Bend							
RS	64	0	65	279	0	0	408
RM	21	74	0	0	0	0	95
RH	58	0	0	0	0	0	58
Deschutes County							
RL	0	0	4	0	0	141	145
MUA-10	0	0	0	0	0	4	4
Subtotal	143	74	69	279	0	145	714
Total Bend UGB	666	163	142	339	0	177	1,476

Source: City of Bend Planning Department, Deschutes County Planning Department.

¹ Urban and urbanizable areas include subdivisions approved from 1982-90.

a Bend urban area is defined as transportation zones inside the Bend UGB with greater than \$40,000 of improvement value per acre

b Bend urbanizable area is defined as transportation zones inside the Bend UGB with less than \$40,000 of improvement value per acre

TABLE A-7b

RESIDENTIAL DEVELOPMENT: ACTUAL VS. ALLOWABLE DENSITY
Percent of Subdivision Lots Created as Percent of Allowable Density
1985-89¹

Analysis Area/ Zone	Percent of Lots Created by Density Class						Total
	Percent of Allowable Density						
	1-25%	25-50%	50-70%	70-80%	80-90%	90-100+ %	
Bend Urban Area^a							
City of Bend							
RS	77.5%	2.2%	10.8%	8.9%	0.0%	2.8%	100.0%
RS (Awbrey Butte)							
Deschutes County							
RL	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Subtotal	68.6%	11.7%	9.6%	7.9%	0.0%	4.2%	100.0%
Bend Urbanizable Area^b							
City of Bend							
RS	15.7%	0.0%	15.9%	68.4%	0.0%	0.0%	100.0%
Deschutes County							
RL	0.0%	0.0%	2.8%	0.0%	0.0%	97.2%	100.0%
MUA-10	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Subtotal	20.0%	10.4%	9.9%	39.1%	0.0%	20.3%	100.0%
Total Bend UGB	45.1%	11.0%	9.6%	23.0%	0.0%	12.0%	100.0%

Source: City of Bend Planning Department, Deschutes County Planning Department.

¹ Urban and urbanizable areas include subdivisions approved from 1982-90.

a Bend urban area is defined as transportation zones inside the Bend UGB with greater than \$40,000 of improvement value per acre

b Bend urbanizable area is defined as transportation zones inside the Bend UGB with less than \$40,000 of improvement value per acre

TABLE A-8

SINGLE-FAMILY RESIDENTIAL ACTUAL VS. ALLOWABLE DENSITY
 Comparison of Actual and Allowable Lot Size
 1985-89¹

Analysis Area/ Zone	Maximum Allowable Density		Actual Average Density (lots/net acre)	Average Percent of Allowable Density	Number of Subdivision Lots Created
	Min. Lots Size	Lots, Units/ Net Acre ²			
Bend Urban Area^a					
City of Bend					
RS	6,000 sq ft	7.3	1.35	18.5%	585
RS (Awbrey Butte)	27,000 sq ft	1.6	0.96	60.0%	90
RM	2,000 sq ft	20	4.93	24.7%	80
Deschutes County					
RL	20,000 sq ft	2	2.11	105.5%	13
Bend Urbanizable Area^b					
City of Bend					
RS	6,000 sq ft	7.3	1.86	25.6%	408
RM	2,000 sq ft	20	4.34	21.7%	95
RH	1,000 sq ft	40	2.81	7.0%	58
Deschutes County					
RL	20,000 sq ft	2	1.64	82.0%	145
MUA-10	10 ac	0.1	0.12	120.0%	4
Bend Urban Fringe^c					
Deschutes County					
RR-10	10 ac	0.1	0.21	210.0%	75
Exurban^d					
Deschutes County					
RR-10	10 ac	0.1	0.16	160.0%	140
RSR-5	5 ac	0.2	0.18	90.0%	7
MUA-10	10 ac	0.1	0.11	110.0%	4
EFU-20	20 ac	0.05	0.04	80.0%	33

Source: City of Bend Planning Department, Deschutes County Planning Department.

¹ Urban and urbanizable areas include subdivisions approved from 1982-90.

^a Bend urban area is defined as transportation zones inside the Bend UGB with greater than \$40,000 of improvement value per acre

^b Bend urbanizable area is defined as transportation zones inside the Bend UGB with less than \$40,000 of improvement value per acre

^c Bend urban fringe is defined as all Bend transportation zones outside of the Bend UGB

^d Exurban is defined as tax lots outside all UGBs and the Bend Urban Fringe with Deschutes County zoning

² Net acres - assume 43,560 buildable square feet per acre. We assumed a maximum allowable density in DU/acre for RM and RH zones. however, we recognize that subdivision lots of this size could not be created under City zoning.

3.4 SOURCE

Deschutes County and City of Bend Partition Records 1985-89, Deschutes County and City of Bend Planning Departments.

Description The Deschutes County and City of Bend partition data provide information on all approved partitions in the Bend case study area during the period 1985-89. Partitions include all land divisions under three parcels. We analyzed partition data by analysis area using Deschutes County tax maps. Our analysis of the amount, configuration, and density of approved partitions in residential areas is based on zoning, number of parcels, and acreage of new parcels. Tables A-9 through A-12 present the results of this analysis.

Table A-9a shows the number of residential partitions and the average parcel size by analysis area for the period 1985-89. Table A-9b shows the percent of parcels created by analysis area. Table A-10a shows the distribution of new parcels for single and multi-family zoning by analysis area. Table A-10b shows percent of parcels created by density class. Table A-11a shows actual versus allowable density for new parcels created as a percent of allowable density by analysis area and zone. Table A-11b shows percentage of parcels created as a percent of allowable density by analysis area and zone. Table A-12 shows actual versus allowable parcel size by analysis area and zone.

Evaluation The Deschutes County and City of Bend partition data are the best available source for approved partitions in the Bend case study area. Because the data base does not include partitions which occurred outside of Bend transportation zones, we were unable to perform a density or zone analysis for the Exurban areas. However, we were provided with the total number of partitions which occurred in Exurban areas.

METHODS

Table A-9 shows the number of residential partitions and the average parcel size by analysis area for the period 1985-89. We derived the figures presented in Table A-9 by summing the number of parcels by analysis area. We summed the total acreage of partitioned parcels and divided it by the number of parcels for each analysis area to obtain our estimate of average parcel size.

Table A-10 shows the distribution of new parcels for single and multi-family zoning by analysis area. To develop the figures presented in Table A-10, we summed the number of parcels in each density class by analysis area.

Table A-11 shows actual versus allowable density for new parcels created as a percent of allowable density by analysis area and zone. To develop our estimates of actual v. allowable densities for residential partitions, we aggregated the number of parcels created by zone and analysis area. We then compared actual density (as a percent of allowable density) with the maximum allowable density for each zone designation as specified in the Bend and Deschutes County zoning codes.

Table A-12 shows actual versus allowable parcel size by analysis area and zone. The data presented in Table A-12 summarize the raw data presented in Table A-11. The maximum allowable densities (in DU/acre) were converted into a minimum lot size (the reciprocal of DU/acre) and compared with the average actual parcel size from the partition data. We then present the average percent of allowable density by zone. The total number of lots which had the corresponding acreage figures are also presented.

ANALYSIS Our analysis of partitions in the Bend case study area indicate that during the period 1985 through 1989, a total of 421 parcels were created through land partitions.

In the Bend urban area, 25 parcels were created in commercial and industrial zones; there were no residential parcels created. Our analysis of the Bend urbanizable area shows 114 parcels were created, accounting for 36 percent of the study area total. The average parcel size 10.85 acres in residential zones.

Our analysis shows 60 parcels were created in the Bend urban fringe area. The 28 parcels created in the urban fringe averaged 4.18 acres in residential zones. A total of 222 parcels were created in the Exurban area between 1985 and 1989. We believe most of these were residential partitions based on zoning for this area.

Tables A-10a and A-10b show the distribution of new residential parcel size by density class. Table A-11 shows actual versus allowable density for new residential parcels for city zones in the study area. Over 80 percent of partitions in City zones occurred at less than 90 percent of allowable residential density.

TABLE A-9a
APPROVED PARTITIONS
1985-89

Partitions	Bend Urban Area ^a	Bend Urbanizable Area ^b	Bend Urban Fringe ^c	Exurban ^{d,e}
Number of parcels				
Residential/Exception Zones	0	41	28	NA
Exception Areas	-	-	NA	NA
Destination Resorts	-	-	NA	NA
Rural Service Communities	-	-	NA	NA
Resource Zones	0	11	9	NA
Com/Ind Zones	25	38	23	NA
Other Zones (UAR)	0	24	0	NA
Total	25	114	60	222
Average parcel size (ac)				
Residential Zones	-	10.85	4.18	NA
Resource Zones	-	19.11	56.14	NA
Com/Ind Zones	2.13	3.82	0.48	NA
Other Zones (UAR)	-	32.49	-	NA
Average	2.13	18.88	16.83	NA

Source: City of Bend Planning Department, Deschutes County Planning Department.

NA - Not Available

- ^a Bend urban area is defined as transportation zones inside the Bend UGB with greater than \$40,000 of improvement value per acre
- ^b Bend urbanizable area is defined as transportation zones inside the Bend UGB with less than \$40,000 of improvement value per acre
- ^c Bend urban fringe is defined as all Bend transportation zones outside of the Bend UGB
- ^d Exurban is defined as tax lots outside all UGBs and the Bend Urban Fringe with Deschutes County zoning
- ^e A total of 112 new parcels were created in Exurban areas, however, no zoning or lot size information was gathered. for partitions in this analysis area

TABLE A-9b

APPROVED PARTITIONS
Percent of Approved Partitions by Analysis Area
1985-89

Partitions	Bend Urban Area ^a	Bend Urbanizable Area ^b	Bend Urban Fringe ^c	Rest of County ^d
Percent of Parcels	5.9%	27.1%	14.3%	52.7%

Source: City of Bend Planning Department, Deschutes County Planning Department.

- ^a Bend urban area is defined as transportation zones inside the Bend UGB with greater than \$40,000 of improvement value per acre
- ^b Bend urbanizable area is defined as transportation zones inside the Bend UGB with less than \$40,000 of improvement value per acre
- ^c Bend urban fringe is defined as all Bend transportation zones outside of the Bend UGB
- ^d Exurban is defined as tax lots outside all UGBs and the Bend Urban Fringe with Deschutes County zoning

TABLE A-10a

DISTRIBUTION OF NEW PARCELS BY SIZE
Number of Parcels by Density Class
1985-89

Density (Parcels/ Gross Acre)	Bend Urban Area ^a	Bend Urbanizable Area ^b	Exception Areas	Bend Urban Fringe ^c	Resource Areas	Exception Areas	Rest of County ^d	Resource Areas
0 - .2	0	18		6	9		NA	NA
.2 - .5	0	6		9	0		NA	NA
.5 - 1	0	8		0	0		NA	NA
1 - 2	0	7		4	0		NA	NA
2 - 4	0	0		2	0		NA	NA
4 - 6	0	2		4	0		NA	NA
6 - 8	0	0		3	0		NA	NA
8 - 10	0	0		0	0		NA	NA
> 10	0	0		0	0		NA	NA
Total	0	41		28	9		NA	NA

Source: City of Bend Planning Department, Deschutes County Planning Department.

NA - Not Available

- ^a Bend urban area is defined as transportation zones inside the Bend UGB with greater than \$40,000 of improvement value per acre
- ^b Bend urbanizable area is defined as transportation zones inside the Bend UGB with less than \$40,000 of improvement value per acre
- ^c Bend urban fringe is defined as all Bend transportation zones outside of the Bend UGB
- ^d Exurban is defined as tax lots outside all UGBs and the Bend Urban Fringe with Deschutes County zoning

TABLE A-10b

DISTRIBUTION OF NEW PARCELS BY SIZE
Number of Parcels by Density Class
1985-89

Density (Parcels/ Gross Acre)	Bend Urban Area ^a	Bend Urbanizable Area ^b	Bend Urban Fringe ^c		Rest of County ^d	
			Exception Areas	Resource Areas	Exception Areas	Resource Areas
0 - .2	-	43.9%	21.4%	100.0%	NA	NA
.2 - .5	-	14.6%	32.1%	0.0%	NA	NA
.5 - 1	-	19.5%	0.0%	0.0%	NA	NA
1 - 2	-	17.0%	14.3%	0.0%	NA	NA
2 - 4	-	12.0%	7.1%	0.0%	NA	NA
4 - 6	-	0.0%	14.3%	0.0%	NA	NA
6 - 8	-	4.9%	10.7%	0.0%	NA	NA
8 - 10	-	0.0%	0.0%	0.0%	NA	NA
> 10	-	0.0%	0.0%	0.0%	NA	NA
Total	-	100.0%	100.0%	100.0%	NA	NA

Source: City of Bend Planning Department, Deschutes County Planning Department.

NA - Not Available

- ^a Bend urban area is defined as transportation zones inside the Bend UGB with greater than \$40,000 of improvement value per acre
- ^b Bend urbanizable area is defined as transportation zones inside the Bend UGB with less than \$40,000 of improvement value per acre
- ^c Bend urban fringe is defined as all Bend transportation zones outside of the Bend UGB
- ^d Exurban is defined as tax lots outside all UGBs and the Bend Urban Fringe with Deschutes County zoning

TABLE A-11

RESIDENTIAL DEVELOPMENT: ACTUAL VS. ALLOWABLE DENSITY
Percent of New Parcels by Density Class
1985-89

Analysis Area/ Zone	Percent of Parcels Created by Density Class						Total
	Percent of Allowable Density						
	1-25%	25-50%	50-70%	70-80%	80-90%	90-100+ %	
Bend Urban Area^a							
City of Bend - No partitions occurred in Bend urban areas							
Bend Urbanizable Area^b							
City of Bend							
RS	86.7%	0.0%	0.0%	0.0%	0.0%	13.3%	100.0%
UAR-10	20.8%	8.3%	37.5%	0.0%	12.5%	20.8%	100.0%
Deschutes County							
RL	84.6%	15.4%	0.0%	0.0%	0.0%	0.0%	100.0%
SR-2.5	50.0%	0.0%	0.0%	0.0%	0.0%	50.0%	100.0%
Subtotal	55.3%	7.1%	16.1%	0.0%	5.4%	16.1%	100.0%
Total Bend UGB	55.3%	7.1%	16.1%	0.0%	5.4%	16.1%	100.0%

Source: City of Bend Planning Department, Deschutes County Planning Department.

- ^a Bend urban area is defined as transportation zones inside the Bend UGB with greater than \$40,000 of improvement value per acre
- ^b Bend urbanizable area is defined as transportation zones inside the Bend UGB with less than \$40,000 of improvement value per acre

4.0 URBAN LIVABILITY ISSUES

4.1 SOURCE *Oregon Rent and Vacancy Survey, 1986-88*, U.S. Department of Housing and Urban Development; *Home Selling Price Listings*, Oregon Multiple Listings Service, Bend, Medford, Portland, and Brookings.

Description The U.S. Department of Housing and Urban Development (HUD) conducts an annual rent and vacancy survey of multifamily apartments in selected cities throughout Oregon. The survey includes a random selection of conventionally-built apartments from one to eleven years old and from one to three stories in height. Table A-13 shows average rents between 1986 and 1988 for Bend area, the Portland Metro area, Medford, and the state as a whole.

Oregon Multiple Listings Service (OMLS) is an organization that compiles information about the housing market for specific areas across the state. OMLS collects its housing sales information from realtors who sell houses. Once a participating realtor sells a home, they provide information including (1) sales price, (2) number of days on the market, and (3) type of house sold to the OMLS. OMLS uses this information to issue monthly reports that include the following data: (1) number of homes sold by type during the previous month; (2) average sales price by type for the previous month; and (3) current average selling time for homes, by type. Table A-14 shows the average selling price for homes in Bend, Medford, Portland, and Brookings between 1985 and 1989.

Evaluation The HUD apartment survey is only a representative sample and is not inclusive of all multifamily rental structures which may be available in any of the surveyed localities. However, the HUD survey is the best statewide comparison we could identify. Although the OMLS home sales price data does not include all homes sold in a particular area over time, it is the most complete standard source available that allows comparison between different parts of the state.

ANALYSIS Table A-13 below shows that the average monthly rent per multi-family dwelling unit in the Bend area grew from \$248 to \$325 between 1986 and 1988, resulting in an increase of about 31 percent. This increase was slightly more than the state as a whole over the same period. One measure of housing affordability is to compare median family income to average housing costs. According to the Bureau of Economic Analysis, median family income in Deschutes County increase by a total of about 8 percent between 1986 and 1988. This increase was about 18 percent less than the increase in rental rates in the Bend area.

Table A-14 below shows that the average home selling price in Bend increased from \$45,594 to \$67,583 between 1985 and 1989, an increase of about 48 percent. This increase was significantly more than experienced in the other case study areas and the state as a whole. Between 1986 and 1989, average home prices increased by a total of about 25 percent. By comparison, the median family income for Deschutes County increase by about 18 percent over the same period.

In short, the data show that, since the mid-1980s, the average Deschutes County family is spending an increasing percentage of their monthly income on housing costs. As the area continues to attract new residents from outside the state (especially retirees), shortages in low and medium family income housing may become apparent.

TABLE A-13

**AVERAGE MULTI-FAMILY DWELLING UNIT RENTAL RATES
BY CASE STUDY AREA AND STATEWIDE
1986-88**

Jurisdiction	1986		1987		1988		% Change	
	Avg. Rent	\$/Sq. Foot	Avg. Rent	\$/Sq. Foot	Avg. Rent	\$/Sq. Foot	Avg. Rent	\$/Sq. Foot
Bend	\$248	.293	\$277	.321	\$325	.376	31.1	28.3
Medford/Grants Pass	304	.398	324	.404	390	.464	28.3	16.6
Portland Metro	337	.416	376	.458	458	.540	35.9	29.8
Statewide	325	.411	344	.429	419	.507	28.9	23.4

Source: Oregon Rent and Vacancy Survey, U.S. Department of Housing and Urban Development.

TABLE A-14

**AVERAGE HOME SELLING PRICE
BY CASE STUDY AREA
1985-89**

Jurisdiction	1985	1986	1987	1988	1989	% Change
Bend	\$45,594	\$53,926	\$51,901	\$57,286	\$67,583	48.2
Medford	56,381	55,592	57,245	59,410	69,637	23.
Portland	70,015	NA	73,382	76,883	85,546	22.1
Brookings	NA	NA	NA	89,000	107,000	20.2

Source: Oregon Multiple Listings Service Annual Summary Reports, OMLS.

4.2 SOURCE Level of Service Estimates, Oregon Department of Transportation.

Description Table A-15 shows level of service and average daily traffic volume counts for two intersection on Highway 97 in Bend.

Evaluation Level of service (LOS) data is not compiled on a regular basis by ODOT, thus restricting the availability of LOS data. However, ODOT calculates LOS for highway improvement projects. The data presented in Table A-18 represent the only time-series data ODOT has for level of service in the Bend UGB. Note that data for the intersections in for different time frames (1985, 1989 and 1982, 1988). Level of service is a function of PM-peak traffic volumes and capacity.

ANALYSIS Table A-15 shows level of service and average daily traffic volumes for selected intersections in the Bend area. Our analysis shows that level of service decreased at both intersections. Average daily traffic volumes also increased between 22 and 40 percent at these intersections. The level of service data show that congestion increased along Highway 97 in Bend between 1982 and 1989.

TABLE A-15
LEVEL OF SERVICE AND TRAFFIC VOLUMES
At Selected Bend Intersections
1982, 1985, 1988, 1989

Intersection	Avg. Daily Traffic		% Change	LOS	
	1985	1989		1985	1989
Empire Blvd. and Hwy 97	30,149	36,862	22.3%	A	C
	1982	1988		1982	1988
3rd St. and Greenwood Ave.	31,521	44,327	40.6%	C	C-D

Source: Oregon Division of Transportation.

4.3 SOURCE

Oregon Air Quality, 1985-88 Annual Reports, Oregon Department of Environmental Quality, Air Quality Control Division.

Description Data that describe (1) the number of days various communities experienced pollution levels above the National Ambient Air Quality Standards, (2) annual area and point emission levels for Deschutes County and other case study counties across Oregon.

Table A-16 shows the number of days Bend, Medford, and Portland exceeded pollution levels above the National Ambient Air Quality Standards between 1984 and 1988.

Table A-17 shows the amount (tons) of (1) carbon oxide, (2) nitrogen oxides, and (3) total suspended particulate emitted by area and point source in Deschutes County and other case study counties across Oregon between 1984 and 1988. Point sources (e.g., rock quarries, and lumber mills) emit volumes of pollutants from a single stationary source. Area sources (e.g., wood-stoves and slash burns) emit pollutants over a broad geographic area.

Evaluation The State Department of Environmental Quality collects and maintains the most accurate air quality indicator data available. However, differences in area and point source emissions between 1985 and 1988 may be due, in part, to differences in measuring techniques.

ANALYSIS

Although emissions in Deschutes County appear to have increased over the past five years, air quality in the Bend area continues to meet or exceed state and federal ambient air quality standards. Although the data are inconclusive, there are two signs which lead DEQ staff to believe air quality may be improving in the Bend area: (1) field and slash burning decreased during the period 1985-89; and (2) Bend recently instituted a voluntary woodstove curtailment program.

TABLE A-16

**NUMBER OF DAYS EXCEEDING STANDARDS FOR CASE STUDY CITIES
1984-88**

City	1984	1985	1986	1987	1988
Fine Particulate (PM10)					
Bend	0	1	0	1	0
Medford	5	13	2	5	7
Portland	0	0	1	0	0

Source: Oregon Air Quality 1988 Annual Report, Oregon Department of Environmental Quality.

TABLE A-17
EMISSION INVENTORY SUMMARY BY COUNTY
1984 and 1988
(tons per year)

County	Type	Carbon Oxide		Nitrogen Oxides		Total Suspended Particulate	
		1984	1988	1984	1988	1984	1988
Jackson	Area	121,733	344,922	1,182	14,474	19,119	68,598
	Point	3,236	4,811	614	1,156	1,306	1,391
Deschutes	Area	40,284	101,231	3,197	4,718	8,252	17,683
	Point	917	686	259	206	1,136	1,028
Curry	Area	29,813	22,177	1,037	1,144	3,782	3,457
	Point	545	589	154	136	497	499
Portland Metro Area	Area	364,840	322,743	40,079	43,914	41,902	44,287
	Point	13,617	11,835	2,155	1,819	3,060	2,888
Clackamas	Area	101,923	81,593	10,609	10,837	14,880	14,729
	Point	625	500	306	331	571	493
Multnomah	Area	175,849	156,700	21,101	23,125	16,835	18,100
	Point	12,301	11,006	1,580	1,372	1,905	1,865
Washington	Area	87,068	84,450	9,079	9,952	10,167	11,458
	Point	691	329	269	116	584	530

Source: Oregon Air Quality Annual Report 1984 and 1988, Oregon Department of Environmental Quality.

4.4 SOURCE *Bend Park Acreage Data*, John Simpson, Bend Parks and Recreation Department.

Description The Bend park acreage data present acreages of developed and undeveloped park lands in the Bend UGB in 1989.

Table A-18 shows the amount (acres) of developed and undeveloped park acreage in the Bend UGB for 1985 and 1989.

Evaluation The Bend Parks and Recreation Department is the best data source for park acreage and in the Bend UGB.

ANALYSIS Table A-18 shows that the City of Bend had a total of 2,088 acres of parkland in 1989. Total park acreage increased by 17.5 percent between 1985 and 1989. In 1989, the Bend UGB contained about 1,398 acres of undeveloped parkland, about 25 percent more than in 1985.

TABLE A-18

**PARK ACREAGE IN THE BEND UGB
Administered by the City of Bend
1985 and 1989**

Category	Park Acreage		% Change
	1985	1989	
Intensive	82	85.8	4.63
Natural	582	603.6	3.71
Undeveloped	1,112	1,398.7	25.78
Total	1,776	2,088.1	17.57

Source: John Simpson, City of Bend Parks and Recreation Department

5.0 INFRASTRUCTURE INVESTMENT

5.1 SOURCE *Bend Area General Plan, Public Facilities Provisions, as amended through Resolution No. 1852.*

Discussions with City of Bend Planning Director.

Description The Public Facilities Provisions of the General Plan were prepared in 1987, as part of LCDC Periodic Review. Many of the listed projects have actually been completed or are under construction. Interviews with the City Planning Director clarified the status of each listed project.

Evaluation This section of the case study focuses on major sewer, water, storm drainage and transportation projects that have been deferred because of limited financing capability. In some of the case studies, the PFP process has not been completed, and this fact will be noted.

In each study, we have conferred with the local planning or public works staff to categorize each project identified in the PFP as follows:

- (1) Projects that have been constructed or are under construction. If the project falls in this category, it's funding has not been deferred for lack of funding.
- (2) Projects that have an assured funding source. Goal 14 requires that growth be "orderly and efficient," which implies geographic phasing of public facilities to support planned growth. Many communities rely on utility fees, local improvement districts, systems development charges and other means to make sure that projects are built to support development over time. Thus, the fact that a project has not yet been built, or that a project has been scheduled in the future, does not mean that the project has been "deferred" for lack of funding. For the purposes of this study, we assume that if funding will be available when the project is scheduled for construction in the PFP, then the project has not been deferred for lack of funding.
- (3) Projects that are necessary to support growth during the planning period, but have no assured source of funding. If the project does not fall into categories 1 or 2 above, then, for the purposes of this study, the project has been "deferred because of limited funding capability."

The capital costs for each project in the unfunded (deferred) category will be determined in 1990 dollars. The sum of the deferred capital costs then will be determined for each type of facility (sewer, water, storm drainage and transportation).

Once this gross figure has been determined, it will be compared with existing population and planned population growth, to determine the ratio of unfunded public facilities liabilities to size of the present and planned urban growth area.

ANALYSIS Oregon law requires that cities and urban counties prepare and adopt "public facilities plans" (PFP's) for their respective urban growth areas. The PFP must identify sanitary sewer, water, storm drainage, and transportation projects needed to accommodate growth through the 20-year planning period. Each PFP must also describe the project's cost, probable funding source and schedule. Longer-range PFP's are intended to serve as a basis for local capital

improvements programming, which in turn serve as a basis for the annual capital improvements budget.

One of the principal tenets of Oregon's land use program (see Goal 14: Urbanization) is that growth should be concentrated within urban growth boundaries (UGB's). As noted above, urban services are provided within UGB's consistent with the PFP. If public facilities needed to support urban growth cannot be provided by local governments in a timely manner because there is insufficient funding, growth pressures outside UGB's will increase, resulting in a less compact urban growth form.

Growth management means providing urban services in areas where growth is planned in a timely manner. Critical measures of the effectiveness of a growth management program are whether:

- (1) There has been a valid assessment of public facilities projects, their costs and their timing that are needed to accommodate long-range growth (i.e., has the community done a good job with the required PFP); and
- (2) Realistic funding sources for planned urban services have been identified.

To the extent that local governments have not determined public facilities needs and costs, or have relatively large unfunded public facilities liabilities, they are not effectively managing their growth.

With the exception of transportation facilities, the City of Bend has developed local mechanisms to fund the majority of the services needed to accommodate planned growth over the next 20 years.

Phase 1 of Bend's sewage treatment and collection system was funded by an EPA grant and local matching funding in the early 1980s. Phase 2 system expansion to urbanizable areas is intended to be self-supporting over time based primarily on sewer connection and user fees, developer contributions, and borrowing based on anticipated revenues from these sources.

Of \$5.6 million (1989 dollars) worth of planned sewer projects, approximately 16% are constructed or under construction, leaving 85% to be constructed over the next 10 to 20 years with local funding.

According to the Bend Area General Plan: "Bend is situated at the western edge of the high desert with about 10 inches of annual precipitation...due to the lack of clearly defined drainage basins and the lava terrain, the City plans to continue to use drill holes, dry wells and storm drains as needed [for storm drainage]. Future developments will be required to contain drainage on site. Therefore, no major drainage system has been defined as needed within the urban growth boundary."

Water projects amount to almost \$8 million. Of these, about \$.75 million have been constructed or are under construction. The remaining \$7 million worth of projects will be funded through the City's service charges, developer contributions, connection fees and local improvement districts.

Transportation projects represent Bend's most significant unfunded public facilities liability. The estimated costs for constructing major transportation projects (in 1989

dollars) is \$32.6 million.⁴ Only \$.5 million worth of projects have been constructed or are now under construction. \$16.9 million worth of projects are expected to be funded through ODOT, and have been listed as having a known funding source (state and federal grants with local support.)

However, the remaining \$15.3 million worth of major transportation projects must rely exclusively on local funding sources. For this reason, they have been listed in the "unfunded" category. As with other Oregon communities, the lack of funding for key transportation facilities is a significant impediment to planned growth.

⁴Our figures do not include the \$50 million Bend Parkway that is now being considered.

**TABLE A-19
BEND PUBLIC FACILITIES FUNDING**

Project	Status	Cost (1989\$)	Funding Source
SANITARY SEWER			
SW Blakely Road - Roosevelt to Reed Lane	F	860,640	Developer/User Fees/LIDs/Connection Fees
Forbes Road	F	69,927	Developer/User Fees/LIDs/Connection Fees
4th - Addison Tie In - 4th to Studio Road	F	89,291	Developer/User Fees/LIDs/Connection Fees
Pilot Butte Interceptor - Medical Center Drive	F	247,434	Developer/User Fees/LIDs/Connection Fees
27th Street Interceptor - Butler Market to Conner	C	393,743	User Fees/Connection Fees/LIDs
SE 9th Street - Wilson to Reed Market Road	F	161,370	Developer/User Fees/LIDs/Connection Fees
Brosterhous Road - Highway 97 to Trap Club	F	193,644	Developer/User Fees/LIDs/Connection Fees
Simpson Avenue - 15th to Westside arterial	F	242,055	Developer/User Fees/LIDs/Connection Fees
Westside arterial - Shelvin Park Rd. South	F	618,585	Developer/User Fees/LIDs/Connection Fees
North Interceptor - Yeoman to Mt. View Mall	C	511,005	User Fees
Century Drive extension - Mt. Bachelor Village to Sunrise	F	215,160	Developer/User Fees/LIDs/Connection Fees
Awbrey Butte interceptor system	F	1,398,540	Developer/User Fees/LIDs/Connection Fees
Brinson Road main	F	123,717	Developer/User Fees/LIDs/Connection Fees
Brinson Park main - canal to Boyd Acres	F	295,845	Developer/User Fees/LIDs/Connection Fees
Riverhouse pump expansion	F	161,370	Developer/User Fees/LIDs/Connection Fees
Hwy. 97 South extension to Pinebrook Blvd.	F	53,790	Developer/User Fees/LIDs/Connection Fees
SUBTOTAL - UNDER CONSTRUCTION (C)		904,748	
SUBTOTAL - KNOWN FUNDING SOURCE (F)		4,731,368	
SUBTOTAL - UNKNOWN FUNDING SOURCE (U)		0	
DRAINAGE			
SUBTOTAL - UNDER CONSTRUCTION (C)		0	
SUBTOTAL - KNOWN FUNDING SOURCE (F)		0	
SUBTOTAL - UNKNOWN FUNDING SOURCE (U)		0	

Project	Status	Cost (1989\$)	Funding Source
WATER SYSTEM			
Butler Market Road - Studio to Boyd Center	F	58,179	User Fees/Connection Fees\Developer Contributions\LIDs
Boyd Acres Road (north), 12", Empire to Fred Meyer	F	23,272	User Fees/Connection Fees\Developer Contributions\LIDs
Silver Lake Blvd., 12", Mckinley to Hayes	F	15,338	User Fees/Connection Fees\Developer Contributions\LIDs
Studio Road - 12", Ravenwood to Boyd	F	24,329	User Fees/Connection Fees\Developer Contributions\LIDs
Forbes Road, 12", Hawthorne to City Shops	F	38,081	User Fees/Connection Fees\Developer Contributions\LIDs
Reed Market, 12", Highway 97 to Teakwood	F	253,872	User Fees/Connection Fees\Developer Contributions\LIDs
15th Street, 12", Reed Market to existing system	F	26,445	User Fees/Connection Fees\Developer Contributions\LIDs
9th. 12", Wilson to Reed	F	88,855	User Fees/Connection Fees\Developer Contributions\LIDs
Boyd Acres Road (south), 12", Murray Rd. to Studio	F	105,780	State Lottery Funds
Bear Creek Road, 12", 15th to Hwy. 20	F	317,340	User Fees/Connection Fees\Developer Contributions\LIDs
Deschutes Business to Mountain View Mall, 12"	F	58,179	User Fees/Connection Fees\Developer Contributions\LIDs
River Crossing, Colorado to McKinley, 16"	F	158,670	User Fees/Connection Fees\Developer Contributions\LIDs
Parrell Road, 12", Reed Mkt. to Badger	F	82,508	User Fees/Connection Fees\Developer Contributions\LIDs
Butler Market, 12", Tamarack Park to 27th Street	F	174,537	User Fees/Connection Fees\Developer Contributions\LIDs
27th Street, 12", Butler Market Road to Conner	C	174,537	LID

Project	Status	Cost (1989\$)	Funding Source
Transmission line replacement, 20", (3-4 miles)	F	564,865	User Fees/Connection Fees\Developer Contributions\LIDs
Division Street, Empire to Butler Market, 12"	F	105,780	User Fees/Connection Fees\Developer Contributions\LIDs
Newport, river to 9th, replacement, 12"	F	65,584	User Fees/Connection Fees\Developer Contributions\LIDs
Westside arterial loop, 12"	F	740,460	User Fees/Connection Fees\Developer Contributions\LIDs
Awbrey Butte system, 10" & 12"	F	1,184,736	User Fees/Connection Fees\Developer Contributions\LIDs
N. Hwy. 97 replacement, O.B. Riley to State Highway Shops, 12"	F	75,104	User Fees/Connection Fees\Developer Contributions\LIDs
Empire Blvd., Boyd Acres to Yeoman and Yeoman, Empire to Butler, 12"	F	338,496	User Fees/Connection Fees\Developer Contributions\LIDs
Brinson Blvd., Mercury Ct. to Butler Market, 12"	F	95,202	User Fees/Connection Fees\Developer Contributions\LIDs
A.K. Briggs Road, Mt Washington to O.B. Riley, 12"	F	105,780	User Fees/Connection Fees\Developer Contributions\LIDs
Boyd Acres Road, Brinson to Builders	F	31,734	User Fees/Connection Fees\Developer Contributions\LIDs
WELLS, PUMPS, RESERVOIRS - SHORT TERM			
3rd Street pump rebuild	F	264,450	User Fees/Connection Fees\Developer Contributions\LIDs
Colorado Ave. pump station	F	296,184	User Fees/Connection Fees\Developer Contributions\LIDs
Eastside Well	F	793,350	User Fees/Connection Fees\Developer Contributions\LIDs

Project	Status	Cost (1989\$)	Funding Source
Telemetry	F	211,560	User Fees/Connection Fees\Developer Contributions\LIDs
Awbrey Butte reservoir, 1 mg	F	264,450	User Fees/Connection Fees\Developer Contributions\LIDs
Century Drive, 1 mg	F	264,450	User Fees/Connection Fees\Developer Contributions\LIDs
Overturf Butte, 5 mg	F	185,150	User Fees/Connection Fees\Developer Contributions\LIDs
Rock Bluff Reservoir	C	400,000	National Forest/Property Sales\General Fund
4th Well	C	250,000	National Forest/Property Sales\General Fund
SUBTOTAL - UNDER CONSTRUCTION (C)		759,687	
SUBTOTAL - KNOWN FUNDING SOURCE (F)		7,077,570	
SUBTOTAL - UNKNOWN FUNDING SOURCE (U)		0	

Project	Status	Cost (1989\$)	Funding Source
TRANSPORTATION - ARTERIAL AND COLLECTOR STREETS			
Hwy. 97, Murphy Rd. to Lava Butte - widen to 5 lanes	F	6,132,060	ODOT
15th Street, Ferguson Road. to Reed Market Rd.	U	290,466	County
Reed Market, BNRD to Fargo - widen, bikepath, sidewalk	U	618,585	County
8th-9th connector - realign 9th to intersect 8th at Emerson, pave, curb, sidewalk	C	210,000	National Forest Revenue/Property Sales/General Fund
Hwy. 97/3rd St. underpass - widen to 4 lanes	F	3,765,300	ODOT
Highway 97, Highway 20, north to UGB, widen to 4 lanes	F	2,581,920	ODOT
Cooley Road - Boyd Acres to Deschutes Market	U	892,914	County
Empire Blvd. - end of pavement to O.B. Riley	U	182,886	County
Empire Blvd. - Boyd Acres to Yeoman Rd.	U	774,576	County
Frontage Road between Cooley Rd. and Hwy. 20	U	232,373	County
Frontage Road, Empire North to Mt. View Mall entrance	U	6,455	
Division St., Boyd Center Rd. to Empire Ave.	U	591,690	County
Division St., Empire to Hwy. 20/97	F	301,224	ODOT
Hwy. 20, 12th St. to Powell Butte Rd., widen	F	2,689,500	ODOT
Hwy. 20, Deschutes River to Hwy. 97 intersection, widen	F	982,205	ODOT
Division St., canals to Boyd center Rd., grade, pave, bridge, sidewalk	U	430,320	City/County/State
Butler Mkt. Rd., Hwy. 97 to Studio Rd., grade, pave bridge canals, curbs, sidewalks	U	301,224	City/County/State
Wilson Ave., 5th to Division - widen, improve radius, sidewalk	F	306,603	ODOT/County
Murphy Rd., fire station to Brosterhouse, grade, pave, sidewalks, 2 lanes plus turn lanes at intersection	C	250,000	National Forest Funds
Murphy Rd., Brosterhouse to 15th	U	182,886	
Brosterhouse realignment - grade, pave, sidewalk, 2 lanes	U	796,092	County
Ferguson, 27th west to existing road - realign	U	37,653	County
Portland to Penn - grade, pave, sidewalk, 2-3 lanes	U	799,319	City
Purcell, Wells Acres to Butler Market	U	92,304	City
Mt. Washington, Valhalla to Deschutes River, grade, pave, sidewalk, bikepath	U	1,857,261	City
Williamson, Hwy. 20 to Bear Creek	U	91,443	County
Mt. Washington, Shelvin Park Rd. south to Century Drive, grade, pave, sidewalk, bikepath	U	985,433	County/City
Bear Creek, realign through to Franklin	U	107,580	City

Project	Status	Cost (1989\$)	Funding Source
Shelvin Park Road, College Way to Valhalla	U	374,378	City
15th Street, Bear Creek to Hwy. 20	U	138,778	City
Neff Road, 27th to Hamby Road	U	629,343	County/City
Bear Creek, Craven to SE 27th Street	U	376,530	County
Newport, College Way to Deschutes river	U	311,982	City
Simpson Avenue, dump west to Mt. Washington	U	256,040	County
Century Drive, Colorado south to UGB, widen	F	107,580	ODOT
NW 9th St., Newport to Trenton	U	117,047	City
Brinson, Butler Mkt. to Brinson	U	322,740	County
Wells Acres, Purcell to 27th	U	165,673	City
Purcell, Neff to Williamson	U	124,793	City
Parrell Road, Brosterhous to China Hat	U	1,048,905	
Blakeley Rd./Brookwood, Arthur to Ponderosa	U	537,900	
Hawthorne, Division to Hill	U	11,081	
Skyline, Mt. Washington to Mt. Washington	U	598,252	
Arthur Ave., Blakely to Century Drive	U	710,028	
Arthur Ave., Hwy. 97 to Division	U	43,032	
Arthur Ave., Division to Blakely	U	268,950	
SUBTOTAL - UNDER CONSTRUCTION (C)		460,000	
SUBTOTAL - KNOWN FUNDING SOURCE (F)		16,866,392	
SUBTOTAL - UNKNOWN FUNDING SOURCE (U)		15,306,913	
TOTAL ALL PROJECTS			
TOTAL - UNDER CONSTRUCTION (C) 5%		2,124,435	
TOTAL - KNOWN FUNDING SOURCE (F) 62%		28,675,330	
TOTAL - UNKNOWN FUNDING SOURCE (U) 33%		15,306,913	

6.0 DEVELOPMENT POTENTIAL

6.1 SOURCE

Deschutes County Assessment Data 1985-89, Deschutes County Assessor's Department; DLCDC records for resource and non-resource dwellings as reported by Deschutes County.

Description: Table A-20 shows (1) the number of vacant parcels that are zoned for residential use and located outside of UGBs and (2) the number of dwellings units in resource zones reported to LCDC by Deschutes County from 1986 to 1990. Vacant parcels don't have a dwelling unit. Estimated dwellings in resource zones are the number of dwellings that we estimate will be approved in resource zoned through the year 2000. Total development potential is the combined number of vacant parcels and estimated number of dwellings that will be constructed in resource zones. Resource dwelling approval data was obtained from the Department of Land Conservation and Development.

Because only about 25 percent of the assessment records included acreage for individual parcels, we were not able to determine the average parcel size for all parcels located within residential zones outside of UGBs. However, Table A-21 shows the average parcel size for the records that did have acreage figures. Table A-21 also shows the number of records that did have the parcel size.

Evaluation: The Deschutes County assessment records are the only automated data source available to us. However, many of the records were not complete. Because of incomplete information we were unable to address two important factors: (1) the characteristics of vacant parcels that are located within subdivisions that were created prior to adoption of the State Planning Goals ("sagebrush subdivisions"), and (2) the number of parcels that can be created by further land divisions under current zoning.

On the one hand, vacant parcels in sagebrush subdivisions may not be buildable because of they lack water or adequate area for septic drainfields, or are otherwise constrained. The questionable buildability of small-acreage subdivision lots reduces development potential. On the other hand, many of the parcels outside of sagebrush subdivisions have the potential for further division under current zoning.⁵ We assume that these two factors (sagebrush subdivision vs. development potential through new land divisions) cancel each other out. We rely only on the number of vacant lots for estimating development potential in rural residential areas. When better information becomes available as a result of Deschutes County's data management efforts, a more reliable figure can be expected. In the meantime, the number of vacant lots in residential zones is the best available estimate of rural residential development potential.

⁵This is demonstrated in Table 6-2, which shows the average parcel size for parcels within rural residential zones. We have serious doubts about the credibility of this data, since it shows average lot sizes in exceptions areas of around 50 acres. Nevertheless, determining the number of parcels that can be created by land divisions increases development potential. A comparison with the Portland study area is useful. In areas zoned for rural residential use in Clackamas, Washington and Multnomah Counties, the ratio of existing vacant lots to potential new lots resulting from land divisions was 6:4; i.e., it was estimated that 60% of new rural residential units would be built on existing vacant lots, and 40% would be built on new lots created through the land division process.

METHOD

We estimated the development potential outside of UGBs for the other study areas by determining (1) the total number of vacant lots, (2) the number of lots occupied by a dwelling unit, and (3) the potential number of new lots that can be created by further partitions or subdivisions. We then combined the number of vacant lots and the number of potential new lots to determine the development potential outside of Urban Growth Boundaries. Because the assessment records for Deschutes County were incomplete, we were unable to use this method. The assessment records did provide the number of vacant lots, and for the reasons stated above, we believe this to be a rough indication of the development potential in Deschutes County.

ANALYSIS

We used year-built data to determine the number of vacant parcels within exception areas that are zoned for residential development. Table A-20 shows that there are 12,208 vacant parcels. DLCD data indicates about 280 dwellings were approved on resource lands from 1986 to 1990. However, County Assessor's records indicate that 504 dwelling units were constructed on resource land from 1985 through 1989. We estimate that 560 dwellings will be approved in resource zones by the year 2000⁶. Combining development potential for resource lands and rural residential lands, we estimate that the development potential outside of Urban Growth Boundaries is 12,768 dwelling units.

Our estimate for Deschutes County does not account for vacant lots that are located within sagebrush subdivisions. Accounting for these parcels would reduce our estimate for development potential. Although many of these lots cannot be individually developed now, it may be possible to develop more of them in the future as technology advances (e.g., sand filters). We have not accounted for undevelopable, smaller lots in any of the other study areas. Further, our estimate does not include the potential for creating new parcels through partitions or subdivisions. For those assessment records that included individual parcel size, the average parcel is extremely large. For example, the average parcel size in the RR zone is 121.79 acres; the average parcel size in the MUA zone is 83.88 acres. This data is not believable, because lots of such size would have been zoned for resource use. We cannot determine from assessor's records how many residentially-zoned lots can be re-divided. We do know that in other counties, a substantial number of lots were large enough to be further divided. On balance, we believe that our estimates provide a fair indication of development potential outside of UGBs in Deschutes County.

For purposes of comparison our estimated rural development potential for the tri-county Portland Metro area (Clackamas, Washington, and Multnomah Counties) is 9,788 dwelling units. This estimate included the potential for new lots created by land divisions and the potential for dwellings on resource lands--and did not subtract for pre-existing subdivision lots that may be unbuildable.

⁶This 560 unit figure is for ten years, and is twice number of dwelling units on resource land for the last five years reported by Deschutes County to LCDC.

TABLE A-20

**RESIDUAL DEVELOPMENT POTENTIAL
OUTSIDE URBAN GROWTH BOUNDARIES**

Residential Zones - within Exception Areas		Projected Approved Dwellings in Resource Zones ¹ to the Year 2000	Estimated Total Development Potential Outside of Urban Growth Boundaries ²
Vacant Lots -1980	Vacant Lots -1990		
15,037	12,208	560	12,768

Source: Deschutes County Assessment Records; Land Conservation and Development Commission; Development Potential estimates by ECO Northwest

¹See 6.2 for complete description of dwelling approvals in resource zones.

²Estimate is extrapolated from data provided by DLCDC.

TABLE A-21

**AVERAGE PARCEL SIZE
RESIDENTIAL ZONES WITHIN EXCEPTION AREAS¹**

Zone	Vacant Parcels			Developed Parcels		
	Number of Parcels	Total Acres	Average Parcel Size	Number of Parcels	Total Acres	Average Parcel Size
MUA	651	54,608	83.88	1,547	86,247	55.75
RR	308	37,513	121.79	353	16,212	45.93
RR1	643	70,215	109.20	446	28,697	64.34
RSR	74	2,308	31.20	148	2,318	15.66

Source: Deschutes County Assessment Records.

¹Approximately 25 percent of the assessment records included acreage figures for individual parcels. We report this data to illustrate how unreliable assessor's records for determining lot area. We have not relied on this data for determining development potential from further land divisions.

63 SOURCE Land Conservation and Development Commission, 1990.

Description: Table A-22 shows the number of dwelling units that were approved in resource zones for the period of 7/85 through 8/90. The table does not include farm help dwellings.

Evaluation: The figures provided by LCDC are the most current available. Because Deschutes County did not differentiate between resource and non-resource dwellings before 1987, some of the farm dwellings that were approved may actually have been nonfarm dwellings.

ANALYSIS For the period of 7/85 through 8/90, Deschutes County reported to LCDC the approval of 280 dwelling units in resource zones. The data provided by LCDC show that the number of nonfarm dwellings approvals has increased every year, and increased by 200 percent between 1988/89 and 1989/90. Also, during the period of 9/89 through 8/90 over twice as many nonfarm dwellings were approved compared with farm dwellings.

Based on the LCDC data, there is the potential for an additional 560 dwelling units, if dwelling approvals continue at the same rate to the year 2000.

TABLE A-22

DWELLING UNIT APPROVALS IN RESOURCE ZONES

Year	Farm Dwellings	Non-farm Dwellings	Forest Dwellings	Non-forest Dwellings
7/85 - 6/86 ¹	57	0	0	0
9/87 - 8/88	19	20	0	0
9/88 - 8/89	37	25	0	0
9/89 - 8/90	37	75	3	7
TOTAL	150	120	3	7

Source: Land Conservation and Development Commission

¹Before 1987, Deschutes County did not differentiate between resource and non-resource dwellings.

