Section 6 of Ordinance 2271

Exhibit F

Amendments to the text of the Preface and Chapters 1, 2, 3, 4, 8, 9, and 10

of the Bend Comprehensive Plan

Preface

Adopted Amendments

EFFECTIVE DATE	ORD #	CHANGES
November 1998	Resolution #2247	Plan Update
July 5, 2006	NS-2017	
2016	NS-2271	Format update, minor text changes to outdated text

BACKGROUND

Context

Bend is located at the base of the Cascade Mountains at an elevation of 3,600 feet. Its proximity to the Deschutes National Forest, the high mountain lakes, and to the Great Basin plateau makes it a hub for recreation, sporting, and tourist activities.

Bend is the largest urban area in Oregon east of the Cascade Mountains with an approximate population of 79,985 at the start of the 2008-28 planning period. By the year 2028, the urban area population is expected to reach 110,000 persons, with another 10,000 persons within three miles of the urban area.

Bend is the regional trade and service center for Central Oregon. More than two-thirds of all the jobs in the county are in Bend. The wide range of retail businesses, professional and trade services, and specialty trades draws in customers from a five county area.

Purpose of the Comprehensive Plan

The Bend Comprehensive Plan is a guide for making wise land use decisions regarding future development within the Urban Growth Boundary. Chapter 1, Plan Management and Citizen Involvement, provides additional information on the Urban Growth Boundary.

The Plan's goals and policies provide a framework for decisions that are consistent with the physical characteristics, goals, and resources of the community. The basic aim of the Comprehensive Plan is to organize and coordinate complex inter-relationships between people, land, resources, and facilities to meet the future needs of the citizens and to protect the livability of the community.

The Comprehensive Plan is intended for use by local officials, persons with development interests, neighborhood groups, state and federal agencies, and citizens of the community. The Plan provides interesting and factual information about the community's natural features, housing, economic conditions, and topics.
With the rapid population and economic growth of Bend during the 1990s, the community is significantly different from the quiet lumber and agricultural town of the 1950s and 1960s. Similarly, the future look and feel of the community ten or twenty years into the next century will be different from the 1990s. As Bend continues to become more urban in its character, the impact and influence of change will be with us constantly. The Bend Comprehensive Plan is a tool to prescribe how and where change should happen.

Development of the Plan

The first long range, comprehensive plan for the urban area, officially known as the Bend Comprehensive Plan, was prepared in 1974, and approved by the Oregon Land Conservation and Development Commission in 1981. A state mandated "periodic review" of the Plan was conducted in 1989 to bring it into conformance with new state

laws and rules. Aside from the periodic review additions and a few other changes, most of the Comprehensive Plan remained unchanged until the late 1990s.

In early 1994 the City Council and Board of County Commissioners agreed to undertake a major update of the Comprehensive Plan, and this update was completed in 1998. The need to update the Comprehensive Plan in the 1990s was driven by several factors:

- The rapid population growth the community was experiencing;
- New city water and sewer system master plans;
- Several proposed big private or public projects that needed to be tied into the broader community planning;
- New public uses at the edge of the urban area;
- New planning requirements imposed by the state legislature and state agencies;
- Information in the Plan that needed to be updated or deleted; and
- New, important issues to the community that needed to be addressed in the Plan.

The City Council and Board of County Commissioners appointed a 20 person advisory committee, representing a broad cross-section of the community, to guide the update of the Plan. This committee spent 2 ½ years and more than 1,100 person-hours, updating and revising the Comprehensive Plan. The advisory committee prepared an overall vision statement, repeated below, that guided their review of the Plan.

Comprehensive Plan Vision

Bend is a community valuing its natural features of trees, rocks, river, sounds, views and a diverse citizenry that works together creating a healthy legacy and vision for Bend's future livability. The Bend Comprehensive Plan is designed to preserve and enhance this vision for our community.

The city and county also used a variety of activities to provide opportunities for citizens to learn about, and participate in, the update of the Comprehensive Plan. The major activities were:

- Community wide workshops in 1995, coordinated with the local school district and parks district, to discuss planning ideas and gather comments;
- Four community Open Houses in 1997, again coordinated with the school and parks district, to provide information on proposed changes to the Comprehensive Plan;
- Informational flyers, surveys, newspaper articles and other media events in the summer of 1997 to provide information on the updated Comprehensive Plan;

- A survey of more than 210 households regarding their opinions on the urban area transportation system;
- Workshops on both general and specific transportation issues;
- A series of neighborhood planning workshops hosted by Deschutes County and supported by state grants for two areas that will undergo urban redevelopment;
- Numerous presentations to service groups, organizations, and neighborhoods; and
- Several public hearings on the Comprehensive Plan in 1997 and 1998.

A 20-year Plan

The Comprehensive Plan uses a 20+ year planning period that ends in the year 2020. This time frame was used in order to satisfy state requirements for evaluating the 20-year need for some land uses, and because it is about the outside limit for reasonable planning forecasts.

The Comprehensive Plan is not a "saturation plan" that describes conditions under a full or ultimate development of lands within the urban area. Rather, it forecasts the level of population and economic growth to the year 2020 and plans for this growth along with other community needs and desires during the planning period. The Comprehensive Plan establishes land use categories to meet the forecasted needs and maps where these uses shall occur. The zoning for land within the urban planning area must be consistent with the designated land use categories in the Comprehensive Plan.

However, some lands near the edge of the urban area that are without full urban services may have an interim, less intense zoning classification applied to them until full urban services are available to the area.

Format of the Plan

The Comprehensive Plan is divided into this Preface, eleven chapters and the appendices. Each chapter covers a general topic, and most chapters include historic data and forecasts of conditions during the 20-year planning horizon. Background documents or analysis used in the preparation of a chapter are typically not included in the chapter, but cited as a reference or included in the appendices. Background documents are available for review at the City of Bend Development Services Department.

At the end of each chapter are policies that address issues discussed in the chapter. The policies in the Comprehensive Plan are statements of public policy, and are used to evaluate any proposed changes to the Comprehensive Plan. Often these statements are expressed in mandatory fashion using the word "shall", "will" or "must". These statements of policy shall be interpreted to recognize that the actual implementation of the policies will be accomplished by land use regulations such as the city's zoning ordinance, subdivision ordinance and the like. The realization of these policies is subject to the practical constraints of the city such as availability of funds and compliance of all applicable federal and state laws, rules and regulations, and constitutional limitations.

The Comprehensive Plan policies provide a basis for coordinated action by enabling

various public and private interests to undertake specific projects with a consistent understanding of community expectations. Public facilities such as schools, parks, streets, water and sewer systems, civic areas, libraries, and fire stations can be planned in advance of need. A program for land acquisition and construction also can be prepared in advance of need so that the services will be available when and where they are needed. Similarly, special service districts and private utilities can anticipate future service demands and plan facilities so that development can take place in the most economical and timely manner.

These same community policies serve individual property owners and private interest groups as a means of evaluating their individual decisions in light of community objectives. They are able to determine how their individual interests can best be served in a manner that is consistent with the Bend Comprehensive Plan.

Although set up as chapters, the whole Plan is inter-related to form a comprehensive approach to land use planning. No part of the Plan can be viewed without consideration of the other areas of the Plan. Through the eleven chapters and related maps, the Comprehensive Plan meets all the requirements of the 14 applicable planning goals in the state's land use laws and administrative rules.

Plan Maps

The Plan text and policies describe several land use categories that provide for the various types of development expected to occur within the urban area during the 20-year planning period. These land use categories are graphically portrayed on the **Comprehensive Plan Map**.

The major land use categories - residential, commercial, industrial, and mixed-use have very specific boundaries that are shown on the Comprehensive Plan Map. The city and county apply zoning to property based on the Comprehensive Plan Map categories. Changing these boundaries requires a formal amendment to the Comprehensive Plan.

The **Transportation System** is shown on a series of three maps that illustrate different parts of the urban area's multi-modal transportation system. The *Bend Urban Area Transportation Plan Map* shows the existing and future alignments for the arterial and collector street system. The *Bicycle and Trail System Map* shows the existing and future transportation and recreation designated routes within the urban area. Most of the bicycle routes are on arterial and collector streets, but other off-street trail routes are also shown. For a more detailed discussion of these maps see Chapter 7, *Transportation Systems*. The Transit System Map shows a feasible urban area transit route system. For a more detailed discussion of these maps see Chapter 7, Transportation Systems.

Also included in the Plan are other small maps that help to identify or better explain a topic discussed in the chapter. The Destination Resort map in the *Housing and Residential Lands* chapter, and the public parks map in the *Community Connections* chapter, are examples of these types of maps.

Future Plan Updates

The Comprehensive Plan is a document that changes over time to reflect new information and new directions for the future. Amendments or additions to the Comprehensive Plan text, exhibits, and policies go through a public hearing and review process before being adopted by the governing bodies. Changes and updates can be generated in at least six ways:

- ❑ *Regularly scheduled reviews and updates by the city and county*. Every five years, beginning in the year 2000, the city and county will review the population growth, the housing mix and acreage needs, the industrial lands absorption, and the commercial lands absorption against the long-term forecasts in the Comprehensive Plan. Other issues may also be evaluated during these regular views.

- ❑ *Preparation of more detailed refinement plans for neighborhoods or geographic areas.* As provided for in Oregon land use law, the city or county may prepare more detailed land use and development plans for parts of the urban area that have large vacant or under-utilized parcels. Such refinement plans could address future street patterns and other utility systems, housing density and compatible uses, site and design standards, locations for parks, schools, and open space, and other land use issues.

- ❑ *Evaluation of land use topics required to be reviewed under the Oregon Land Conservation and Development Commissions periodic review of the Comprehensive Plan*. The state requires all local plans to be updated periodically to comply with applicable new state laws, administrative rules, or to incorporate new data available to the state.

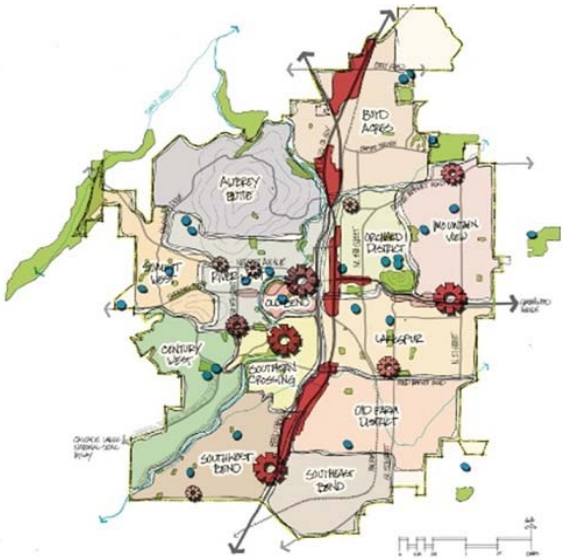
- ❑ *Other state laws or legislative actions that require changes to the Plan outside of the normal periodic review cycle*. The state legislature or the voter referendum/initiative process can require changes to local land use plans within a specific time period.

- ❑ *City or county response to new issues or changes*. Issues that were unforeseen during the development of the plan can arise that have an impact on a particular neighborhood or the whole urban area. The city and county officials can direct staff to amend the Plan to address these issues.

- ❑ *Changes proposed by individuals or other agencies*. A proposal by an individual, corporation, or public agency to change to the Plan text, land use map, other exhibits, or policies shall be considered as determined by the procedures ordinance. A person or agency proposing a change has the burden to demonstrate a public need and benefit for the change.

Chapter 1, *Plan Management and Citizen Involvement*, has more information on managing growth within the urban area, and how citizens can participate in planning for our community.

Chapter 1: Plan Management and Citizen Involvement



Adopted Amendments

EFFECTIVE DATE	ORD #	CHANGES
November 1998	Resolution #2247	Comprehensive Plan Update
2016	NS-2271	Format, update, minor text changes to remove outdated text

BACKGROUND

Context

Goals in the Comprehensive Plan express what our residents hope and want Bend to be like in the future. These goals were created through a major update of the Comprehensive Plan in 1995-1998 and further enhanced in 2016 with the UGB expansion. The goals set forth below provide general guidance for improving the character and quality of the Bend area as growth occurs. In addition to these goals, most of the other chapters in the Plan include goals that are specific to the chapter topic.

Community Goals

Create and Preserve Great Neighborhoods
Bend has a variety of great neighborhoods that promote a sense of community and are well-designed, safe, walkable, and include local schools and parks. Small neighborhood centers provide local shops, a mix of housing types, and community gathering places. The character of historic neighborhoods is protected and infill development is compatible.

Protect and Enhance Bend's Natural Beauty, Heritage and Natural Environment
As Bend grows, it preserves and enhances natural areas and wildlife habitat. Protect and enhance Bend's natural beauty noting especially the trees, rocks, rivers, view, sounds and historic structures. Wildfire risk management is a key consideration. Bend takes a balanced approach to environmental protection and building a great city.

Plan and Sustain a Strong Diverse Economy
Bend has a good supply of serviced land planned for employment growth that supports the City's economic development goals, provides a range of diverse jobs and industries, and supports innovation. Employment areas, large and small, have excellent transportation access. Opportunities are created for a stable, vital and diverse economy while sustaining Bend's environment/ecological support systems.

Create Housing Options and Affordability
Bend residents have access to a variety of high quality housing options, including housing affordable to people with a range of incomes and housing suitable to seniors, families, people with special needs, and others. Housing design is innovative and energy efficient.

Foster a Balanced Transportation System
Bend's balanced transportation system incorporates an improved, well-connected system of facilities for walking, bicycling, and public transit, while also providing a reliable system for drivers. Bend's transportation system emphasizes safety and convenience for users of all types and ages. Transportation and land use are integrated to foster livability.

Ensure Quality Design and Attractive Development
Ensure that the "built environment" is as attractive as feasible.

Preserve and Enhance a Strong Active Downtown
Bend's downtown continues to be an active focal point for residents and visitors with strong businesses, urban housing, civic services, arts and cultural opportunities, and gathering places. Parking downtown is adequate and strategically located. Planning in other areas continues to support a healthy downtown.

Create Connections to Recreation and Nature
Bend continues to enhance its network of parks, trails, greenbelts, recreational facilities, and scenic views inside and outside the city.

Build Cost Effective Infrastructure
Bend plans and builds water, wastewater, storm water, transportation, and green infrastructure in a cost-effective way that supports other project goals. Efficient use of existing infrastructure is a top priority.

Promote Public and Civic Involvement
Encourage involvement by all citizens, corporate and individual, to keep the city vital and the Plan an "evolving vision".

Create Clear and Consistent Implementing Ordinances
Implement the plan through effective, clear and consistent ordinances and language that reflect the intent of the vision.

Managing Growth

Oregon's land use planning program employs land use Goals and administrative rules to guide the efficient planning and development of urban areas. Generally speaking, the major land use needs are planned and allocated within the area, and then urban facilities such as sewer, water, and transportation systems, are designed to support the planned land uses. However, since Bend is a regional economic center and a tourist destination, its street system must support an exceptional number of vehicle trips. This pressure on the transportation system from both internal and external sources requires the city and county to be more thoughtful in tying together land uses and their transportation impacts.

The transportation ⇔ land use connection
Within the Bend urban area there are several physical features that constrict the development of the transportation system, thereby channeling street traffic to a few key routes. Any efforts the city and county can take to reduce or mitigate traffic congestion on the main routes will help Bend remain a place in which people enjoy living and working. The items below provide a brief overview of how the planning of land use and transportation are inter- connected in the Comprehensive Plan. Chapter 7, *Transportation Systems*, provides a more thorough and detailed description of the urban area transportation systems, and their relationship to land uses.

To support a cost effective and balanced land use and transportation system during the 20-year planning horizon the Comprehensive Plan provides for:

- making other types of transportation systems more accessible and more functional through the development of a fixed-route or on-demand or other transit system, completion of the sidewalk system, and adding bike lanes and off-street trails;
- having pedestrian and public transit supportive design standards for commercial developments;
- designating several small commercial centers throughout the community to offer convenient shopping and services within walking distance or short driving distance of neighborhoods;
- adding medium density housing around the new commercial centers to support the centers and offer more opportunities for people to live close to services;
- designing more efficient and creative residential developments that also allow for more compact growth, including the use of neighborhood refinement plans to guide such development;
- supporting residential "in-fill" development, while assuring compatibility with existing residential neighborhoods;
- improving the connection of streets and/or pedestrian corridors within and through neighborhoods to reduce unnecessary out-of-direction trips;
- public policy that encourages the joint siting of new schools and parks for more efficient land use, and also to better link schools with after-school recreation programs; and
- locating new elementary schools and new parks within convenient distance of residential areas served by those facilities.

Urban Growth Boundary

Cities and counties agree on an *Urban Growth Boundary* that separates future urban level development from rural development during the planning period. The Urban Growth Boundary (UGB) is shown on the Comprehensive Plan Map and other maps. A small scale map of the urban area, which shows the UGB, is presented as Figure 1-1 on page 6. In total, the UGB encompasses approximately 33.32 square miles, or about 21,322.2 acres. The UGB expansion will increase the urbanizable area by 2,380 acres.

The amount and type of land within the 1981 state approved UGB was evaluated during the 1994-1998 update process and again during the 2005-2008 UGB Expansion. Based on the analysis for the UGB Expansion, it was determined that there was insufficient buildable land within the boundary to meet the forecast housing and employment needs during the planning period.

The city and county experienced rapid growth between 1998 and 2008. This accelerated growth brought more dramatic changes to the community than have occurred since settlement began approximately 110 years ago. In addition to providing

more land for needed housing and employment, several new schools and public parks will have to be built. Many miles of streets, sewer, water, and electrical lines will have to be installed to support future growth. Much of what is now undeveloped land will become housing, commercial, industrial, or other urban uses. These changes offer both the opportunities for improving the community, and the challenges of maintaining its social and natural character.

The purposes of the Urban Growth Boundary and urbanization policies at the end of this chapter are to promote efficiency in the future growth and development, and to conserve resources by infilling the existing urban area.

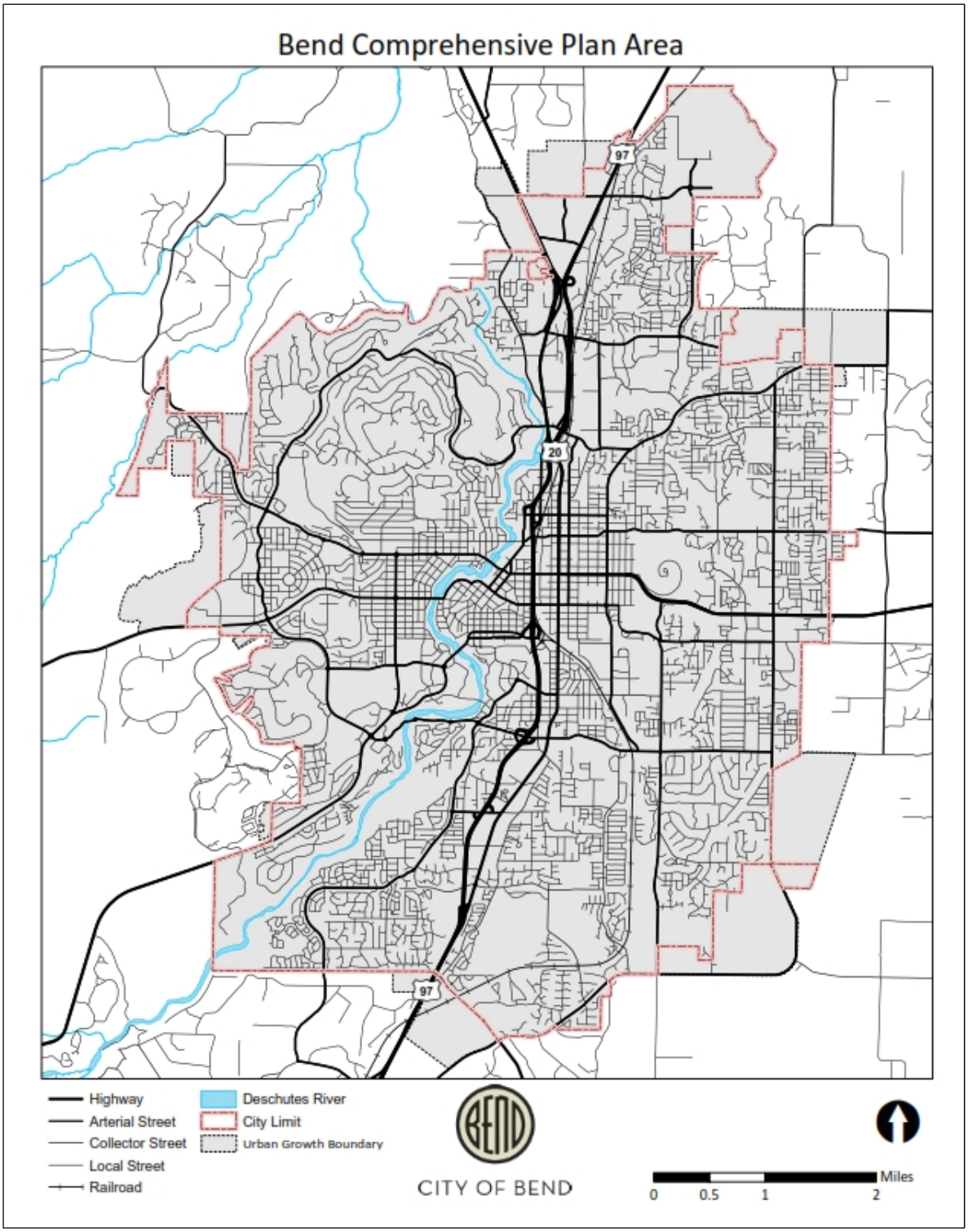


Figure 1-1
Bend Urban Planning Area

Management Agreement
In 1978 the city and county entered into an agreement for the Joint Management of the Bend Urban Area. This agreement sets up formal procedures to implement the Urban Growth Boundary and the Bend Comprehensive Plan consistent with state planning laws. A new management agreement was approved in 1998 that provides for the city to administer all planning and building codes within the Urban Growth Boundary.

This joint management agreement also sets forth responsibilities and procedures for changing the Comprehensive Plan, providing urban services, having consistent development codes and standards, and for reviewing and commenting on land use applications. It is reviewed and amended from time to time to reflect management changes within the urban area. The provisions of the Joint Management Agreement will be revisited with the adoption of the new urban growth boundary. The agreement is on file at the city and county planning offices.

Citizen Involvement

The city and county use a variety of techniques and forums to gather ideas from the citizens of the community, to explain planning concepts in the Comprehensive Plan, and to evaluate public comments. The major citizen involvement activities used during the development of this updated Plan are described in the *Preface* to the Comprehensive Plan.

A permanent and on-going forum for citizen involvement is the Bend Planning Commission. The Bend Planning Commission was established in 1980 by the city and the county. Its role is to carry out a comprehensive planning program, using citizen comments and public hearings when appropriate. The Planning Commission is the official Citizens' Involvement Committee for the urban area, and advises the elected bodies on land use planning programs and policy. In addition to the Planning Commission, there are other citizens' committees that have particular areas of interest that relate to land use and transportation planning:

- Deschutes County Bicycle and Pedestrian Committe
- Bend Traffic Safety Committee

The interest in community and neighborhood involvement is so strong in Bend that several major private developers have used public forums, workshops, and citizens committees to help them design projects that are consistent with the Bend Area Comprehensive Plan.

Policies

General Policy Guidance

1-1 The Goals stated within this Comprehensive Plan are intended to be guiding and aspirational; they are not regulatory policies. The Policies in the Comprehensive Plan are intended to provide standards for the City in adopting land use regulations, and compliance with the implementing

regulations shall be deemed in compliance with the Comprehensive Plan.

1-2 Comprehensive Plan designations may be rearranged on a development site through the Type III Master Plan process in a way that will best meet individual development priorities while maintaining the same overall acreage of each designation and compliance with the Comprehensive Plan policies

Urban Planning Coordination

1-3 Growth in the Bend Area shall be managed through the cooperative efforts of the City of Bend and Deschutes County.

1-4 The City and special districts shall work toward the most efficient and economical method for providing their services within the UGB.

1-5 No new water or sewer service districts shall be created within the UGB without the concurrence of the city.

Development within the Urban Growth Boundary

1-6 New developments shall pay to extend planned sewer, water, and transportation facilities to and through the property if the development occurs prior to the scheduled construction of those facilities shown in the capital improvement plan.

1-7 The City will encourage compact development and the integration of land uses within the Urban Growth Boundary to reduce trips, vehicle miles traveled, and facilitate non-automobile travel.

1-8 The City and county will encourage infill and redevelopment of appropriate areas within Bend Central Core, opportunity Areas and transit corridors (see Figure 11-1).

Refinement Plans (see definition in Glossary and related policies in Chapter 5)

1-9 The City may prepare land use refinement plans for neighborhoods or other discrete geographic areas.

1-10 The area to be included in a refinement plan study shall be approved by the City Council, and the boundary of a study area shall be shown on the zoning map until the study is complete.

1-11 A refinement plan, including detailed maps, policies, and text, when adopted by the city, shall become part of the Zoning Ordinance.

1-12 Refinement plans shall, at a minimum, provide plans for the

development of sanitary sewer, water, and transportation systems and criteria by which to evaluate proposed amendments to an adopted refinement plan.

1-13 Refinement plans may evaluate the need for, and designate the location of, schools and park facilities, public and private open space, future neighborhood commercial or convenience commercial uses, residential, and mixed use areas.

1-14 Refinement plans may include site and building design regulations and alternative street standards.

Citizen Involvement

1-15 The City shall continue to use advisory committees in their planning process, members of which are selected by an open process, and who are widely representative of the community.

1-16 The City will use other mechanisms, such as, but not limited to, meetings with neighborhood groups, planning commission hearings, design workshops, and public forums, to provide an opportunity for all the citizens of the area to participate in the planning process.

Chapter 2: Natural Features and Open Space

Adopted Amendments

EFFECTIVE DATE	ORD #	CHANGES
November 18, 1998	Resolution #2247	Comprehensive Plan Update
2016	NS-2271	Format update, minor text changes to remove outdated text

BACKGROUND

Context

Open space and natural features are an integral part of the Bend Urban Area plan. A wide range of types and sizes of open space and natural features within the urban area should provide: diverse plant and animal habitat, visual and spatial breaks from urban uses, places for recreation and sports activities, facilities for community events, trails for pedestrian and bicycle transportation and recreation, and many other uses. As defined in the plan, open space and natural features may be in the form of: parks, public school grounds, trails, natural areas and areas of special interest, river and stream corridors, open space easements and right-of-way, and lands excluded from development. The preservation and enhancement of open space and natural features, and their incorporation into the infrastructure of the Bend Urban Area is a function of the plan and related ordinances.

Bend is in the center of some of Central Oregon's most exquisite natural resources. The Deschutes National Forest to the west offers easy access for multiple recreational activities, and provides the backdrop of mountain peaks captured in thousands of photos of Bend. To the east of the urban area, there are thousands of acres of juniper and sagebrush lands. These lands form the edge of the Great Basin, and offer a different type of open space.

The interaction of land, water, plants, and wildlife through the millennia created a place that attracted—and still attracts— people because of its beauty and natural features. Bend is a community that values the area's natural features and has tried to incorporate natural features in the design of the built environment. Volcanic rock has been incorporated into hundreds of retaining walls, foundations, porches, steps, chimneys, and even in the main walls of homes and businesses. Public parks and trails follow the river through town. Mature pine and juniper trees have been preserved in developments, in parks, and in the design of sidewalks and streets.

Maintaining the natural features and open space in an urban area is a difficult task, and one that becomes more complex during periods of rapid population growth. However, providing open space in the urban area for the benefit of existing and future residents is important. To help ensure Bend's livability, the following additional goals should be implemented to provide long-term protection of open space and natural features:

- to preserve interesting and distinct geologic formations and areas of natural vegetation;
- to provide land for recreational uses such as hiking, photography, bicycling, jogging, or fishing;
- to preserve water resources, riparian areas, and wildlife habitats;
- to establish a system of trails, greenways and wildlife corridors that are interconnected;
- to shape the urban development and provide visual relief from developed land;
- to soften the appearance of street corridors with planter and median strips;
- to encourage environmental awareness so that citizens will become stewards of our natural areas; and
- to support the coordinated efforts of public agencies, private organizations and individuals to preserve and enhance the area's natural features and open space.

The Bend Comprehensive Plan and implementing codes support management practices to

preserve, maintain, and create natural features, open space, and Areas of Special Interest. The Preamble, the goal statements, and several Plan policies in this chapter speak to the importance of preserving and managing natural features. The city and county zoning codes also regulate development within the Deschutes River Corridor to protect the riparian areas and river rimrocks. Site plan reviews provide the opportunity to preserve natural areas through building setbacks, conservation easements, and other measures.

Overview

This chapter describes the many types of open space and natural features that add to the quality of life for our residents. Public park land and natural areas, an important component of Bend's quality of life, are mentioned briefly in this chapter as a type of open space. The public parks and recreation programs in the urban area are described in more detail in Chapter 3, *Community Connections*. Other related topics that also contribute to our quality of life are covered in the Chapter 9, *Community Appearance* and Chapter 10, *Natural Forces*.

That the settlement of Bend is here at all is a result of dynamic natural forces that shaped the landscape. The lava flows and volcanic ash, in place before the elk and cougar roamed the area, form the canyon walls and punctuate the urban area with rock outcroppings, ridges, and cinder cones. The Deschutes River, and smaller streams that have long since disappeared, cut through the lava and ash, and brought life to the land. Animal and plant species that adapted to the dry summers and snowy winters of Central Oregon over hundreds of thousands of years still grace the urban area today.

A city is the sum of physical, biological, and historical processes that shape the social values and image of the community. The natural features such as the rock outcroppings, native vegetation, the river, and wildlife frame Bend's special character and sense of place. Which natural features have some intrinsic value, and how much land should be preserved, are questions that Bend area residents wrestle with as they seek to balance the value of growth and the value of preserving natural areas.

As regional and national developers "discover" Bend they seek to bring their national look to the urban area. The city and county will need to be stronger in reflecting the community's desire to incorporate natural features and native materials into commercial and residential development.

Open Space

The irregular terrain and native vegetation in Bend give the area a distinctive visual character and quality. These features limit views within the community, thereby creating a sense of a smaller urban area. Land in all parts of the urban area that has been vacant for decades is being developed. This development is changing the feel of the community from a rural town to an urban city. The expansion of development may reduce or change the open space and natural features that "break-up" the appearance of the man-made environment.

Open space is clearly a broad term that can apply to many types of undeveloped and improved land. Table 2-1 describes six types of "open space" that exist to a greater or lesser degree within the urban area.

Table 2-1 Types of Open Space

Table	Purpose	Examples	How to provide/conserve
Natural areas	• retain or restore natural landscape and vegetation • provide wildlife habitat	▪ undeveloped park or public land ▪ landscape areas left in natural state ▪ PUD common areas ▪ subdivision common areas	o PUD development o flexible subdivision standards o commercial landscape standards o private or public land trust
Large developed	• active or passive recreation • places for gatherings	▪ community and neighborhood parks, ▪ school grounds, ▪ PUD common areas, ▪ golf courses	o property tax revenues o user fees / SDCs o PUD requirements o private investment
Small developed	• areas for quiet enjoyment • relaxation or resting spot • visual break	▪ 'pocket parks', ▪ excess right-of-way, ▪ planter in middle of cul-de-sac bulb, ▪ subdivision entrance, ▪ commercial plaza, ▪ grounds around public utility facilities	o require during development o property owners association o flexible subdivision standards o property tax measures o sensitive design and construction
Corridor or linear	• visual break • community appearance • design rhythm • pedestrian amenity • wildlife corridor	▪ irrigation canals ▪ developed trails ▪ river canyon ▪ pedestrian walkways ▪ street planter strip and median strip	o easements or dedications o setback regulations o transportation corridor designs o property tax revenues
Perimeter	• physical or visual break between uses • passive recreation • wildlife habitat / corridor	▪ forest and BLM lands, ▪ regional park land ▪ subdivision buffer to protect wildlife	o public acquisition or ownership o developer design o conservation easement
Private spaces	• passive or active recreation • relaxation and resting • wildlife habitat	▪ house or multi-family yards ▪ private recreation facilities	o private ownership o association dues o land trust purchase

The list below is from the city's inventory of open space lands held by both public and private parties. This list was recently updated to reflect more current land holdings. The inventory is based on tax parcel ownership, and therefore provides only a rough estimate since some trail corridors, PUD common areas, irrigation District easements, and golf course properties may not have distinct tax parcel numbers.

Public park and recreational facilities	605	acres
City, county and other public properties	1,321	acres
School district holdings	524	acres
Private open space and recreational sites	1,537	acres
Irrigation Districts	178	acres
Total Acres	4,166	acres

Although this number gives a rough estimate of total acreage, it does not describe the size, type, or land use that is currently considered as "open space." The city and county will continue to monitor the creation and conversion of open space in the urban area, and evaluate or modify as necessary the open space designations on the Plan map. The types and amount of open space will be reviewed in future updates of the Plan.

"Areas of Special Interest" and Natural Features

One of the common desires mentioned by residents through more than 20 years of community planning has been to retain and conserve the natural character of Bend as the community grows and changes. Although it is difficult to precisely define what "the natural character" means to people, it can be considered a composite of features typical to Bend: ancient volcanic rock outcroppings, large ponderosa pines and junipers, the Deschutes River, improved public and private open space, and a relative abundance of wildlife and waterfowl.

"Areas of Special Interest" are designated on the Land Use Map because they have features typical of Central Oregon, or represent important wildlife areas. The most significant are the River Corridor Areas of Special Interest along the Deschutes River, which includes the river canyons and rimrocks in the north and south portions of the urban area. At the south edge of the urban area the River Corridor Area of Special Interest includes wildlife habitat areas along the river canyon and a cinder cone. The smaller, scattered Areas of Special Interest on the Plan Map are the more prominent rock outcrops and rock ridges in the urban area. They are not specifically inventoried with respect to size, quality, or importance. These high points break the line of sight so that the area retains a feeling of undeveloped open space. Because these

Areas of Special Interest are small and the scale of the Plan Map is large, the indication on the Map represents the approximate location of the area. More detailed contour maps have been developed and the sites inventoried to determine the specific boundaries of the Areas of Special Interest.

Keeping these features relatively intact will help retain the natural character of Central Oregon as the community grows. The Areas of Special Interest and other natural areas can be retained as either public or private open space. Some sites within the urban area are already protected because they are owned and managed by public agencies.

The city has changed its codes to provide incentives or encourage developers to preserve natural features. Such code changes shall include, but are not limited to, the following:

- A new “cluster housing” subdivision option specifically aimed at preserving natural features;
- Flexible minimum residential density standards on sensitive lands to protect natural features.
- Provide density credit equivalent to the area being preserved;
- Flexible setbacks, lot coverage, and parking standards for site development;
- Opportunities for tax benefit in accordance with the provisions of the Deschutes County Tax Assessor;

Local governments and special districts can also preserve or conserve natural areas through several non-regulatory measures. They can:

- seek donations or gifts of land from private parties;
- request transfer of land from federal agencies or other governmental organizations;
- purchase land using revenue from bonds, system development charges, or other fees;
- obtain conservation easements along the river or other sensitive areas to protect wildlife habitat;
- include natural features and open space in the design of reservoirs, pump stations, and other such utility facilities; and
- locate transportation and utility systems to avoid natural features and Areas of Special Interest.

Natural areas can also be retained in private ownership in a variety of ways without adversely affecting the density or development potential of a site. The city and county encourage the private sector to preserve natural areas within subdivisions and other developments. Many local developers have accommodated the goal of conserving natural features by incorporating rock outcroppings, mature trees and native vegetation and related features into their projects by:

- including them within common areas in Planned Unit Developments or subdivisions;
- including them within the undeveloped street right-of-way;
- adjusting lot lines and street patterns to leave them in the non-buildable setback areas; and
- making them part of the required landscape area in commercial, industrial, and multi-family projects.

Deschutes River Corridor

The Deschutes River is a thread that weaves the fabric of the community together. It runs for eight miles through the middle of the urban area, and flows past industrial, commercial, mixed-use, parks, and all categories of residential lands.

The river has served many needs of the community, and in doing so, has become a common reference for the citizens. The Deschutes River was used to transport and store logs for the two sawmills south of downtown. It is a source of water for agricultural lands and power for homes. It has been the setting for recreation, community festivals, and entertainment for decades. With stretches of both fast-moving and still waters, the Deschutes River provides food and home for wildlife, and a respite for humans from the pressures of work and life.

The importance of the river is underscored by state and local actions. In 1983 Deschutes County and Bend established a moratorium on hydroelectric facilities and created the Deschutes Basin Task Force committee to study the natural resources of the Deschutes River and its tributaries. The reports and other studies produced by this task force are background documents for this Plan, and the work from this committee influenced the development of rules to protect the river resources. Policy recommendations from the Task Force are included in a separate section of policies in this chapter and also included in the Deschutes County Comprehensive Plan.

In 1988 a statewide voters' initiative added several miles of the Deschutes River to the state's scenic waterway program, including about two and one-half miles within the urban area. The area from the south urban growth boundary line to the Central Oregon Irrigation district diversion is classified as the *South Bend River Community Area* in the state's scenic waterway program. At the other end of the urban area, the stretch of river from the south edge of Sawyer Park to the north urban growth boundary is classified as the *North Bend River Community Area*. Both scenic waterway areas are considered significant "Goal 5" resources under Oregon's land use planning program. The Oregon Parks and Recreation Department has the authority to review and approve any development along these scenic waterway segments. In addition to the river segments protected by the State, the City recognizes the significance of the north and south river canyons for their beauty and recreational opportunities. Both the north and south river canyons have been included in the City's inventory as a "goal 5" scenic resource.

In the early 1990s the city and county adopted special Deschutes River Corridor development standards to recognize and respect the unusual natural beauty and

character of the Deschutes River. The city has also adopted a Mixed-use Riverfront zone that allows for the redevelopment of land along the river previously used by sawmills. This zoning district is designed to enhance the natural character of the river and to encourage access to and the enjoyment of the river corridor.

Wetlands and Riparian Areas

Wetlands and riparian areas have a variety of native plant species that are adapted to growing in locations where the soils are wet during all or part of the year. Well established wetlands and riparian areas provide a complex ecosystem that support a diverse combination of plants and animals.

It is important to conserve and improve the wetlands and riparian areas along the Deschutes River and Tumalo Creek in Bend. These areas serve several functions that protect and enhance the quality of both animal and human life within the urban area in many ways. Wetlands and riparian areas:

- Reduce stream velocities that can erode or damage stream banks and property.
- Provide storage for water during peak flows and flooding conditions.
- Trap or filter sediment and runoff water from upland areas and impervious surfaces.
- Provide shade over the river that helps water quality by reducing the warm water temperatures that produce algal blooms.
- Provide shade to help moderate water temperature to support fish and other aquatic animals.
- Provide vegetation and woody debris that serve as habitat and nesting areas for a variety of aquatic animals, birds, and mammals.
- Provide a safe corridor for birds, amphibians, and mammals that live and feed along the river.
- Provide a transition area between aquatic and upland habitat areas during animal migration.

Wetlands within Bend were inventoried and evaluated in the summer of 2000 as part of the preparation of a Local Wetland Inventory, a required Periodic Review update of the Comprehensive Plan. The photo below is an example of the significant and non-significant wetlands mapped during this Local Wetland Inventory process. Table 2-2 lists the significant wetlands. All of the significant wetland sites are along the Deschutes River.
Bend's Local Wetland Inventory replaces the older National Wetlands Inventory map for the urban area.

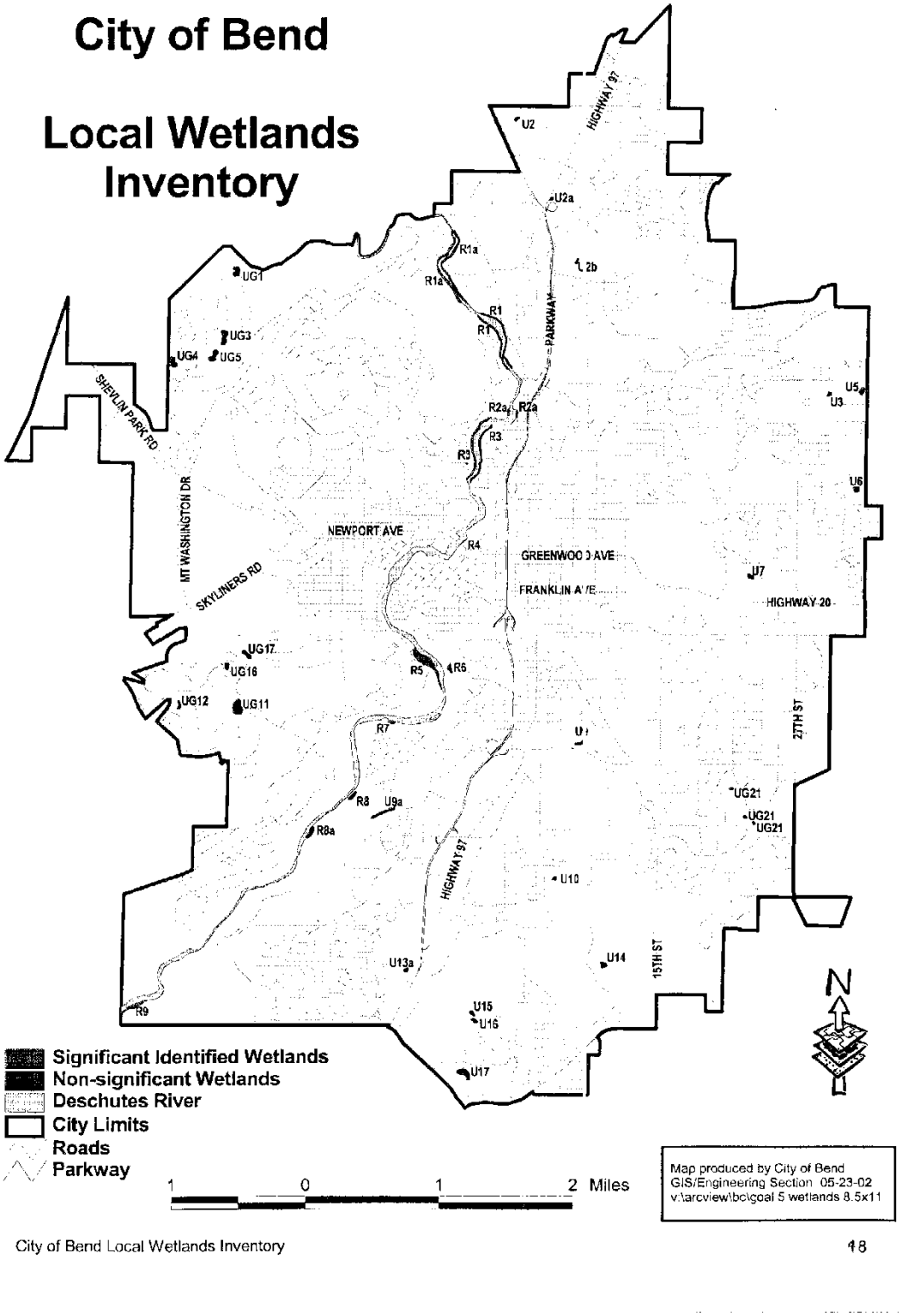
In 2000, the riparian areas within Bend were also inventoried and evaluated. The

riparian area along the Deschutes River and Tumalo Creek are considered significant resources under Statewide Planning Goal 5. Conflicting uses within the riparian corridor are primarily existing and future residential development, new park development, commercial development and other uses such as roads, trails, and docks.

Any development within the bed of the Deschutes River or Tumalo Creek, or within the riparian corridor, including the removal or enhancement of riparian vegetation, must meet standards in the city's land division and zoning codes. In addition to local code requirements, the Oregon Division of State Lands and Oregon Department of Fish and Wildlife have responsibility to review and approve developments within wetlands and the Deschutes River.

Table 2-2 Significant Wetlands in Bend

Inventory Field Code	General Location of Wetland
R9	At south edge of UGB on east side of river. Land area about 2.5 acres
R8a	Upstream from COI hydroelectric plant. Land area about 1.5 acres.
R8	Downstream from COI hydroelectric plant. Land area about 1 acre
R7	Downstream from old log deck footbridge, east side. Land area less than 1 acre.
R5	Upstream from Colorado Ave. bridge on west side. Land area about 6.5 acres.
R4	Downstream below Newport Bridge on east side. Land area about 1 acre.
R3	Both sides of river below 1st Street rapids along the River Run trail and below cliffs. Land area about 5 acres.
R2a	Just upstream from North Unit dam. Land area about 2.5 acres.
R1	Between Riverhouse motel to Sawyer Park. Land area about 5 acres.
R1a	Series of small wetlands from Sawyer Park to RimRock Village footbridge. Land area about 3 acres.



City of Bend Local Wetlands Inventory

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Fish and Wildlife

There are several key wildlife areas in Bend. The most important, and most diverse, wildlife area is the riparian corridor and canyon walls along the Deschutes River. The combination of still waters, rapids, the many species of shrubs, bushes, and trees, and the rock outcroppings provide a variety of important habitats and food sources. Wildlife species that inhabit the Deschutes River corridor include: deer, elk, cougar, otter, beaver, mink, raccoon, osprey, red-tailed hawk, bald eagle, kingfisher, trout, whitefish, and several species of reptiles, amphibians, and waterfowl. Although there are many species that occupy the river corridor, the Oregon Department of Fish and Wildlife has determined that there are no significant wildlife habitat areas or nesting sites within the urban area that require special land use protection. Even though there are no "significant" wildlife resource areas, because of its value to wildlife and its related benefit to area residents, the river canyon corridors in the south and north parts of the urban area identified as an Area of Special Interest in the Comprehensive Plan and shown on the Plan Land Use Map.

At the west edge of the urban area is Tumalo Creek, a second important riparian and wildlife area. The Bend Metro Park and Recreation District manages about 600 acres along the creek for passive recreation such as hiking and picnicking, and has designated its property as a wildlife refuge.

Most of the area along Tumalo Creek is in a more natural condition than the urban portion of the Deschutes River. Because of that, the Tumalo Creek area is a more diverse and complex habitat than the Deschutes River corridor, and supports larger wildlife such as coyote and cougar. The Oregon Department of Fish and Wildlife has not identified any significant habitat areas or nesting sites within the city portion of Tumalo Creek that warrant special protection measures.

West of the urban area in the Urban Reserve and adjacent forest lands there are areas where deer and elk herds feed during the winter when they move down to lower elevations out of the deep snow.

The winter range is mainly north of the river, but herds may also move across the river into the southwestern portion of the urban area. The Oregon Department of Fish and Wildlife has designated and mapped elk habitat and deer winter range areas, but these designations do not extend into the urban area. Lands within the UGB are not critical to managing the elk herds and maintaining healthy herd populations.

In addition to these two areas, there are many smaller, more separate enclaves of natural features and native vegetation that the community seeks to conserve within developments. Several species of squirrels and chipmunks, lizards, snakes, quail, and many other bird species all find food and shelter in small natural areas and even in patches of natural habitat common to many residential yards.

Besides being beneficial to the wildlife, these habitat areas also provide opportunities for residents and visitors to observe and enjoy the interaction of natural plant, animal,

and aquatic communities within our urban area.

Policies

Natural Features and Open Space

2-1 The city will inventory and maintain a list of natural features and open space lands that are important to the community.

2-2 The city and Bend Metro Park and Recreation District shall share the responsibility to inventory, purchase, and manage public open space, and shall be supported in its efforts by the city and county.

2-3 During January of each "odd numbered" calendar year, individuals may apply to the City for new ASI designations to be added to the Comprehensive Plan and the zoning maps. During the same period of time, the City shall review city owned properties for potential new ASI designations.

2-4 Detailed maps of the Areas of Special Interest shall provide guidance to property owners and staff in interpreting the ASI boundary location.

2-5 The City shall review proposed developments that include Areas of Special Interest and natural features identified on the Plan Map to ensure they follow the policies of this Plan.

2-6 Major rock outcrops, stands of trees, or other prominent natural features identified in the Comprehensive Plan shall be preserved as a means of retaining the visual character and quality of the community.

2-7 Natural tree cover should be retained along streets in new developments to retain the natural character of Central Oregon within the urban area as the community grows.

2-8 All residential development should respect the natural ground cover of the area, and the city shall work with developers to preserve mature trees within the subdivision.

2-9 The City shall develop standards to conserve mature native trees and standards that describe the types of trees for commercial and industrial developments that are compatible with Central Oregon's climate.

2-10 The City shall participate with other governments, special districts, non-profit organizations, land trusts, interested businesses, and citizens in protecting open space.

2-11 The City shall develop flexible subdivision and development standards that make it easier for developers to provide open space within a neighborhood.

2-12 The City shall evaluate and adopt standards for the types of landscape materials and amount of open area buffers around structures that reduce the risk of loss from wildfires at the edge of the urban area.

2-13 The City shall have the primary responsibility for providing opportunities for the creation and management of private open space areas.

2-14 The City will consider how best to protect important native fauna and flora within the Bend urban area, as identified by the open space and natural features inventory.

Deschutes River Corridor

2-15 The City shall seek opportunities to retain the banks and canyon of the Deschutes River as public or private open space throughout its entire length within the planning area.

2-16 Within the Areas of Special Interest designated on the Plan Map, the city and county may allow developments that carry out the intent of the Plan to enhance the variety and livability of the Bend Urban Area, and provided that such developments:

- are not subject to natural hazards;
- would not inflict irreversible harm to the riparian zone;
- would enhance public open space, parks and access;
- are designed to be compatible with natural features; and
- provide access to the river or a trail along the river corridor to the extent allowed by law.

2-17 The City shall prepare development regulations to further reduce visual and ecological impacts of development along Tumalo Creek and the Deschutes River.

2-18 The City shall request that the ODFW develop a list of trees and vegetation appropriate for planting along the Deschutes River. The list shall be used during design review of proposed riverfront development when landscaping or screening issues are considered.

Fish and Wildlife

2-19 The City shall ensure through conditions of approval that development in the Urban Reserve Area adjacent to or within one

mile of lands designated by the County's wildlife overlay zone incorporate setbacks or buffers to protect designated wildlife areas.

2-20 All trout spawning areas shall be considered significant habitat and shall be protected.

2-21 The City shall promote and support educational programs on riparian natural history, river maintenance and courtesies, impacts of habitat alteration, and habitat disturbance by domestic animals and human activities.

2-22 The City shall request that the USFS and ODFW adopt a winter elk management plan for the Benham Falls elk herd. Emphasis should be given to identification of their sensitive habitat in order to minimize potential conflict with development and recreational activities.

2-23 If significant Goal 5 wildlife habitat areas or nesting sites are documented during future Periodic Review inventory work the City will adopt new protection measures if existing codes are not adequate to protect the resource.

Wetlands and Riparian Areas

2-24 The City's Local Wetland Inventory map and list in the Comprehensive Plan replaces the National Wetlands Inventory map for the area within the Urban Growth Boundary.

2-25 Wetland areas that are significant Goal 5 resources to be protected through the city's riparian corridor standards are those areas listed and mapped in the Comprehensive Plan.

Deschutes Basin Study Policies

The following policies were developed by the city, county, and a citizens committee in the late 1980s in response to a number of issues that could impact the Deschutes River. Most of the policies deal with issues of regional or statewide significance, and are therefore beyond the scope of the Bend Area Comprehensive Plan.

1. The City and county shall establish a water conservation committee including, but not limited to, local representatives from the irrigation districts, Department of Water Resources, Department of Fish and Wildlife (ODFW), United States Forest Service (USFS), Deschutes County and the City of Bend Planning Department, and Deschutes County and Bend Planning Commissions to provide an ongoing forum regarding water management on the Deschutes River and its tributaries and to make recommendations to appropriate agencies. The committee should:

    i. Request assistance through Bonneville Power Administration's (BPA) technical assistance program for technical improvements in methods of irrigation and means of conservation of both water

and energy.

ii. Request assistance from the Water Resources Department, Bureau of Reclamation, and Soil and Conservation Districts to initiate an in-depth study of, and to set priorities for, actions that should be taken to improve the irrigation districts' delivery systems.

iii. Assist the county and City in the implementation of the goals and policies of this section.

2. The City and county shall petition the Water Resources Department to amend the appropriate provisions in the Deschutes River Basin Plan to reflect the recommendations of the River Study Task Force.

3. The City and county shall petition the State Legislature to amend state law to designate in- stream use as a beneficial use to ensure that rights designated to in-stream use shall not be subject to downstream appropriation by holders of equal or junior rights, and petition the Water Resources Department to adopt a uniform, easily-accomplished process for the transfer of water rights in the Deschutes River Basin to in-stream use.

4. The City and county shall petition the Bureau of Reclamation to conduct a feasibility study on the Manner Reservoir site, including (a) the non-irrigation flow required for filing, (b) to what extent gravity feed irrigation would be possible, and (c) to what extent low flows below Wickiup Dam could be augmented during the non-irrigation season.

5. The City and county shall petition the Bureau of Reclamation, USFS, United States Geological Survey (USGS), and the Oregon Department of Environmental Quality (DEQ), to establish a bedload of sediment monitoring program and to determine an appropriate maximum discharge from Wickiup Dam, which program addresses the effects of bank erosion on rehabilitation of spawning habitat, riverfront property, recreation and scenic values, and accomplishes the determination of flow regime through interagency cooperation with the affected irrigation districts.

6. The City and county shall petition the Bureau of Reclamation to determine what the consequences would be to irrigation districts, recreation use, and the stabilizing of water releases below Wickiup Dam by maintaining a lower level of water in Crane Prairie Reservoir, and diking off known high loss areas within the reservoir to minimize excess seepage.

7. The City and county shall encourage the Water Resources Department, irrigation districts, and municipalities utilizing diverted waters to enforce the "without waste" provision in appropriated water rights.

8. The City and county shall support efforts by the irrigation districts to provide financial incentives to conserve water. This incentive could be determined for example, by a water use fee on the minimum amount of water required (commensurate with the plant/soil requirements determined by the soil and

water conservation districts) and an excess charge for water used over the base amount.

9. The city and county shall support efforts by the irrigation districts within the upper and middle Deschutes River Basin to allow expansion of irrigated land within a district's boundaries, as part of a means to share conserved water, for those districts that implement water conservation and in-stream flow enhancement programs.

10. The City and county shall encourage examination by irrigation districts and the Water Resources Department of options for providing additional flows below the North Canal Dam during the irrigation season. These additional flows shall not take the place of the current 30 CFS spilled by agreement with Central Oregon Irrigation District (COID), and North Unit Irrigation District (NUID). Options that might be considered include shared conserved water, public participation in irrigation district improvements, public "buy down" of interest rates on improvement loans, and public or private purchase/transfer of water rights for in-stream use.

11. The City and county shall continue to replace the Tumalo water supply pipeline. When this pipeline is complete, gates should be installed at the intake, which would help stabilize withdrawals from Tumalo Creek.

12. The City and county and Tumalo Irrigation District shall explore options to improve in-stream flows and fish habitat in Tumalo Creek. Tumalo Irrigation District should consider apportioning their water draws to maximize the use of the Tumalo Feed Canal rather than the Columbia Southern Canal. This action should increase water flows through Shevlin Park and minimize the excessive water losses that now occur in the Columbia Southern Canal.

13. The City and county shall continue to strongly support and promote the conservation of all forms of energy resources through cooperation with the Northwest Power Planning Council, Bonneville Power Administration programs, recycling, solar ordinances, energy-efficient building standards, and appropriate geothermal resources.

14. Hydroelectric projects that are not physically connected to an existing dam, diversion, or conduit are prohibited.

15. The City and county shall develop a program to assure that hydroelectric projects located within existing man-made transmission systems and using existing flow regimes, or physically connected to an existing dam, diversion, or conduit, but not using existing flow regimes, are subject to the following provisions:

    i. Are consistent with federal and state law.

    ii. Hydroelectric projects shall not increase the maximum surface area of an impoundment behind an existing dam or diversion.

    iii. Hydroelectric projects shall not be located in significant/sensitive

fish or wildlife areas unless it can be demonstrated that the project, if constructed, would restore significant/sensitive fish or wildlife habitat in the reach affected by the project.

iv. Hydroelectric projects shall stabilize stream flows, restore degraded trout habitat, and provide public access to as great an extent as practical.

v. Hydroelectric projects shall avoid adverse impacts if possible. Where not practicable, impacts shall be minimized, while providing for restoration of already adversely impacted areas along the river or stream. Restoration does not necessarily have to be in the immediate project vicinity.

vi. Hydroelectric projects shall have no adverse impact to water-related and water- dependent recreation unless it can be shown that existing water-related and water- dependent recreation of the same type, quality, and quantity as that which may be lost can be restored or enhanced in the project vicinity. Recreational activities include those activities that occur now and which may reasonably be expected to occur in the future.

vii. Hydroelectric projects shall include a river restoration plan documenting both on-site and off-site restoration and enhancement strategies consistent with adopted goals and policies. The plan shall identify costs, time schedules, and coordination actions with all affected parties. The plan shall address, but not be limited to stabilizing water flows, trout habitat restoration, and public access. No hydroelectric project shall be permitted until the plan has been approved through the public review process.

viii. Hydroelectric projects shall post a performance and restoration bond to ensure implementation of the approved restoration plan.

ix. Hydroelectric projects shall be consistent with the provision of the Columbia River Fish and Wildlife Program and the Northwest Power Plan as adopted by the Northwest Power Planning Council.

16. The City and county shall recommend to the State Transportation Commission that the Deschutes River from below Wickiup Dam downstream to the first COI diversion, and from Sawyer Park north to the county line be included in the State and Federal Scenic Waterways Programs.

17. The City and county shall support the designation of appropriate segments of Fall River, Little Deschutes River, and Crooked River as state and/or federal scenic waterways.

18. Support the creation of a nonprofit, private organization that would take a complementary role in the acquisition of property to further the goals of preserving areas for the scenic, recreational, fish and wildlife values.

19. Buildings near the riverfront district should not constitute a physical barrier

between the core and the river.

20. The City and county may require public access for any land use action adjacent to the Deschutes River and Tumalo Creek. Access may be limited to foot traffic only; other non-motorized traffic may be negotiated by the city or county.

21. The City and county shall include in all public access easement provisions addressing safety, security, vandalism, litter and any other maintenance concerns expressed by the landowner. The cooperation of the State Police and County Marine Patrol should be sought in working with these landowners and in maintaining the easement agreement.

22. The City and county may accept by donation, fee title ownership for any riparian land for which public access is being required. If the city or county refuses to accept ownership, any required public access shall be waived.

23. The City or county may grant exceptions to the public access requirement where access would be near the nest sites of protected or sensitive wildlife species. In such cases, the city or county shall instead require a conservation easement to protect the nest sites from harassment and disturbance, using the assistance of the USFS, ODFW, and citizens knowledgeable of the nesting requirements of these species prior to drafting the easement.

24. The City and county shall request the Legislature to allow the County Assessors to recognize these public access easements in their assessment policies.

25. The visual impact of excavations or structures that will be erected or substantially modified along the rimrocks bordering the Deschutes River or Tumalo Creek shall be minimized.

26. Citizens groups, business associations, and private foundations and organizations should be involved in developing and implementing a greenway plan along the Deschutes River and Tumalo Creek.

27. The City and county shall support a riverfront development plan in conjunction with a county- wide greenway project.

Chapter 3: Community Connections

Adopted Amendments

EFFECTIVE DATE	ORD #	CHANGES
November 18, 1998	Resolution #2247	Comprehensive Plan update
October 4, 2006	NS-2025	Text amendment to remove "Mill A" from inventory of historic sites
July 15, 2009	NS-2123	Text amendment to add Nels and Lillian Andersen House to Table 3-1
June 17, 2015	NS-2243	Text amendment to remove Brooks Scanlon Craneshed building from the inventory of historic sites.
2016	NS-2271	Format update, minor text changes to remove outdated text

BACKGROUND

Context

Within the Bend Urban Area are many public agencies and private organizations that impact the governmental, educational, recreational, social and cultural aspects of our community. These agencies include state, county and city governments, Bend-La Pine School District and Bend Metro Park and Recreation District, social service and cultural agencies, historical preservation and art organizations, and others. The Comprehensive Plan and related ordinances shall consider the interconnection among these agencies and organizations and their missions.

The topics in this chapter deal with history, culture, parks and recreation, and public education. Some of these topics are affected by forces that are outside the bounds of local land use planning. For example, there may be state rules that override local policies, and community cultural programs often change with the citizens' interests and support. For that reason, the goals below provide direction only for those topics that may be affected by land use planning:

- to encourage the preservation of historic and cultural resources within the urban area;
- to foster a sense of historic awareness among the citizens of the community;
- to expand the number and variety of cultural and artistic venues held downtown and elsewhere in the community;
- to provide quality green spaces, natural areas, and recreation sites through public and private park land throughout the community; and
- to coordinate the development of future park and school sites to serve the expanding urban area population.

Overview

Planning for a community is more than measuring the number of dwellings, the variety of jobs, or the miles of roads. The topics in this chapter describe other less tangible, but equally important, conditions that will shape the future of Bend.

Primarily, the topics in this chapter affect the quality of life at a more personal rather than economic level for Bend urban area residents. However, the quality of our schools, parks, and cultural activities bolster the economic well-being of our community. The discussion below, and the policies at the end of this chapter, show how these topics fit into the comprehensive planning for Bend's future.

Historical Features

Bend has a relatively short modern history, but a much longer Native American history, going back thousands of years, as evidenced by the archaeological resources found along the river.

While most archaeological resources have likely been destroyed within the urban area, there are a significant number of sites around the city that have been identified.

United States government scouts, such as John C. Fremont, and government survey teams explored Central Oregon in the 1840s and 1850s, but it was not until the 1870s that the first permanent settlement was established in the area. By 1877 a land claim was filed for the "Farewell Bend" ranch, located at the dramatic 90 degree bend in the Deschutes River just south of what is now downtown. A post office for the Farewell Bend settlement was applied for in 1886, and granted that year under the name of Bend.

In its earliest days, Bend was a small trade center for the agricultural and ranching operations to the east and north. Shortly after the turn of the century, East Coast developers formed the first irrigation companies in the area, and construction was begun on several large canals and dams needed to take water out of the Deschutes River to irrigate the high, dry desert. The main canals are still in operation today, and snake through Bend as they carry water to agricultural lands as far away as Madras, 40 miles to the north.

The City of Bend was incorporated in 1905, with a population of about 500 persons. In the next decade, two events changed the direction of Bend for the next half century. In 1911 the Oregon Trunk Line Railroad coming south from the Columbia River was completed to Bend. The railroad created a new lifeline to move people and products in and out of Central Oregon. Four years later, two large Minnesota lumber companies, the Shevlin-Hixon company and the Brooks-Scanlon company, announced plans to build large sawmills on each side of the Farewell Bend stretch of river.

Figure 3-1. Shevlin-Hixon mill on east side of river as seen from Brooks-Scanlon mill

The railroad and lumber mills created an explosion in Bend's population and increased the number of residents to more than 5,000 persons by 1920. These same forces led to a tremendous growth in commerce and housing that is still evident today in much of downtown and older residential areas west and south of downtown. As a result, many of the historic buildings and structures listed in the city's inventory of historical buildings and places are direct products of the boom period of the first part of the 20th century.

The Bend area history is recorded by the Deschutes County Historical Society. This organization maintains and operates the Des Chutes Historical Center in the old Reid School building at the south end of downtown. The Historical Society assists the city and county in their efforts to assess, record and preserve historic and cultural sites within the urban area. Such efforts are important because:

- public awareness of Bend's historical and cultural background has been and will continue to be an important source of knowledge, pride, education, and enjoyment for visitors and residents;
- rapid growth and development make it imperative that the city's historical and cultural resources be identified and protected; and
- properly restored and utilized historical and cultural resources enhance the economy of the area.

Oregon Administrative Rules describe how local historic resources are to be evaluated, and the rules establish certain standards for historic resources of "statewide significance" and property owner notification. Table 3-1 on the next two pages lists the historic structures and sites that played a part in the growth and development of the Bend urban area.

Table 3-1
Inventory of Historic Sites in the Bend Urban Area

HISTORIC STRUCTURES	LOCATION
H. E. Allen House	875 Brooks Street
Bend Athletic Club Gymnasium✶	520 NW Wall Street
Bend Railroad Depot	1160 NE Division Street
Bend Water & Light Co. Powerhouse/dam	Foot of Vermont Street
Bend Woolen Mill	1854 NE Division Street
Charles Boyd Homestead✶	20410 Bend River Mall Drive
Cozy Hotel	327 NW Greenwood Avenue
Deschutes County Library Building✶	507 NW Wall Street
Delaware Grocery	845 NW Delaware Avenue
Downing Hotel	1033 NW Bond Street
Trinity Episcopal Church✶	469 NW Wall Street
First Presbyterian Church	157 NW Franklin Avenue
A.L. French Home	429 NW Georgia Avenue
Hoover's Universal Garage	124-128 NW Greenwood Avenue
Steidl and Tweet irrigation dam	Division St. near Yale Avenue
Kenwood School	701 NW Newport Avenue
Keyes House	912 NW Riverside Boulevard
Liberty Theatre	849-851 NW Wall Street
Lucas House	42 NW Hawthorne Avenue
Thomas McCann House✶	440 NW Congress Street
Mountain View (Mayne) Hospital	515 NW Kansas Avenue
August Nelson Building	838 NW Bond Street
Niswonger House	44 NW Irving Avenue
O'Donnel Building	921-933 NW Wall Street
Old Clinic	731 NW Franklin Avenue
Old Bend High School Building✶	520 NW Wall Street
O'Kane Building✶	115 NW Oregon Avenue
George Palmer Putnam House	606 NW Congress Street
Pierson Blacksmith Shop	211 NW Greenwood Avenue

Table 3-1
Inventory of Historic Sites in the Bend Urban Area

HISTORIC STRUCTURES	LOCATION
A. J. Tucker Blacksmith Shop	200-202 NW Greenwood Avenue
James E. Reed House	45 NW Greeley Avenue
Reid School✶	129 NW Idaho Avenue
Evan A. Sather Home✶	7 NW Tumalo Avenue
Sawyer House	434 Drake Road
St. Francis Catholic Church	494 NW Lava Road
Shevlin-Hixon Executive House	545 NW Congress Street
N.P. Smith Pioneer Hardware Building✶	935-937 NW Wall Street
Spheir Building	901 NW Bond Street
Stover House✶	1 Rocklyn Road
Old U.S. Post Office✶	777 NW Wall Street
John I. West Building	130 NW Greenwood Avenue
Wright Hotel✶	215 NW Greenwood Avenue
Nels and Lillian Andersen House	63160 Nels Anderson Road
SITES DESIGNATED WITH PLAQUES	**LOCATION**
1813 Rock	129 NW Idaho Street
Bend School Landmark	Drake Park
A.M. Drake Homesite	Drake Park
Foley Landmark	Pilot Butte State Park
Johns Landmark	Drake Park
Oregon Trunk Freight Warehouse Site	Railroad tracks & NW Division
Pilot Butte Inn Site	1133 NW Wall Street
Shevlin-Hixon Mill site	Shevlin Center near dam
Central Oregon Pioneers' Landmark	Pioneer Park
Weist Homesite Landmark	1315 NE Third Street
Brooks Scanlon Craneshed Site	721 SW Industrial Way

✶ Sites on the National Register of Historic Places

The items in Table 3-1 represent the city's official list of historic places compiled by the city and county, and approved by the Oregon Land Conservation and Development Commission. Any land use action or building modification to the historic structures on the approved list must be reviewed and approved by the joint city/county Historical Landmarks Commission, a citizens committee established in 1980.

Additional information and evaluation of historic sites is contained in resource material available at the city and county planning departments, the Des Chutes Historical Center, and in rules adopted by the state Land Conservation and Development Commission.

Cultural Amenities

Central Oregon's abundance of scenic and recreational amenities is complemented by a rich and diverse cultural climate of theater, music, and art in Bend. Performing arts can be seen throughout the year at the *Community Theatre of the Cascades* in downtown Bend. The

Community Theatre has been putting on professional caliber productions since the early 1980s. In addition, the Central Oregon Community College *Magic Circle Theatre* is the venue for both college and community programs. There is also interest in the community to renovate the downtown *Tower Theater* building so that it can be used for lectures, concerts and other community events.

Bend hosts one of the state's leading music festivals in Drake Park along the banks of the Deschutes River. Each summer the Cascade Festival of Music presents ten days of classical, pops, and jazz concerts that draws in performers and visitors from all over the country. The Munch & Music series of evening concerts in the park during the summer is another opportunity for the community to gather together to enjoy free music, fine food, and friends in beautiful surroundings. The community college Central Oregon Symphony, jazz band, and choir perform several times a year for area residents.

The visual arts are represented with public art on street corners, at public buildings, and through exhibits at several public and private galleries in downtown Bend and elsewhere in the community. Several times each year the downtown merchants sponsor "Art Hops" when painters, sculptors, weavers and other artisans demonstrate their craft in the downtown stores. In addition to these amenities, the community supports other cultural events to celebrate cultural and ethnic diversity in Central Oregon.

Just south of the urban area is The High Desert Museum, a nationally renowned, living, participatory museum with a wide variety of indoor and outdoor exhibits on nature, art, science, pioneer life, and Native American life on the high desert plateau. The museum also offers a year-round education program of classes, lecture series, and field excursions.

Park and Recreation Facilities

The City of Bend has a long history of park development, beginning with the creation of Drake Park in 1921. Drake Park, the first of several parks along the Deschutes River, has become part of the identity and heart of the community. For decades Bend's citizens and visitors have enjoyed the many parks for their beauty, for sporting events, for community celebrations, and for casual recreation.

Since 1974 all of the public parks and recreation facilities within the urban area have been developed and managed by the Bend Metro Park and Recreation District, a separate special district that serves the Bend area. The Park and Recreation District's *Comprehensive Management and Development Plan* assesses the district's services and operations, and establishes the framework for park and recreation planning within and adjacent to the Bend urban area.

The Bend Metro Park and Recreation District has almost three dozen park sites in the urban area, and more than 900 acres of park land in the urban area. The older neighborhoods in the west and central part of the urban area are generally well represented with parks that were developed before the 1970s. The parts of the urban area that experienced rapid residential growth in the 1990s have few developed park sites, although the district does have undeveloped park land on the east and north side of the urban area. In addition to the local park and recreation district facilities, Pilot Butte State Park—a volcanic cinder cone in the center of town with a commanding view of the urban area—is a favorite spot for residents and visitors.

Figure 3-2, Providence Neighborhood Park

The Bend Metro Park and Recreation District also provides a large and diverse recreation and fitness program for Central Oregon residents. These programs offer a wide range of year-round activities for youngsters and adults. One set of programs, in cooperation with the local school district, provides after school activities and sports for school students.

There is strong community interest in adding more park and recreation facilities to meet the ever increasing needs created by the expanding urban population. The Bend Metro Park and Recreation District Board has identified the following priorities for future development:

- new sports parks for children's soccer and baseball, and adult softball field;
- acquisition of riverfront park land and/or conservation easements;
- preserving and expanding the public and private trail system along the Deschutes River and Tumalo Creek; and
- development of neighborhood parks.

The Comprehensive Plan recommends the development of a trail system along the river wherever possible in an effort to provide public access to this outstanding natural feature. The park district already manages the 2½ mile River Run trail at the north end of the urban area, and is working with property owners to develop other river trail segments. Several miles of riverfront trails also exist on private property, but are open to the public. In addition to the river trails, the Comprehensive Plan recommends a system of recreation and transportation trails, which would interconnect neighborhoods, parks, and schools. More information on the urban area trails and a map of the trail system are included in Chapter 7, *Transportation System.*

The Bend Comprehensive Plan also supports and recommends a park and recreation system which would place a neighborhood park within walking distance of every residence in the community, as well as take advantage of natural sites within the area. There are many opportunities for new parks to be developed in conjunction with future school sites. The Bend Metro Park and Recreation District, the Bend-La Pine School District, and the city and county work together to coordinate the planning of park and school facilities to serve the growing urban population.

A park facility located adjacent to a school has essentially the same service area as the school, and this approach to park planning has several advantages. The combined school and park make a year- round center for educational and recreational activities and allow each facility to be designed to complement the needs of both the park district and the school district. The coordinated school-park program may also afford an opportunity for cost savings to both districts. Besides eliminating some duplicate facilities, the coordination of siting new schools and

parks could reduce the cost of acquisition, development, and maintenance of each type of facility.

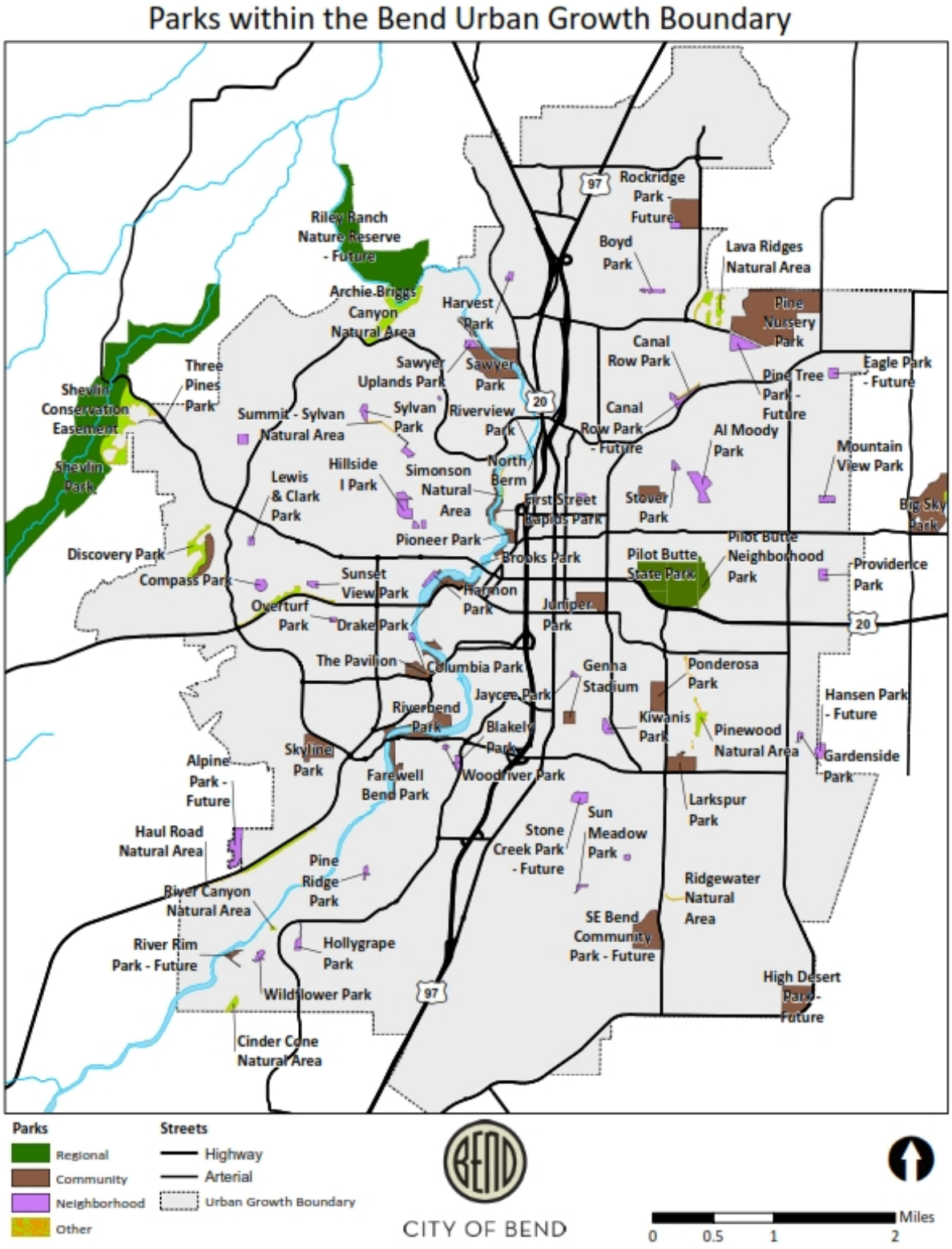
Table 3-2 on the next page provides a summary of the area's existing public park and recreation facilities managed by the park district and Oregon State Parks (as of 1996). The number and type of facilities planned by the Bend Metro Park and Recreation District through 2005 are also listed in the table. Figure 3-4 is a map of park sites in the urban area.

Table 3-2
Public Park and Recreation Facilities in and near the UGB

TYPE OF FACILITY	EXISTING FACILITIES (1996)		PLANNED 1995-2005	
	Quantity	Developed and Natural Acres	Quantity	Total Acres
PARKS AND OPEN SPACES				
A. Neighborhood Parks	11	46.3	11	73.2
B. Community Parks	3	102.9	6	282.4
C. Metro / Regional Parks	2	655.9	(none)	0
D. Riverfront Parks	11	28.0	2	28.5
E. Sports Parks	2	35.0	2	195.0
F. Downtown / Urban Parks	(none)	0	(none)	0
G. Mini-Parks / Pocket Parks	(none)	0	(none)	0
H. Historic Sites	1	16.5	(none)	0
I. Greenway / Natural Areas / Preserves	2	6.8	(none)	0
J. Bikeways / Pathways / Trails	2	14.0	2	80.0
Total Parks and Open Spaces	34	905.4	23	659.1
RECREATIONAL FACILITIES	EXISTING		PLANNED	
	Quantity	Sq. Feet	Quantity	Sq. Feet
A. Aquatic / Fitness Centers	1	22,000	1	40,000
B. Community / Recreation Centers	0	0	3	80,000
Total Recreation and Support Facilities	1	22,000	4	120,000

Source: Bend Metro Park and Recreation District *Comprehensive Management and Development Plan*, City Planning Department parks and open space inventory.

Figure 3-4


Parks within the Bend Urban Growth Boundary
Riley Ranch Nature Reserve - Future
Archie Briggs Canyon Natural Area
Harvest Park
Rockridge Park - Future
Boyd Park
Lava Ridges Natural Area
Pine Nursery Park
Canal Row Park
Eagle Park - Future
Pine Tree Park - Future
Three Pines Park
Shevlin Conservation Easement
Shevlin Park
Sawyer Uplands Park
Sawyer Park
Summit - Sylvan Natural Area
Sylvan Park
Riverview Park
Canal Row Park - Future
Al Moody Park
Mountain View Park
Hillside I Park
Simonson Natural Area
North Berm
Lewis & Clark Park
First Street Rapids Park
Stover Park
Big Sky Park
Pioneer Park
Discovery Park
Compass Park
Brooks Park
Pilot Butte State Park
Pilot Butte Neighborhood Park
Providence Park
Sunset View Park
Harmon Park
Juniper Park
Overturf Park
Drake Park
The Pavilion
Columbia Park
Genna Stadium
Ponderosa Park
Jaycee Park
Hansen Park - Future
Riverbend Park
Kiwanis Park
Pinewood Natural Area
Blakely Park
Skyline Park
Gardenside Park
Alpine Park - Future
Farewell Bend Park
Woodriver Park
Larkspur Park
Sun Meadow Park
Haul Road Natural Area
Stone Creek Park - Future
Pine Ridge Park
Ridgewater Natural Area
River Canyon Natural Area
SE Bend Community Park - Future
River Rim Park - Future
Hollygrape Park
Wildflower Park
High Desert Park - Future
Cinder Cone Natural Area
97
20
Parks
Regional
Community
Neighborhood
Other
Streets
Highway
Arterial
Urban Growth Boundary
CITY OF BEND
Miles
0
0.5
1
2

More detailed descriptions and information on existing and planned park district facilities are in the district's *Comprehensive Management and Development Plan.* In addition to the facilities listed in the table and shown on the map, the Bend Metro Park and Recreation District has title to more than 1,100 acres in six sites outside the urban area.

Existing developed and undeveloped park and recreation sites are shown on the Comprehensive Plan Land Use Map. The Bend Metro Park and Recreation District has described the types and number of new facilities it thinks the community needs to develop during a ten-year period ending in 2005. Because the long-term, 20-year park and recreation needs and corresponding locations have not yet been determined, the Comprehensive Plan Land Use Map displays a symbol that represents the general location for future parks in those neighborhoods where a specific site has not been selected. As the Bend Metro Park and Recreation District updates its *Comprehensive Management and Development Plan* with new information on neighborhood parks or other facilities, the general symbol for future park sites on the Land Use Map will be replaced with specific demarcations.

Until the 1998 update of the Comprehensive Plan, neither the city nor the county had a separate zoning district designed to protect and enhance parks and public open space. The city and county now have a Public Facilities plan designation that is applied to developed park facilities, schools, public owned natural areas, and other types of open space.

In addition to the public recreation facilities provided by the Bend Metro Park and Recreation District, there are six private golf courses within the Urban Growth Boundary, and two more just outside the Urban Reserve Area. Four of the courses within the urban area are currently open to the public. Besides providing recreational opportunities for residents and visitors, these golf courses serve a secondary role of providing some of the "large developed" open space within the urban area.

Public Education

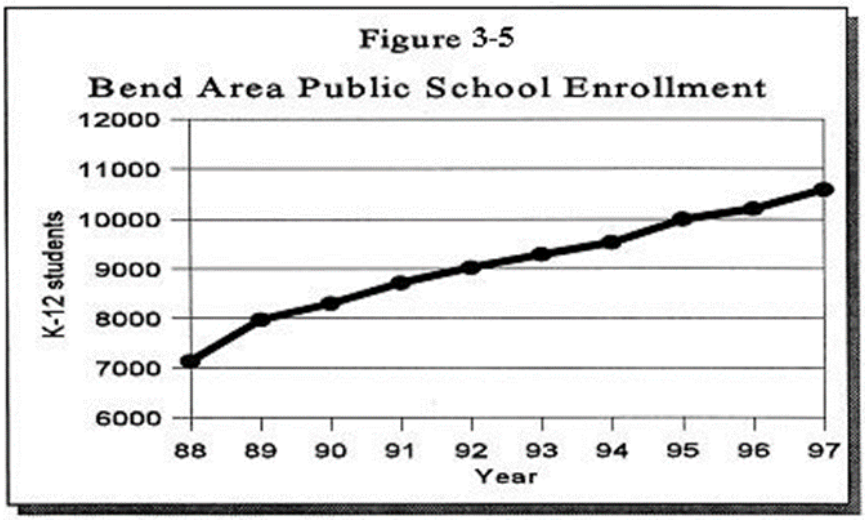
The sections below describe the existing and planned public education facilities in the urban area. In addition to the public school system, there are several private and parochial schools that provide elementary and secondary education.

The Bend-LaPine School District

The Bend-La Pine School District is the only public school district serving the urban area. At the end of the 1990s, the district operated nine elementary schools, three middle schools, two high schools, and several small special "magnet" programs within or adjacent to the Urban Growth Boundary. These schools serve the Bend urban area and several thousand households outside the urban area. Roughly two-thirds of the students in the Bend schools are from within the urban area. In addition to the Bend schools, the district has schools in Sunriver and La Pine that served about 1,650 students in 1997.

During the high growth period of 1988 through 1997, enrollment in the Bend schools increased almost 48 percent. This dramatic increase in students is another indicator that the majority of people moving to Central Oregon are not elderly, but younger families with school age children. Figure 3-5 shows the increase in total enrollment in the Bend schools for the ten year period ending in 1997.

Figure 3-5



Source: Bend-LaPine School District

In the early 1990s the Bend-La Pine School District constructed two elementary schools and one middle school to meet the rapid population growth. These new schools were above or near their maximum enrollment capacity within a year or two after they opened. Table 3-3 below compares the student load in 1997 with the design capacity of each school.

Table 3-3
Bend Urban Area Public School Facilities

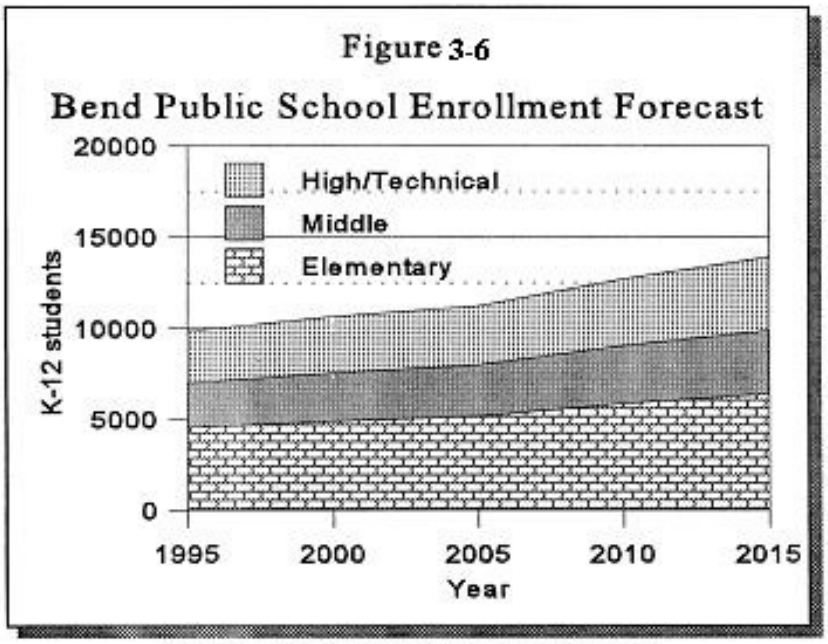
Facility Name	Grades	Site Acres	Number of Classrooms	Maximum Enrollment	Enrollment in 10/97	Percent of Capacity
Bear Creek Elem.	K-5	37.40	25	681	571	84%
Buckingham Elem.	K-5	20.50	24	662	634	96%
Elk Meadow Elem.	K-5	13.00	24	650	702	108%
Jewell Elementary	K-5	16.74	24	675	596	88%
Juniper Elementary	K-5	30.41	24	675	551	82%
Kenwood Elem.	K-5	4.17	17	423	80	90%
Kingston Elementary	K-3	3.00	9	166	192	116%
Lava Ridge Elem.	K-5	40.00	24	650	671	103%
Thompson/Amity Creek Elementary	K-3	1.40	8	156	272	174%

Facility Name	Grades	Site Acres	Number of Classrooms	Maximum Enrollment	Enrollment in 10/97	Percent of Capacity
Cascade Middle	6-8	34.37	38	757	755	100%
High Desert Middle	6-8	85.00	39	800	869	109%
Pilot Butte Middle	6-8	33.13	39	825	963	117%
Bend High	9-12	68.00	72	1432	1528	107%
Mountain View High	9-12	30.00	62	1322	1730	131%

Source: Bend-La Pine School District. Acreage figure may include additional land held by the district. Classroom number includes modular units.

In October 1997, the school board accepted a school siting study prepared for the district in cooperation with the city and county. This study provides information on enrollment, siting needs, and other factors to help the district determine the type, location, and size of school sites needed during the next 20 years.

The school district's estimate of future enrollment levels and school needs is based on the forecast population levels in the urban area and nearby rural lands.



Source: Bend-La Pine School District, 1997

Figure 3-6 shows the 1995 student levels and the forecast enrollment level for the public schools based on the 1997 siting study. It can be seen from the data in this figure that total enrollment in the Bend area public schools is expected to increase about 45 percent by the year 2015.

If the population growth and demographic patterns follow the forecasts in the 1997 study, there will be a need for three to five additional elementary schools, two to three new middle schools, and one or two new senior high schools or technical schools in the planning area by 2015. In 1998 local voters approved a $57 million bond levy to help meet the need for more schools. The bond will pay for construction of a new elementary school, a new middle school, a new high school and remodeling Bend High.

Identifying the location for new public schools is an important function of the Comprehensive Plan. The need for new schools is closely related to residential development and housing densities in the community. It is extremely important that schools be located with reference to the development pattern indicated on the Comprehensive Plan.

Elementary schools in particular can have a significant influence on the location or direction of growth in any given area, and will in themselves attract residential development. They should be centrally located in their service area, and spaced in a way that will permit reasonable locations for future schools as the area continues to grow. The city, county and Bend-La Pine school district will use the most recent studies to evaluate ways to ensure the timely development of new schools in the urban area.

Colleges and Universities

Central Oregon Community College is the state's oldest two-year college, having been created in 1949. Located on the west slope of Awbrey Butte, the 200 acre campus features a 102 student residence hall, a 38,000 volume college/community library, a 300-seat performing arts center, and several lecture halls. The college has a long-standing policy to encourage community use of its buildings and facilities.

The college enrolls about 3,200 full-time and part-time students each term, plus another 3,000 to 4,000 community education students taking non-credit courses. Degrees offered by COCC include the Associate of Arts degree, the Associate of Science degree, and the Associate of Applied Science degree covering several technical and professional fields. The college serves more than just the Bend area, and its instructional programs extend to a 10,000 square mile service area through a network of community centers in Christmas Valley, La Pine, Madras, Prineville, Redmond, Sisters, and Warm Springs.

OSU-Cascades, a branch campus of Oregon State university opened its doors in 2001 on the COCC campus. OSU-Cascades expanded to a four-year university when it welcomed its first freshman class in 2015.

POLICIES

Historic Sites

3-1 The City encourages the preservation, rehabilitation, and reuse of historic structures whenever practical.

3-2 The City will continue to encourage identification and preservation of significant historical and cultural sites.

3-3 The preservation of exterior facades should be the emphasis of the City's encouragement of historic preservation.

3-4 The City encourages public educational institutions to promote the importance of Bend's history and historic landmarks.

Parks and Recreation Facilities

3-5 The City will apply a new "Public Facilities" zone for public parks and recreation facilities within the planning area.

3-6 The City shall support efforts by the Park and Recreation District and Bend-La Pine School District to jointly develop school-park sites to meet neighborhood park and school recreation needs.

3-7 Sites for small neighborhood parks are not shown on the Land Use Plan Map, but the city shall encourage private or public parties to develop small neighborhood parks.

3-8 The City shall refer to the park district, for its review and recommendations, all development proposals that include or are adjacent to existing or proposed parks or trails.

Urban Trails

3-9 The City will continue to work with the county, irrigation districts, state and park district to develop a series of trails along the Deschutes River, Tumalo Creek, and the major canals so that these features can be retained as an asset in the urban growth boundary and urban reserve area.

3-10 The trails designated on the Bicycle and Trail System map shall be the basis for developing a trail system that serves the recreational and transportation needs of the community.

3-11 The City, when practical, shall require connecting links to the urban trail system from all adjacent new developments.

Schools

3-12 The City will plan for safe streets, pedestrian, and bike facilities adjacent to the school sites as new schools are erected.

3-13 The City will coordinate with the Bend La-Pine School District to increase pedestrian and bicycle accessibility to schools.

3-14 When legally allowed, the City may require major new developments to reserve land for school purposes in conjunction with the Bend-La Pine School District's adopted plan for the type and location of future facilities.

Chapter 4: Population and Demographics

Adopted Amendments

EFFECTIVE DATE	ORD #	CHANGES
November 18, 1998	Resolution #2247	Comprehensive Plan update
2016	NS-2271	Format update, minor text changes to remove outdated text

BACKGROUND

Context

In 2013 the Oregon House of Representatives and the Senate approved legislation assigning the coordinated population forecasting to the Population Research Center (RC) at Portland State University (PSU). This action eliminates the need for an entire chapter of the Comprehensive Plan dedicated to population forecasting and demographics. The contents of this chapter will be retained for historic context until such time the city can begin a public process to update the Comprehensive Plan. New policies on population forecasting will be located in the new Housing Chapter 5.

Goals

A major goal of the land use planning process is to ensure that there is sufficient land within the urban growth boundary for housing, for business and industry, for public services such as parks and schools, and an adequate transportation system to serve those needs. The forecast of growth and change in the urban area population is an important component in determining these land use needs. It is a goal of the city to use and evaluate the best historic information and expert forecasts in preparing this chapter. Regular updates of population and demographic information will be conducted to keep these forecasts current.

Overview

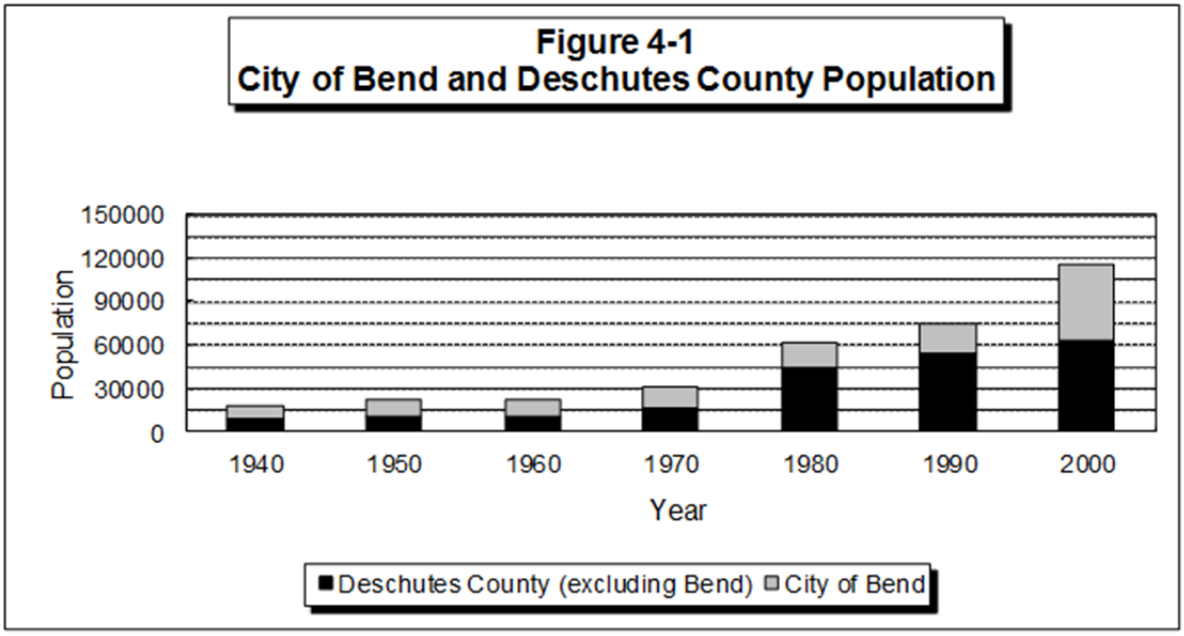
Rapid population growth is nothing new to Bend. Fifteen years after its incorporation as a city of about 500 persons in 1905, the population had exploded to more than 5,400 persons after the building of two large sawmills at the south edge of town. In later decades the Bend area and Deschutes County, like the rest of the state, experienced cycles of population growth tied to economic conditions. Bend is the eighth largest city in Oregon and the largest Oregon city east of the Cascade Mountains.

As the population has grown, it also has become younger and more affluent, conditions that can be traced in part to the expansion of the local outdoor recreation businesses and the in-migration of “baby-boomers” from California and the Northwest.

Population History

Historically, the City of Bend population made up about half of the Deschutes County population. This changed in the 1960s when thousands of rural recreational lots and suburban lots were platted in the county outside of urban areas.

Much of the county population growth in the 1970s and 1980s was driven by persons seeking open space rather than urban lots. Figure 4-1 shows the change in population since the 1940 census.



The late 1980s marked the swing out of a recessionary period in Central Oregon and into better economic times. Bend's expanding role as the regional trade and service center, combined with its attractiveness as a year-round tourism and recreation area, fueled another surge of population and employment growth that continued through the 1990s and has become stronger during the early 2000s.

Growth during the 1990s

The 1990 census counted 20,469 persons within the city limits of Bend. The population within the county portion of the urban areas was estimated to be 12,100 based on census tract data for the "Bend District," for a total of 32,569 persons within the UGB in 1990.

During the 1990s, the rate of population growth in the City of Bend and Deschutes County was among the highest in the state. By the year 2000, the city population was 52,029 persons – up 31,560 persons since the 1990 census – although much of the city's increase during this period was due to annexing all unincorporated areas in the UGB in 1999. The Portland State University Center for Population Research and Census estimated the annexed population to be 13,648 persons. Even accounting for the annexations, the population of Deschutes County excluding the City of Bend increased by 8,849 persons, from 54,489 to 63,338 persons, much of this growth occurring in the Cities of Redmond and Sisters. The total population of the county, including the City of Bend increased from 74,958 to 115,367 persons in the year 2000, which equates to an average annual growth rate of 4.4 percent per year. At the same time, the average annual growth rate for the State of Oregon was 1.9 percent per year.

Excluding the 13,648 persons annexed in to the City of Bend in 1999, and another 3,411 annexed between 1990 and 1998, the city's population increased by 14,501 during the 1990s, which equates to an average annual growth rate of approximately six (6) percent per year.

The annual rate of growth in Bend during the 1990s was more than three times the statewide average. To put this increase in perspective, in the year 2000 one out of three Bend urban area residents did not live in the area in 1990. Table 4-1 below displays the results of the 1990 and 2000 Census counts for Deschutes County and how the population is distributed between the cities and the unincorporated county.

Table 4-1
Distribution of County Population in 1990 and in 2000

Jurisdiction	April 1, 1990 Population	Percent of Total	April 1, 2000 Population	Percent of Total
Deschutes County	74,958	100%	115,367	100%
Bend	20,469	27%	52,029	45%
Redmond	7,163	10%	13,481	12%
Sisters	679	1%	959	1%
Total Pop in Cities	28,311	38%	66,469	58%
Total Unincorporated	46,647	62%	48,898	42%

Source: U.S. Census Bureau Summary Tape File 1 (1990) and Summary File 1 (2000).

The growth pressures in the 1990s affected not only Bend, but all of Central Oregon. Between 1990 and 2000 Deschutes County was the fastest growing county in the state, Jefferson County was third, and Crook County was fourth. Although the total Deschutes County population increased by more than 40,400 persons in ten years, the growth pattern in the 1990s was different than the previous boom in that most of the new residents settled in the urban areas.

One result of this population growth is that Bend was designated by the federal government as a metropolitan statistical area in June of 2003. An MSA is county that has a city with a population of 50,000 or more. The purpose of defining geographic areas like an MSA is to establish nationally consistent area definitions for collecting, tabulating, and publishing federal statistics. The Bend MSA represents Deschutes County.

Age Distribution

The Census data for Bend include demographic information on the age of residents. Table 4-2 compares the age distribution in four broad groupings for the city population since the 1970 census. The 2000 census data are also compared to the county and state populations, and show that the city population was younger than the overall county and statewide population averages.

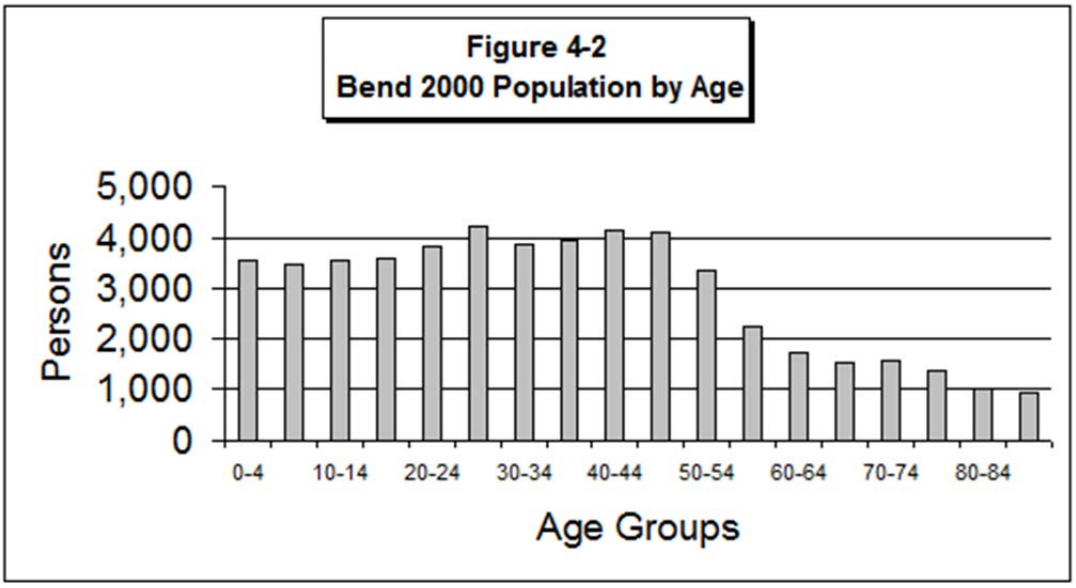
Table 4-2
Comparison of Bend Age Groupings Over Time

Age Range	City of Bend				County	Statewide
	1970	*1980*	*1990*	*2000*	*2000*	*2000*
Age 0-24	*43.5%*	*42.7%*	*35.3%*	*34.7%*	*32.6%*	*34.3%*
Age 25-44	*22.6%*	*31.6%*	*36.3%*	*31.1%*	*28.6%*	*29.2%*
Age 45-64	*22.3%*	*15.2%*	*14.9%*	*21.8%*	*25.7%*	*23.7%*
Age 65+	*11.6%*	*10.5%*	*13.5%*	*12.4%*	*13.1%*	*12.8%*

Source: *U.S. Census reports and Portland State University Center for Population Research and Census*

Table 4-2 and Figure 4-2 show that Bend's population in 2000 was not that different from the populations of the County and the State. The greatest difference between these populations is that Bend's population in 2000 included more persons between the ages of 25-44 than the county or the state. In contrast, the Census counted fewer people in the 45-64 range in Bend than in the county or the state.

Figure 4-2
Bend 2000 Population by Age



Source: U.S. Census of Population and Housing, 2000: Summary File 2.

As was indicated above, Deschutes County was the fastest growing county in the state in the 1990s. Between 1990 and 2000, the County's population grew by 40,409 people, an increase of almost 54 percent. A majority of the increase (88 percent) was from "positive net migration" – the number of people moving into the county exceeded the number of people moving out. Similarly, most of the increase in the Bend UGB population since 1990 is attributed to in-migrants. Table 4-3 displays the population change data by natural increase and net migration for Deschutes County between 1980 and 2000. During the 1990 to 2000 period, population increase due to natural increase (births-deaths) decreased while the net migration component of population change (in-migrants – out-migrants) increased. Net migration accounted for 88 percent of the county's population growth during the 1990s. In contrast, net migration accounted for 73 percent of the state's population growth.

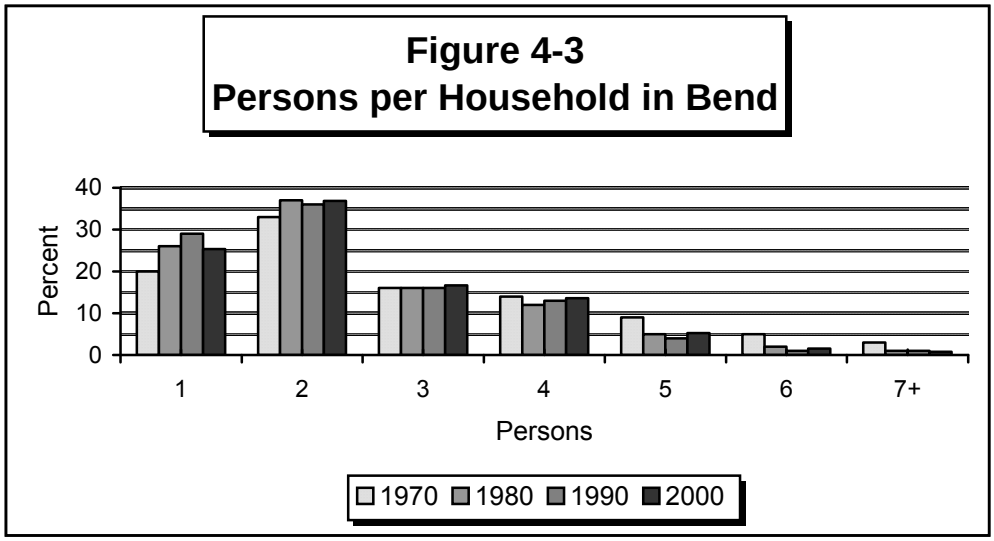
Table 4-3
County Population Change and In-migration

Time Period	Population Change	Natural Increase	Net Migration All Ages
4/1/80 - 4/1/90	+13,458	4,878 (36%)	8,580 (64%)
4/1/90 - 4/1/00	+40,409	4,713 (12%)	35,696 (88%)

Source: Portland State University Center for Population Research and Census

Persons per household

The average number of people living in a dwelling, whether as a family or a household of unrelated persons, is a useful measurement to help forecast how many dwellings will be needed in the future. Figure 4-3 shows the percent of Bend households by number of persons for the past four census periods. Bend was following a trend toward smaller household size. However, the most recent Census data shows the number of households with three or four persons remains constant or represents a larger share of the number of households.



Source: U.S. Census of Population and Housing. For 2000 data, Summary File 1.

Table 4-4 compares the average household size for the city, county, and state since 1950. This comparison of persons per household shows a trend of fewer persons per household continuing for the county and the state. Bend differs in that an average household size of 2.4 persons per household has remained constant between 1990 and 2000.

Table 4-4 Average Persons Per Household						
Area	1950	1960	1970	1980	1990	2000
All of Oregon	3.1	3.1	3.0	2.6	2.6	2.5
Deschutes County	3.2	3.1	3.0	2.7	2.6	2.5
City of Bend	3.0	3.0	2.9	2.5	2.4	2.4

Source: U.S. Census reports for Oregon

Education and Occupation

As reported in the 2000 census, the education levels in Bend were a few percentage points higher than the county and the statewide averages. For those Bend residents aged 25 or older at the time of the 2000 census, 90.2 percent had a high school degree or higher, and 29.4 percent had a bachelor's degree or higher. Many of the new jobs created in the urban area since the 1990s have been skilled or professional jobs in the service sector, finance, research, government, and manufacturing. This fact, combined with evidence from state surveys that a number of persons moving into the area have some college education, suggests that the percentage of education levels in the community will continue to increase. Additional information on education services and programs is contained in Chapter 3, *Community Connections.* The following presents the occupational employment data for Deschutes County from April 2001 through April 2005 to highlight the changes in employment over the last four years.

Table 4-5
Occupations in Deschutes County in April 2001 and April 2005

Occupation	April 2001	April 2005	Change	Percent Change	Percent of Total in 2004
Natural resources, Mining, and Construction	4,430	6,330	1,900	43%	10.3%
Manufacturing	5,400	5,920	520	10%	9.6%
Trade, transportation, and utilities	10,720	12,110	1,390	13%	19.7%
Information	1,430	1,550	120	8%	2.5%
Financial activities	3,390	4,050	660	19%	6.6%
Professional and business services	4,630	6,190	1,560	34%	10.1%
Educational and health services	6,030	7,270	1,240	21%	11.8%
Leisure and hospitality	7,500	8,340	840	11%	13.6%
Other services	1,650	1,800	150	9%	2.9%
Government	7,370	7,880	510	7%	12.8%

Sources: Oregon Labor Market Information System April 2001 and April 2005 data for Bend MSA (Deschutes County)

Income levels

The median (middle) household income in the City of Bend in 1989 (from the 1990 Census) was $25,787. The median household income in Deschutes County was a little higher, at $27,317 during the same period. Table 4-6 displays the 2000 Census data for household and family income for Bend. The 2000 Census showed the median household income was $40,857, and was $45,357 for families. The category of family with 2 workers represents the large share of family households in Bend and those households that had the greatest median income in 1999.

Table 4-6
Income Levels in Bend (1999 dollars)

Household Category	Median for 1999	Percent of Total
Household	$40,857	
Family with no workers	$34,140	12.6%
Family with 1 worker	$32,669	29.1%
Family with 2 workers	$60,907	48.9%
All families	$45,357	100%

Source: U.S. Census of Population and Housing, 2000: Summary File 4

Table 4-7 shows the 1999 income levels of households by the age of the household. This information is particularly useful in planning for housing, especially in determining what forms of housing will be more affordable to certain households. The age groups with the lower income levels, according to this data, are younger individuals and families and older retired (75+) persons.

Table 4-7
Householder Age by Income Levels

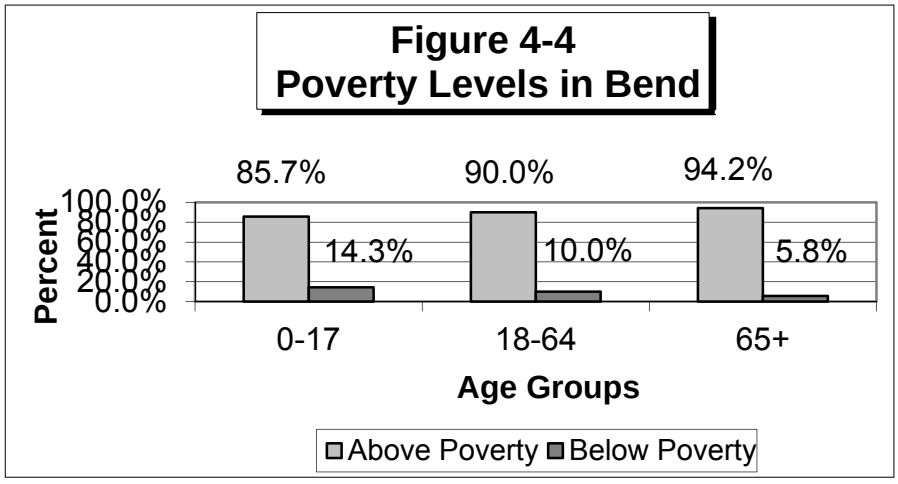
1999 Gross Income	0 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65 - 74	75+
Less than $10,000	9.5%	4.9%	4.1%	5.2%	8.9%	7.7%	14.6%
$10,000 to $14,999	14.6%	5.8%	4.9%	3.8%	3.5%	6.3%	18.0%
$15,000 to $19,999	15.4%	7.1%	3.9%	5.3%	2.4%	10.0%	8.8%
$20,000 to $24,999	10.6%	6.8%	4.4%	5.3%	5.1%	7.5%	10.4%
$25,000 to $29,999	12.2%	7.5%	6.6%	5.6%	7.5%	8.7%	11.9%
$30,000 to $34,999	10.6%	8.5%	8.6%	4.6%	8.4%	12.6%	8.2%
$35,000 to $39,999	7.4%	8.9%	7.2%	4.1%	4.5%	6.4%	5.3%
$40,000 to $44,999	7.2%	5.6%	6.9%	5.8%	4.9%	5.8%	2.3%
$45,000 to $49,999	2.9%	7.2%	7.1%	5.2%	6.1%	4.7%	4.2%
$50,000 to $59,999	4.8%	13.9%	10.6%	11.9%	8.1%	4.9%	3.9%
$60,000 to $74,999	2.2%	13.0%	13.2%	11.9%	12.6%	7.3%	4.6%
$75,000 to $99,999	1.2%	6.1%	13.6%	14.2%	13.4%	8.9%	3.1%
$100,000 to $124,999	0.8%	2.9%	4.0%	7.8%	5.9%	1.9%	3.3%
$125,000 to $149,999	0.6%	0.6%	1.6%	3.4%	2.6%	3.6%	0.9%
$150,000 to $199,999	0.0%	0.6%	1.5%	2.8%	2.0%	3.0%	0.5%
$200,000 or more	0.0%	0.6%	1.8%	3.1%	4.1%	0.7%	0.0%
Columns read down	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: US Census of Population and Housing, 2000: Summary File 3.

A related measure of income levels is the number of persons below the poverty level. Poverty levels reported in the 2000 Census are determined by comparing local incomes to a national standard of 48 income thresholds tied to the number and age of persons in the household. The national standards are not adjusted for state, regional, or local cost of living variations.

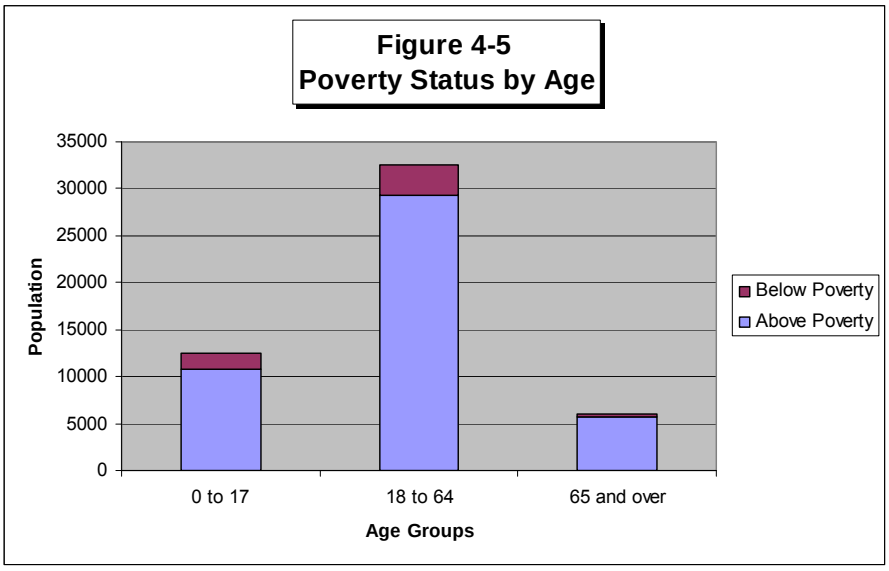
Figure 4-4, using 2000 Census data, shows the relationship of persons in three broad age groups to the national poverty standards. Although the percentage of Bend residents living below the poverty level decreased from 13.2 percent in 1989 to 10.5 percent in 1999, the number of Bend residents living below the poverty level increased from 2,637 people in 1989 to 5,380 people in 1999. The poverty level in Bend is slightly

higher than the county level of 9.2 percent. It is interesting to note that only 12.6 percent of Bend households below the poverty level are receiving public assistance. This may be due, in part, to the number of students and young recreational enthusiasts in Bend that generally have lower incomes.



Source: U.S. Census of Population and Housing, 2000: Summary File 3.

Figure 4-5 provides detail on the number of persons above or below poverty.



While Figures 4-4 and 4-5 show the relationship of Bend residents to the poverty levels, they do not show the magnitude of incomes below or above the poverty levels. Table 4-8 shows the levels at which Bend residents were below or above poverty in 1999.

Table 4-8
Income Level in relation to Poverty Level

Ratio of income to Poverty in 1999	Number of Persons	Percent of Total Population
Less than .50	1,670	3.3%
.50 to .74	1,330	2.6%
.75 to .99	2,380	4.7%
1.00 to 1.24	2,199	4.3%
1.25 to 1.50	2,100	4.1%
1.50 to 1.74	2,165	4.2%
1.75 to 1.84	816	1.6%
1.85 to 1.99	1,369	2.7%
2.00 and over	37,013	72.5%

Source: US Census of Population and Housing, 1990: Summary File 3

Both before and after the 1990 Census was taken, county income levels have shown a steady rise. The average income levels of county families and households increased almost 6 percent a year between 1984 and 1995, a rate faster than the statewide averages. Since Bend is the major employment center in the region it is assumed that income levels within the urban area more or less follow the county-wide patterns. The diverse and expanding economy in Bend provides a wide range of job possibilities, including entry level jobs in the trade and services, which allows young people and additional family workers access to jobs.

The Department of Housing and Urban Development estimated the 2004 median family income in Deschutes County at $57,800— more than four thousand dollars above the average for non-metropolitan areas in the state. Since the last half of the 1980s the per-capita income levels in Deschutes County have steadily increased to match the state average. Even more interestingly, the county income levels have been above the Eugene, Medford, and Salem metropolitan areas since the early 1980s.

The Federal Bureau of Economic Analysis (BEA) reports personal income for counties on a per capita basis. For Deschutes County in 2002, the leading source of personal income was net earnings. Income in this category includes earnings from place of work (e.g. wages and salary) and accounted for 60 percent of total personal income in the county. Income from dividends, interest, and rent accounted for 24.2 percent of personal income. Finally, income from personal current transfer receipts (e.g. retirement benefits, Medicare, income maintenance benefits) accounted for 15.8 percent of total personal income.

Forecasts

In the past, several public and private organizations have prepared population and demographic forecasts for the county or region as a whole, but no independent forecasts have been prepared for the Bend urban area:

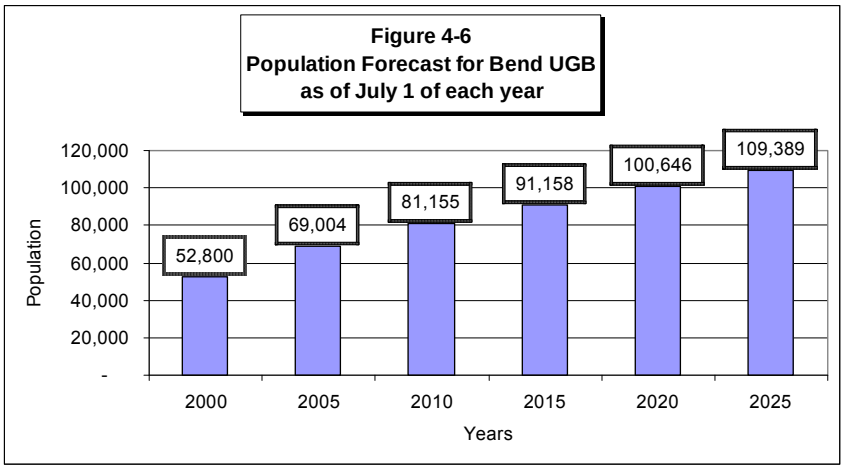
- the Oregon Department of Transportation (1993) — county population and employment forecasts through 2012;
- the Portland State University Center for Population Research and Census (1993) — county population and age forecasts through 2010; and
- the Oregon Office of Economic Analysis (OEA) — county population and employment forecasts through 2040 (1997) and county population forecasts from 2000 to 2040 (2004).

These forecasts were used by the city and county as guides in the coordination of county-wide population forecasts, and the preparation of the urban area population forecast in the plan adopted in 1998. The city coordinated with the planning and legal staff of the cities of Redmond and Sisters and Deschutes County through 2002 and 2004 to develop a final coordinated population forecast for the county and the cities from 2000 to 2025.

Population

All of these forecasts predict continued higher than average growth rates for Deschutes County until early into the 21st century, followed by slower growth rates. The most recent forecasts by OEA (2004) and the coordinated forecast (2004) show the recent trend of steady growth continuing through 2010 and then slowing through 2025. The Bend UGB population forecast for the year 2025 is 109,389. Figure 4-6 shows this forecast in five-year increments.

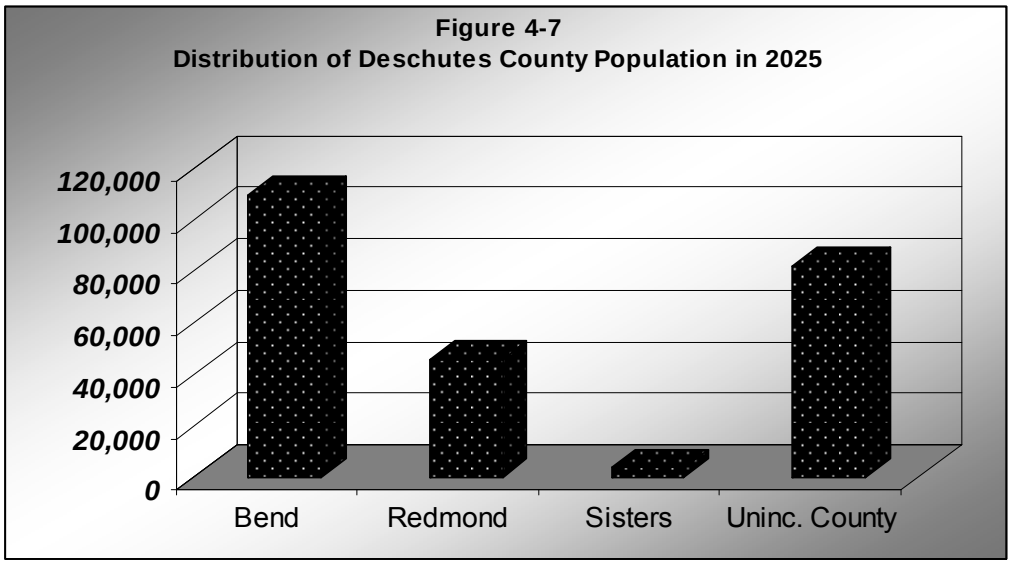
Figure 4-6
Population Forecast for Bend UGB as of July 1 of each year



Source: 2000-2025 Deschutes County Coordinated Population Forecast (August, 2004)

The county and three cities have worked together to coordinate population forecasts for all three urban areas and the non-urban portion of the county. The Bend population forecast is based on a combination of past rates of population growth continuing in the near term and the use of annual growth rates developed by OEA through the long term. Although additional development will occur in rural subdivisions and rural service

centers, the majority of the new residents will settle in the three urban areas. The forecast distribution of the population in the year 2025 is shown in Figure 4-7.



Source: 2000-2025 Deschutes County Coordinated Population Forecast (August, 2004)

As in the past, it is expected that most of the population increase will come from persons moving into the area. The OEA forecast for Deschutes County from 2000 to 2040 shows that most of the future growth in the county's population will be net migration. During the forecast period, net migration accounts for 88 percent to 100 percent of the county's growth in population. By 2025, the percent of the county's growth in population due to net migration will be 94 percent.

Demographics

In the early 1990s about 70 percent of the Bend population was less than 50 years old. The World War II baby-boomers made up the biggest bulge in the population pyramid (about 29 percent in 1990) followed by a plateau of baby-boomer children and grandchildren. In the year 2000 the baby-boomers were in their early 40s to mid-50s age range, and by 2020 they will be in their 60s to mid-70s.

The 2000 Census showed the largest proportion of the city's population was between 25 and 54 years of age representing 45 percent of the city's population. About 27 percent of the population was 19 years or less in age. About 12 percent of the population was 65 years and over in age. The OEA 2000 to 2040 population forecast for Deschutes County included forecasts by age groups. The following table shows the breakdown of age groups for the county in 2000 and in 2025 based on the OEA Deschutes County population forecast for 2000 to 2040.

Table 4-9
Age of Deschutes County Population in 2000 and in 2025

Age Groups	In 2000		In 2025	
	Deschutes County	Percent of Total	Deschutes County	Percent of Total
Total	116,600		214,479	
0-4	7,179	6%	10,647	5%
5-19	24,595	21%	34,460	16%
20-44	39,482	34%	62,654	29%
45-64	30,131	26%	58,738	27%
65-84	13,510	12%	43,303	20%
85+	1,703	1%	4,677	2%

Source: OEA 2000-2040 County Population Forecast

The high percent of growth due to in-migrants affects the population age distribution. Even though the baby-boomer generation will make up part of the growth, an even larger portion of the new residents will be the baby-boomer children and grandchildren. This population growth due to younger people moving into the area will create a population age distribution that is contrary to the historic pattern of the baby-boomer peak followed by a plateau.

Policies

4-1 The city shall review and update the urban area population forecast every five years.

4-2 The city shall update income levels, household size, and other demographic information for the urban area after every U.S. census, or when other data for the City of Bend are available.

Chapter 8: Public Facilities and Services

Adopted Amendments

EFFECTIVE DATE	ORD #	CHANGES
November 1998	Resolution #2247	Comprehensive Plan Update
January 5, 2009	NS-2112	
April 3, 2013	NS-2194	Add Water PFP
December 17, 2014	NS-2230	Add Sewer PFP
2016	NS-2771	Format update, minor text changes to remove outdated text

BACKGROUND

Context

Consideration of the public and private facilities and services within the Bend Urban Growth Boundary is an important focus of the Plan. Several of these services — water, sanitary sewers, energy supplies, and communications — are the backbone needed to support and encourage urban level development. Other urban services such as refuse disposal, emergency services, and storm water disposal are also necessary parts of the mix of urban services. Although most of these facilities and services have a planning horizon greater than 20-years, they are still driven by the population and land use needs forecast in the Plan.

Goals

Adequate public facilities are the key to efficient and stable urban development. The goals below provide general guidance for maintaining and improving the level and quality of urban services as growth occurs in Bend. The citizens and elected officials strive:

- To have public and private utility systems provide adequate levels of service to the public at reasonable cost;
- For the city, county, and special districts to coordinate the provision of adequate urban services in an efficient and timely manner to support urban development;
- For new development to pay its fair share of the cost of major facilities needed to support development;
- To ensure that public services will not negatively impacts on the environment or the community; and
- To locate and operate public buildings and other public facilities to best serve the needs of the residents.

Overview

The Public Facilities and Services chapter describes existing facilities and utilities in Bend and also describes what city facilities are needed to meet projected growth. The listing of city water and sewer projects planned for and expected over the next twenty years provides a framework for decisions on when, where, and how public facilities will be provided to support the projected growth. The city will use the listing of projects as a basis for its annual capital improvement budget.

Sewer Collection Systems Facilities

The City adopted a public facility plan for sewer collection by Ordinance No. 2111 in 2009. The plan was based on the city's 2007 Collection System Master Plan and identifies future improvements to the sewerage collection facilities required to serve

long range growth in Bend. However, the city's 2009 Public Facility Plan adopted by the City Council was never acknowledged by the state.

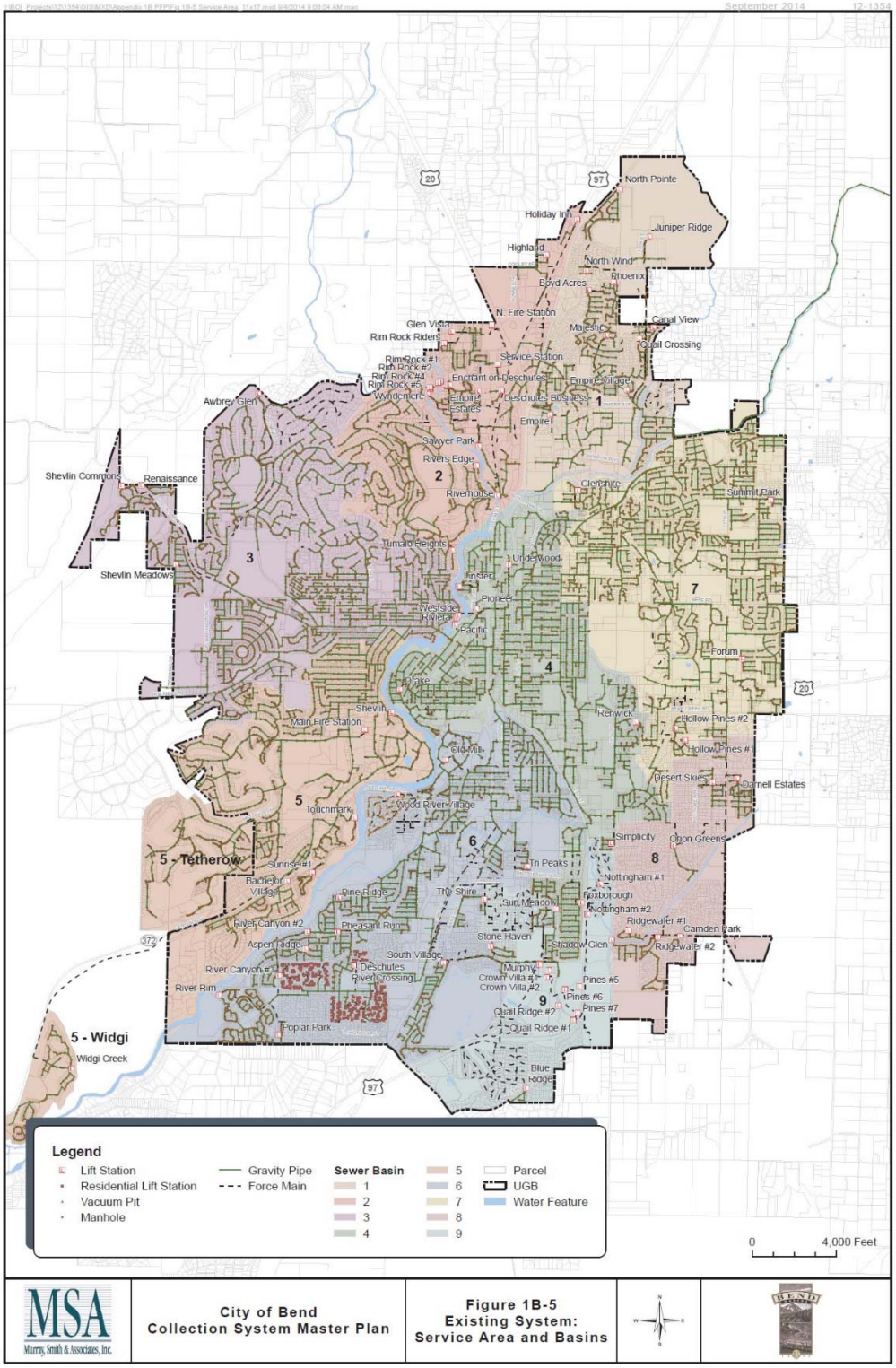
In response to the 2008 UGB Expansion Remand, the City began a comprehensive planning process to update the previous Collection System Master Plan developed in 2007. This planning effort has built on information from the previous master plan, leveraged improvement concepts and utilized system information collected and analyzed in that report. The adopted 2014 Collection System Public Facility Plan replaces the 2009 Public Facility Plan and provides guidance and sound stewardship of the City's sewer collection system for the 2013 – 2033 planning period.

Service Area

The collection system service area includes all areas within the city limits of Bend and the Urban Growth Boundary that are either currently served by the City's wastewater collection system or will be served by the system within the 20-year planning period. To determine the future development projections within the UGB, the City relied upon and applied the adopted Comprehensive Plan designations.

The City's Collection System Public Facility Plan separates the primary collection system into nine major sewer basins covering the approximate 35 square miles of the UGB. These nine major sewer basins are further sub-divided into several smaller sewer sub- basins for the purpose of determining flow capacity. The wastewater analysis and future forecasts consider existing customers, future customers and the conversion of septic to sewer connections within the UGB. There are currently 3,103 residential units and 158 non-residential acres that are served by a County permitted septic system within the UGB. Within the 20-year planning period it is assumed that these residential units and non- residential acres will redevelop and/or connect to the city's collection system.

Figure 8-1 – Municipal System



The City's primary wastewater collection system is generally comprised of manholes, gravity pipelines, City-owned lift stations and force mains that convey sewage to the wasterwater reclamation facility through 249 miles of gravity pipe and 69 miles of force main and pressure sewer pipeline. Most of the gravity collection system was constructed in the late 1970's, when the City received federal funding to construct a centralized wastewater treatment plant. The City completed its sewerage collection system and treatment plant in 1983. Since that time a number of upgrades have occurred in both the plant and collection system. The wastewater treatment plant has capacity for an average flow of approximately seven million gallons a day. Table 8-1 charts the average daily flows at the wastewater treatment plant and shows a gradual increase of the average daily flow. The flow data includes seasonal wet weather events.

Table 8-1
Annual Average Flow from Historical Records at the WRF

Year Average Daily Flow	Year Average Daily Flow
2007	5.41
2008	7.22
2009	5.6
2010	5.5
2011	5.3
2012	5.4
2013	5.91

1) 2007 and 2013 average calculated from flow meter data (2-month period).
2) Suspected error in inflow data at the WWTP. Inflow meter was recalibrated after 7/20/2009.

The master plan for the wastewater reclamation facility (WRF) was completed in 2008 by Carollo Engineering. The plan for the WRF was submitted to the Department of Land Conservation and Development in 2009. The Land Conservation and Development Commission (LCDC) acknowledged the 2008 plan for the WRF through Order 001795 in November 2010. The WRF Master Plan identifies short term and long term capacity improvements that will enable the City of Bend to minimize expansion costs by fully utilizing the existing facilities. The 2014 Collection System Public Facilities Plan proposes improvements to increase the capacity of the collection system to 11.9 MGD within the 20- year planning period. The design of the WRF was completed in 2012, with construction beginning in the summer 2013. The City expects the WRF expansion to be completed by 2016.

Optimization

The City utilized an optimization process to determine the combination of system improvements that would satisfy hydraulic performance criteria and minimize overall life- cycle costs. The optimization model enables an exhaustive and objective evaluation of feasible collection system improvement alternatives. The optimization software, Optimizer WCSTM, is a decision-support software program that integrates improvement alternatives, comprehensive life-cycle costs, design criteria and the calibrated hydraulic model of the collection system. In a single optimization analysis, the software evaluates over 100,000 possible solution configurations and assesses life-cycle cost and hydraulic performance simultaneously while sizing system improvements. Over the course of this

project, over one hundred individual optimization runs were completed, representing a total analysis of more than 10 million trial solutions.

The optimization process identified short-term and long-term capacity upgrade projects to be phased over the 20-year planning period.

Capital Improvement Program
The Capital Improvement Program (CIP) describes proposed improvements that are required in both the short-term (1-5 year) and long-term (6 to 10 years and 11 to 20 years) to provide reliable sewer collection throughout the City's current UGB.

In response to existing and future hydraulic deficiencies, condition deficiencies and other operational issues identified by O&M staff, there are several major projects that the City should undertake in the short-term (1 to 5 years). Below is the list of short-term projects and estimated project cost in 2013 dollars.

1. Southeast Interceptor (SEI) Phase 1 - $19,681,000.
2. Colorado Lift Station - $4,208,000.
3. North Area Improvements - $1,370,000.
4. Plant Interceptor Rehabilitation - $5,400,000.
5. Valhalla Sewer Relocation and Odor Control - $1,616,000.
6. Condition-Related Lift Station Improvements - $5,667,000.

There are also a number of recommended long-term (year 6 through build-out) improvement projects required to support anticipated increases in collection system flow within the existing UGB, provide service to unsewered areas, and to plan for ongoing system repair and replacement. Below are the primary long-term projects and the estimated project costs in 2013 dollars.

Southeast Interceptor, Phase 2 - $8,379,000.
Northeast Interceptor - $15,086,000.
Decommissioning of Lift Stations - $700,000.
Long-Term Repair and Replacement Program $27,070,000.
Local Area Improvements – $5,000,000.
Ongoing Sewer Flow Monitoring, Modeling, and Planning Projects - $1,500,000.

The actual project costs will likely vary from the estimates presented. In addition, the project estimates will change over time due to fluctuations in actual labor and material costs, competitive market conditions, site conditions, final project scope, implementation schedule, continuity of personnel, and other unforeseeable factors. Because of these factors, project feasibility, benefit-to-cost ratios, risks and funding must be carefully reviewed prior to making specific financial decisions or establishing project specific budgets.

Sewer Collection System Financial Strategy
The City's financial strategy for the collection system considers the current and future financial obligations of the utility, operation and maintenance needs, fiscal policy achievement and the ability to support the completion of the capital projects identified in this CSMP update.

The overall goal of the financial plan is to have the annual water reclamation utility total resources (rates and fees) set at a sufficient level to meet annual uses (operations, maintenance, debt service, capital costs and fiscal policy achievement) to ensure a self-supported utility. The primary source of funding for the utility is derived from ongoing monthly charges for service, with additional revenue coming from miscellaneous fees/charges, interest income and system development charges (SDCs). The City Council controls and approves the level of user charges as needed to meet financial objectives. The financial plan considers the total system costs of providing water reclamation services, both operating and capital. The following elements were completed as part of the financial plan:

Capital Funding Plan. Identifies the total Capital Improvement Plan (CIP) funding obligations of the planning period. The plan defines a strategy for funding the CIP including an analysis of available resources from rate revenues, existing reserves, system development charges, debt financing, and any special resources that may be readily available (e.g., grants, developer contributions, etc.). The capital funding plan impacts the financial plan through the use of debt financing (resulting in annual debt service) and the assumed rate revenue available for capital funding.

Operating Forecast. Identifies future annual non-capital costs associated with the operating, maintenance, and administration of the water reclamation system. Included in the financial plan is a reserve analysis that forecasts cash flow and fund balance activity along with testing for satisfaction of actual or recommended minimum fund balance policies. The financial plan ultimately evaluates the sufficiency of utility revenues in meeting all obligations, including cash uses such as operating expenses, debt service, capital outlays, and reserve contributions, as well as any coverage requirements associated with long-term debt. The plan also identifies the future adjustments required to fully fund all utility obligations in the projection period.

The City Council approved a nine percent rate increase effective on October 1, 2014. All monthly rates (monthly rate and volume rate) will increase uniformly by nine percent. Residential customers inside the city will pay a monthly rate of $48.36 per dwelling unit, and residential customers outside the city will pay a monthly rate of $49.82 per dwelling unit. The financial plan indicates that an additional 3.1 percent per year increase will be needed to meet the water reclamation utility rate revenue requirement within the 10-year financial planning horizon.

System Development Charges

SDCs are one-time fees imposed on new and increased development to recover the cost of system facilities needed to serve that growth. An SDC can include two major components:

- A reimbursement fee that reflects the cost of existing infrastructure with capacity that is available to serve growth
- An improvement fee that reflects the portion of the cost of future projects that is attributable to providing capacity for growth.

The financial plan above assumes that the city's sewer SDC remains at its current level of

$2,986 per equivalent dwelling unit. The City has recently initiated an SDC study, which will have a separate public process. That process is expected to begin late 2014 and be complete by June of 2015 and will incorporate all new information contained in this plan to determine the appropriate SDC and its implementation.

Water Facilities and Systems

The quality of water in the Bend urban area is a matter of major importance. Not only is water necessary for the needs of residential, commercial, and industrial users, but it supports many of the recreational and scenic opportunities that make the Bend area a desirable place to live.

In 2006, the city engaged in an update to the water system master plan to serve the existing urban growth boundary, the urban reserve area identified in this plan, and potential areas for future expansion of the UGB. This 2006 master plan followed the development and approval of a water management and conservation plan (WMCP) in 2004. The City relied on these documents, water planning documents from the Avion Water Company and Roats Water Company, and reports from the City Engineer updating information from the 2007 Water Master Plan to develop an updated Goal 11 water public facility plan (PFP) for the existing Bend UGB. This 2013 Water PFP is incorporated as the Goal 11 public facility plan for water and identifies the capital improvements needed to serve the existing and future development within Bend's UGB.

Municipal System

The City of Bend is one of three water suppliers within the UGB. The city's water system in 2006 included about 22,000 service connections. Since 1926, the City of Bend's main source of water has been from Bridge Creek in the Tumalo Creek watershed. Tumalo Creek originates on the eastern slopes of Ball Butte and Broken Top Mountain about 20 miles west of Bend in a protected watershed area, which lies within the Deschutes National Forest. Figure 8-2 shows the annual water use from 1998-2005 in acre feet. Figure 8-3 shows the annual water use pattern, using daily use data from 2005.

The Deschutes Watershed has excellent water quality, considering both chemical and bacteriological quality with only chlorination treatment. The water is a consistent 48°F winter and summer, and is clear with the exception of slight turbidity during period of high runoff from the watershed. These periods occur only occasionally, and last only a few days. The 1986 Safe Drinking Water Act required that all surface water systems in the nation provide filtration unless stringent watershed control, raw water quality and disinfection systems were met. In 1992 the city demonstrated sufficient evidence to meet the criteria, and obtained an exemption from the Surface Water Treatment Rules contained in the 1986 Act. The Bridge Creek source can deliver up to 13.5 million gallons per day. The City supplements the Bridge Creek source with deep groundwater wells. In 2006 the city had 21 wells on line to supplement the Bridge Creek source. These wells increase the delivery capacity of the city system to approximately 36 million gallons per day. In addition, the city has 28.0 million gallons of reservoir storage. The city's 475 miles of water distribution system is primarily composed of ductile iron pipe.

The city water system historically provided metered service for industrial, commercial, and multifamily developments. However, the city was one of the last major water systems in the state to use flat rate (non-metered) billing for residential service

connections. As of December 2004, the City has become fully metered for all customers. This included conversion to automated meter reading technology, as well as installation of premise isolation cross connection protection at every service connection as part of our Safe Drinking Water Program. In 2004, the City updated its required Water Management and Conservation Plan which outlines various conservation related benchmarks, in order to meet conditions by the Oregon Water Resources Department as part of obtaining new water rights to meet the needs of growth.

The city's 2007 Water System Master Plan Update identifies water supply, transmission, and storage needs throughout the city's service territory within the UGB. Additional wells, reservoirs, main transmission lines, and smaller distribution lines will be needed to meet the projected urban area growth.

Figure 8-2

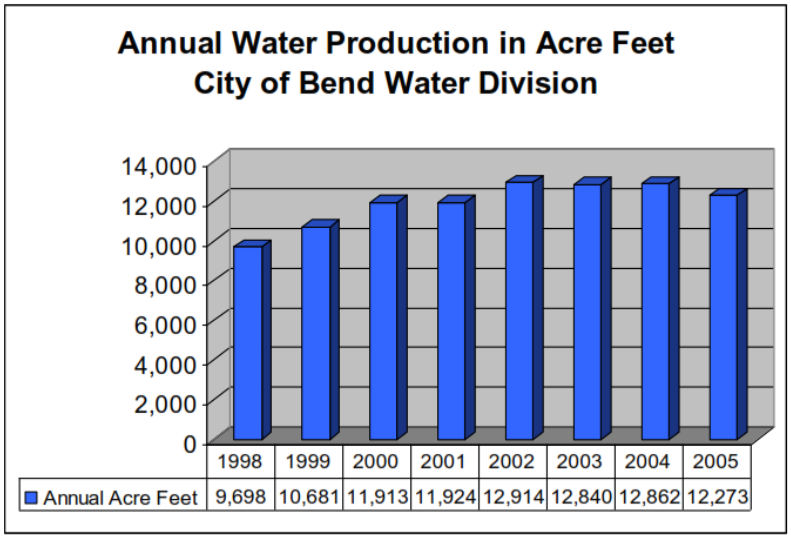


Figure 8-3

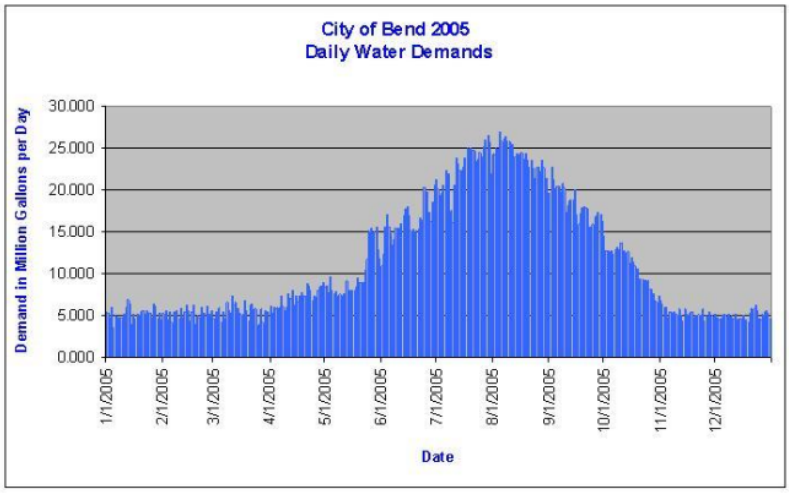
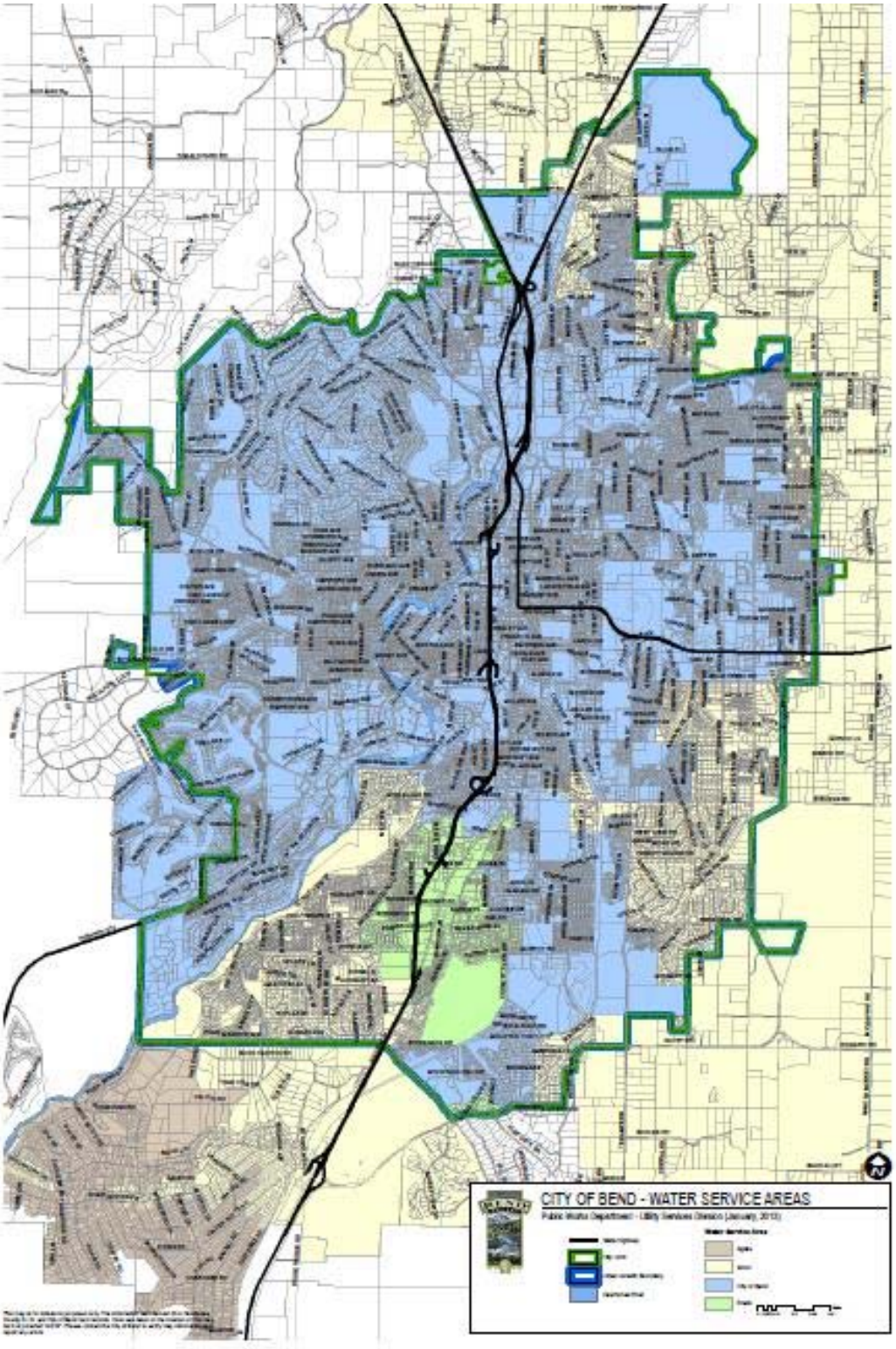


Figure 8-4
Water Utilities in the Bend Urban Growth Boundary



Private Providers
Currently, the City of Bend serves water to approximately 70% of the customers within the UGB. There are two private utilities supplying domestic water to the majority of the remaining customers. Approximately 9,200 service connections within the UGB are furnished domestic water through private water systems. Figure 8-4 shows the extent of both the city's service area (blue) and the private providers; Avion (light yellow or tan) and Roats (green). The City has entered into franchise agreements with Avian Water (See Ordinance NS-1514, as amended) and Roats Water Company (See Ordinance NS-1747) through which the City has agreed to Avion Water Company and Roats Water Company providing water to its customers in the city's boundary. Both franchise agreements have been incorporated into the City Code under Chapter 11, Franchises. In addition, the City's water system has inter-ties with both Avion and Roats, which also have inter-ties between their respective systems.

Water System Financing
Table 8-2 lists the various water improvement projects the city plans to construct through the year 2028 to support the projected growth and land uses in the Bend urban area. The description, location, timing and estimated cost of listed facilities may change as a result of subsequent design studies, capital improvement programs, environmental studies, and changes in funding sources. City facilities may be constructed earlier than planned by an owner/developer choosing to develop an area prior to the scheduled extension or expansion of facilities by the city.

The city has adopted System Development Charges (SDCs), as allowed under state law, to help pay for new facilities. SDCs are levied against all new uses at the time of development. These fees are earmarked for major system improvements identified in the city's 2007 Water System Master Plan Update such as reservoirs, wells, transmission lines, and treatment facilities. As of fiscal year 2006-07, the water System Development Charge is 100 percent of the allowable maximum charge. The City Council determined that this rate reflects the proportionate share of system improvement costs that can be attributed to new growth. The remaining share of system improvement costs benefit the whole community and are collected as a part of the monthly user fees. For more information about short and long term projects for the City's water system please see the 2013 Water Public Facilities Plan.

Storm Drainage Facilities and Systems

For many years, the City of Bend's drainage system has depended primarily on underground injection (dry wells and drill holes) to discharge stormwater into the fractured volcanic rock that underlies much of the City. Dry wells do not work well in areas underlain by layers of impermeable material unless those layers are penetrated. Drill holes are an alternative to dry wells, intended to penetrate impermeable layers to reach more permeable material beneath them.

Bend does not have a city-wide system of pipes collecting and transporting stormwater for treatment. The lack of defined drainage ways, the expense of digging in rock, and the difficult topography have limited the installation of piping. The existing piped system to the Deschutes River is limited to about 14 miles of pipe and 28 river outfalls. There are approximately 4,600 dry wells and 1,000 drill holes on public property in the City

and an unknown number on private property. Including interconnections between inlets and UICs, there are 47 miles of pipe total throughout the City.

Water Quality and Stormwater Management
A large part of Bend's drinking water comes from a deep, very high-quality and abundant aquifer beneath the City that is fed by snow melt high in the Cascade Mountains. The City and its residents are committed to protecting this valuable resource along with protecting surface water quality. Protection of all groundwater including perched water and seasonal high groundwater is required by the State of Oregon. To comply with the regulations for both stormwater and groundwater, the City prepared an Integrated Stormwater Management Plan (ISWMP). The ISWMP is a living document that is updated as necessary to meet requirements of the permits and the needs of the City.

The ISWMP outlines a comprehensive program to protect the quality of the Deschutes River and the City's groundwater. The ISWMP identifies a number of BMPs for preventing pollutants from entering stormwater or removing them before the water is discharged to the river or underground. The following BMPs are required elements of the Phase II (surface water) program:

- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination
- Construction Site Stormwater Management Activities
- Post-Construction Stormwater Management in New Development and Redeveloped Areas
- Pollution Prevention/Good Housekeeping for Municipal Operations

Bend's ISWMP also addresses monitoring and protecting drinking water sources provisions to meet UIC requirements.

In August 2014 the City adopted its first Stormwater Master Plan (SMP). The City relied on these documents and prior planning documents to develop a Goal 11 stormwater public facility plan (PFP) for the existing Bend UGB. This 2014 Stormwater PFP is incorporated as the Goal 11 public facility plan for stormwater and provides a stormwater management strategy and identifies the capital improvements needed to serve the existing and future development within Bend's UGB.

Stormwater Funding Strategy
In 2007 the City Council established a Stormwater Utility Fee for the sole purpose of funding Stormwater infrastructure projects and programs. The SMP provides a cost strategy. The proposed stormwater public improvements have a 20-year capital cost of $25.2 Million. Utility operating revenue needs were modeled to range from $2.5 Million/year at present to $5.4-$5.6 Million/year by FY2032-33 depending on the rate assessment approach taken. Monthly stormwater utility rate increases were estimated in two ways: a gradual rate increase and an accelerated rate increase. The immediate calculated monthly stormwater utility rates were modeled to be between $4.36 and $5.80 per ERU and the FY 2032-33 monthly stormwater utility rates would be anticipated between $6.53 and $6.80 per ERU depending on the rate adjustment approach taken. Below is the City's 2013-2014 Stormwater Budget.

Table 8.2
Stormwater Management Budget for Fiscal Year 2013-2014

Stormwater Management Budget (Fiscal Year 2013-2014):	
Operation and Maintenance	$1,240,000
Engineering and Project Management	$580,700
Capital Improvement Projects	$2,750,000(1)
Water Quality Management	$378,000
Utility Administration & Public Response	$576,000
Total	**$5,524,700**

Note:
(1) Current Capital Improvement Budget is $2,750,000, based on carryover from previous years and an annual budget currently averaging $300,000

Solid Waste Disposal

Solid waste disposal for the urban area occurs at one county facility, the Knott Pit Sanitary Landfill, just outside of the Urban Growth Boundary on the east side of 27th Street. Deschutes County studies estimate that Knott Landfill will reach capacity by the year 2025. However, the recent trend of 10 to 18 percent annual increases in municipal solid waste flows may shorten that life span.

A second landfill just for construction debris and demolition material located adjacent to Simpson Avenue wihin the Urban Growth Boundary was in operation prior to 1997. This demolition landfill site is about 80 acres, and abuts residential lands on the north, and west, and commercial development along its east and south sides.

Collection of solid waste is done by private providers under city and county franchise. In 2005 it was estimated that only about 92 percent of the households in the Bend Urban Growth Boundary had signed up for a weekly collection service. The two garbage haulers in the Bend urban area, Bend Garbage and Cascade Disposal, provide weekly curb-side pickup of municipal solid waste and recyclable materials. Recyclables picked up at curb-side include aluminum, corrugated cardboard, paper bags, magazines and catalogs, and used motor oil.

The Department of Environmental Quality's 2005 Waste Diversion Report indicated that 160,707 tons of waste were deposited in Knott Landfill and 62,523 tons of waste were "diverted" (recycled by households and businesses either through curb-side service, or dropped off at the county's yard debris mulch program, as well as recycling occurring out of the solid waste system such as bottle bill returns and the scrap metal industry). When backyard composting and efforts in waste prevention and reuse are considered, the percentage of solid waste material being recycled increases from approximately 28 percent to approximately 34 percent.

Other Urban Utilities

Electricity within the urban area is provided by Pacific Power and Central Electric Cooperative. Cascade Natural Gas Company provides natural gas service to most parts of the urban area. Adequate electric natural gas resources exist to serve the Bend urban area through the planning period.

Local (land-line) telecommunication services are provided by Qwest. Many private companies compete to provide long distance and cellular phone service. Cable television service within the urban area is provided by Bendbroadband, which also provides phone and high-speed internet service. Private utility providers within the city limits operate under non-exclusive franchise agreements with the city.

Public Buildings and Facilities

Downtown Facilities

The Bend City Hall at the south end of downtown was built in 1989 and expanded in 1992. City Hall comprises an area of approximately 26,000 square feet. Also located at the south end of downtown are the Bend-La Pine School District Administrative offices, the Deschutes County historical museum, the Bend Public library, and other public buildings.

The County courthouse and various County offices are located in several buildings at the north end of the downtown area. A new 80,000 square foot administration building was constructed in 2004. Half of this facility is leased to the State Department of Human Services and Department of Justice.
The Bend Metro Parks and Recreation District offices are located between the Old Mill District and the Deschutes River.

Fire Department Facilities

The Bend Fire Department serves the city, the urban area, and some areas beyond the Urban Growth Boundary through the Rural Fire District service contract. The Bend Fire Department covers approximately 164 square miles for fire protection and 1,450 square miles for ambulance operations. The “Main Station” (Old Station 301) was built in 1920 and was located downtown at 5 NW Minnesota Avenue. After serving the Bend Fire Department as the main station and the administrative office for 80 years, the department moved out of the station in 2000 to its new location at 1212 SW Simpson Avenue in order to provide better, faster coverage for the community. Old Station 301 was remodeled and became a mixed-use facility including dining, retail, office and residential spaces. The Fire Administration Building at 1212 SW Simpson Avenue was constructed in 2000. It houses the department administrative, prevention and support staff. The “West Station” (Station 301) is also located at 1212 SW Simpson Avenue, on the west side of Bend near Century
Drive. The station is 12,000 square feet in size and was built for a cost of $1.6 million in 2000. The “Tumalo Station” (Station 302) is located at 19850 4th Street in the unincorporated community of Tumalo, between Bend and Sisters. The station was built in the early 1970s. The “South Station” (Station 303) at 61080 County Club Drive was also built in 2000. The “East Station” (Station 304) at 62420 Hamby Road was built in 2003 and is the newest station. The “North Station” (Station 305) at 63377 Jamison Street was built in 2000 and is located on a seven-acre parcel next to the Deschutes

County Sheriff's Office. Located behind Station 305, the department Training Center includes a five-story tower with attached garage, numerous training props, and a driver training area. The Training Center also features a classroom and training office building located near the tower. The Fire Department is planning on building a "Central Station" on the Pilot Butte City Campus within the next ten years in order to better serve the rapidly growing central- east section of Bend.

Law Enforcement Facilities

Law Enforcement services in the urban area are provided by the City of Bend Police Department and the Deschutes County Sheriff's Department. The Oregon State Police regional headquarters is also located in Bend. The City of Bend Police Department was located in City Hall until 2002, when a new 27,000 square foot building was constructed at the intersection of 15th Street and US Highway 20 to better accommodate and headquarter all police business. As with all other departments at the City, faster than anticipated growth has created a need for additional staff to serve the community and this has, in turn, created the need for additional space. As a result, the Police Building was expanded to include another 19,000 square feet, and now also houses the Bend Municipal Court.

In 1997, Deschutes County constructed a new public safety complex off of Highway 20. Within this complex there is a 228-bed adult jail, the Sheriff's Office, the Adult Parole and Probation offices and transitional housing. The County also constructed the Health and Human Services building off 27th Street on the east side of Bend. This building provides space for the County's Mental Health and Health Departments.

Public Works Facilities

The City's Public Works Facilities are located in three primary areas: The Pilot Butte Campus Site, which is located west of 15th Street between Highway 20 and Bear Creek Road, the Boyd Acres offices, and the Water Reclamation site, which is located northwest of the Bend Airport on McGrath Road. Numerous additional satellite facilities that house vehicles, utility equipment or materials are located throughout the service area.

The Pilot Butte City Campus site houses Public Works administration and all departmental divisions except Water Reclamation. City Council authorized a substantial master planning effort for this site in 2006 in order to determine space needs for the next twenty years for the Public Works, Police, Community Development and Fire Departments, all of whom will have facilities on the site.

The existing main Public Works building houses Public Works administration and provides crew spaces for the Street and Water Divisions. This 41,000 square foot building will likely undergo significant, phased-in changes in the next seven years in order to bring the building into Code and ADA compliance as well as provide for the anticipated 20 year needs of the department.

A new facility to house Public Transportation operations was recently constructed, at the southwest corner of the Pilot Butte Campus site. The construction was largely funded through a $4 million *ConnectOregon* grant, and includes a 5,500 square foot transit operations office, five vehicle maintenance bays and space for transit vehicle parking. The City's public transit program is operated by Cascade East Transit through

Central Oregon Intergovernmental Council. The transfer of this program to COIC began in 2010 and was completed in 2011.

The Water Reclamation facility is located outside of the UGB on 1,600 acres northeast of Bend and includes eight main structures. A new Headworks building was constructed in 2008. This facility will be heated by hot water that is heated by methane gas captured from the waste products entering the facility. New facilities completed within the last five years include a new training building, a Level IV filtration facility and a new digester. The new facilities plan for the plant was completed in 2008, and acknowledged by the Land Conservation and Development in 2010. This plan provides for an expansion and upgrade plan for water reclamation to serve the City up to the year 2030.

The Bend Airport

The Bend Municipal Airport is located on 415 acres situated five miles east of the city limits of Bend. Owned by the City of Bend, the airport is located in Deschutes County and is currently outside the Bend Urban Growth Boundary. Airport facilities consist of a single instrument capable runway, 5005 feet in length, a full parallel taxiway, more than 60 hangar and industrial buildings, and parking facilities for aircraft and vehicles. The Bend Municipal Airport is identified by the Oregon Department of Aviation as a Category 2, High Activity Business/General Aviation airport, with approximately 200 based aircraft and an estimated 42,000 operations in 2005.

Over the past few years, demand at the Bend Airport has increased significantly. Continued business expansion by the existing tenants, the addition of Epic Aircraft in 2005, and continued growth and demand has wrought a dramatic increase in activity at the Airport. The corresponding demand for new services and facilities provides challenges to current funding levels.

Current improvements to the Airport infrastructure include the relocation of the single runway at the Airport to meet federal design standards and provide an adequate surface for the existing aircraft fleet mix. This project, beginning in 2007, is scheduled for completion in 2008. Following the runway relocation project, development of an eastside parallel taxiway will be planned for construction in 2009, with completion scheduled for the same year. At this time, it is anticipated that a new Airport Master Plan to clarify the future direction of the Airport and to meet future user needs will be initiated.

Policies

Sewer Collection Facilities

8-1 All new development within the City Limits should be connected to City sewer.

8-2 The city is the primary provider of sewage collection and treatment services for the City's service area under Statewide Planning Goal 11.

8-3 To reduce the reliance on individual sewage disposal systems within the Urban Growth Boundary the city will work with

unsewered neighborhoods to find solutions for sewer service.

8-4 The city should collect a sufficient amount of revenue to allow the creation of capital project reserves and to replace aging infrastructure in addition to operational needs of the utility.

8-5 Staff should report to Council on an annual basis regarding the status of the Collection System Master Plan, Capital Improvement Projects and capacity issues within the collection system.

8-6 The City will annually update its financial model as part of the review of sewer rates and report to Council on any changes in the 20-year financial outlook and subsequent rate impacts.

8-7 The master plan shall be updated at least every 5 years with official review and adoption by Council.

8-8 The preference of the City is to serve development through gravity conveyance and use of the Water Reclamation Facility.

8-9 If lift stations are required to serve new development, regional pump stations shall be relied upon to the extent practicable versus individual or smaller lift stations.

8-10 These policies will be implemented through the City of Bend Public Improvement Construction Procedure Standards & Specifications.

8-11 The City should look for reasonable opportunities to decommission energy- and maintenance-intensive lift stations as part of new development or other City infrastructure projects.

8-12 The City will consider the conservation and water reuse measures in the Water Management and Conservation Plan in infrastructure planning to reduce overall impacts to the sewer collection and treatment system.

Water Facilities and Systems

8-13 The City of Bend is the provider of water service for the City's service area under Statewide Planning Goal 11

8-14 Avion Water Company is the provider of water service for its franchise area under Statewide Planning Goal 11 and pursuant to the franchise agreement between the City and Avion adopted under Ordinance NS 1514, as amended.

8-15 Roats Water Company is the provider of water service for its franchise area under Statewide Planning Goal 11 and pursuant to the franchise agreement between the City and Roats adopted under Ordinance NS 1747.

8-16 Within the urban planning area, public and private water systems shall be consistent with City Standards and Specifications for construction and service capabilities.

8-17 The City shall continue to coordinate with private providers and irrigation districts in matters of water concerns within the Urban Growth Boundary.

8-18 The City shall continue to implement a water conservation program that emphasizes education, enforcement, metering, and other methods to use water efficiently.

8-19 The City may allow water service outside the UGB at rural levels consistent with Goal 11.

Storm Drainage Facilities and Systems

8-20 The City of Bend is the stormwater utility for the city limits and urban growth boundary. As the utility, the City shall review its Stormwater Master Plan and Integrated Stormwater Management Plan as needed for compliance with changes in state or federal requirements and at least every five years.

8-21 The City will initiate funding options (e.g., SDCs, grants, low-income loans) for stormwater capital projects in accordance with applicable laws.

8-22 Due to the lack of a defined drainage pattern for most of the urban area, development shall, to the extent practicable, contain and treat storm drainage on- site. In instances where containing storm drainage on-site would not be safe or practicable, the developer shall enter into a formal and recorded arrangement with the City or a private party to adequately address the storm drainage off site such as a regional control.

8-23 The use of stormwater disposal systems shall be coordinated with the Oregon Department of Environmental Quality and Water Resources Department to protect ground water and surface water.

8-24 The City shall work to minimize the discharge of untreated stormwater run-off from streets directly into the Deschutes River and Tumalo Creek.

8-25 All public and private stormwater facilities shall be designed and operated in accordance with the City's Stormwater Master Plan and shall meet appropriate drainage quantity and quality requirements, including, but not limited to, the requirements of the City's National Pollutant Discharge Elimination System (NPDES) MS4 Stormwater

Permit, Integrated Stormwater Management Plan, WPCF UIC Permit and any applicable Total Maximum Daily Load requirements (TDML) requirements. Underground injection and surface discharges to the Deschutes River or Tumalo Creek shall only be approved when other alternatives, such as retention basins or bioinfiltration swales, are not reasonably available. Low impact site designs shall be a required part of all new development and redevelopment projects.

8-26 The ability to provide stormwater facilities for developments proposed for annexation into the City shall be a consideration for annexation approval.

8-27 The City shall reduce the quantity of runoff and discharge of pollutants to the maximum extent practicable by integrating stormwater runoff controls into new development and redevelopment land use decisions. Controls may be required to minimize illicit discharges or pollutants of concern.

8-28 The City shall implement and enforce requirements for an erosion and sediment control program for public and private construction and post-construction activities.

8-29 All developments shall evaluate the potential of a land parcel to detain excess stormwater runoff and require incorporation of appropriate controls, for example through the use of detention facilities to address quantity, flow, and quality concerns.

8-30. The City shall seek efficiencies and consistency by working with other municipalities and stakeholders within Central Oregon on land use issues to address flood control, watershed health and stormwater pollution prevention.

8-31 Hazard and resource areas with the following characteristics shall be considered unsuitable for urban development:

- flood zones;
- water supply watersheds; and
- riparian corridors and natural drainageways.

8-32 Development on slopes in excess of 10 percent shall require special consideration to prevent construction-related and post-construction erosion.

8-33 The City shall regulate development near water courses to reduce erosion and pollution and to provide open, natural areas.

8-34 Land uses that pose a major threat to water quality, including commercial and industrial uses such as automobile dismantlers,

waste transfer disposal facilities, light industries, and other uses that have a significant potential for pollution, shall not be located within the vicinity of stream, percolation facilities, reservoirs, drill holes or where pollutants could easily come in contact with flood waters, high groundwater, flowing rivers, or reservoirs. Such uses shall be required to reduce any threat of pollution to an insignificant level as a condition of approval.

8-35 As part of site approval, or as a condition on tentative maps, as necessary, the City shall require permanent stormwater pollution control site design or treatment measures or systems and an ongoing method of maintenance over the life of the project.

8-36 The City shall minimize particulate matter pollution through controls over new and redevelopment (including erosion and sediment controls on grading, quarrying, vegetation removal, construction, and demolition), industrial processes, parking lots and other activities that pose a threat to water quality.

8-37 The City shall require the following stormwater protection measures for all new development and redevelopment proposals during the planning, project review, and permitting processes:

- Submit geotechnical site assessments when dry wells or other infiltration or injection systems are proposed.
- Avoid conversion of areas particularly susceptible to erosion and sediment loss (e.g., steep slopes) or establish development guidance that identifies these areas and protects them from erosion and sediment loss.
- Retain natural drainage channels in their natural state to prevent undue erosion of banks or beds, and preserve or restore areas that provide water
- quality or quantity benefits and/or are necessary to maintain riparian and aquatic biota.
- Promote site development that limits impacts on, and protects the natural integrity of topography, drainage systems, and water bodies.
- Promote integration of stormwater quality protection into construction and post-construction activities at all development and redevelopment sites.

8-38 The City shall work to reduce transportation-related sources of water pollution, particularly in stormwater pollution. Any means and actions that result in a reduction in vehicle-miles-traveled would benefit congestion and reduce both air and water pollution.

8-39 The City shall recognize and publicize the relationship between air pollution and water pollution in the deposition of airborne contaminants, including metals and fine particulate matter onto streets and other surfaces.

8-40 To minimize illicit discharge to stormwater and groundwater from septic systems, the City shall require lots with onsite sewage disposal to connect to the city sanitary sewer whenever state rules governing connection are met.

Solid Waste Disposal

8-41 The city and county shall encourage recycling beyond the level required by state law as an alternative to landfill disposal.

8-42 The county shall reduce dust and blowing refuse at the landfills in order to ensure as few adverse impacts as possible from these facilities.

8-43 The city shall explore methods, including mandatory garbage service, to gain 100 percent disposal of waste at designated landfill sites and discourage the dumping of wastes on public and private lands.

8-44 The City shall coordinate with Deschutes County on the creation of a new solid waste management plan.

Public Buildings and Facilities

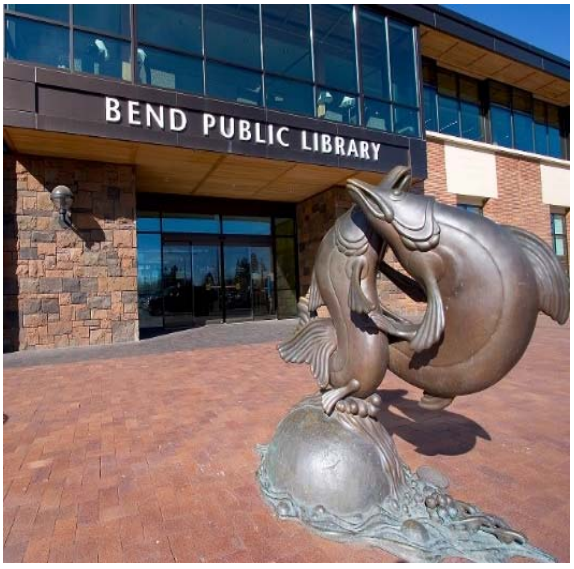
8-45 Public buildings and facilities shall be located so as to provide convenient public use and to provide maximum service for the greatest economy. Governmental offices should locate downtown when practicable. Other governmental facilities, reservoirs, landfills and correctional facilities should be located in areas with good public access to principal streets.

8-46 The County Public Works facility shall be planned and zoned with a Public Facilities designation. The uses allowed at the site from among those uses listed in a Public Facility zone shall be limited to public works and transportation facilities and yards and public service uses in existing facilities as such facilities may be expanded and accessory uses thereto. Commercial or manufacturing uses shall not be allowed at this site.

General Policies

8-47 The City may consider funding mechanisms and agreements to address on-site and off-site improvements, modernization of existing infrastructure to City's standards and specifications, and impacts to infrastructure inside the current City limits.

Chapter 9: Community Appearance



Adopted Amendments

EFFECTIVE DATE	ORD #	CHANGES
November 18, 1998	Resolution #2247	Comprehensive Plan Update
2016	NS-2271	Format update, minor text changes to remove outdated text

BACKGROUND

Context

One of the hallmarks of the nation's best communities is the thought, planning and community involvement put into creating and delineating an attractively built environment that relates to and incorporates the area's natural environment. A basic objective of this Plan is to retain and, where required, re-establish a sense of community in Bend as growth occurs.

An important step in achieving this objective involves paying more attention to the overall appearance of the community and promoting better designs for all types of development. This step benefits the residents by creating a more visually attractive community, and can in some areas, such as along the main highways and transportation corridors, create the image of Bend for visitors and other Central Oregon residents.

Goals

The purpose of including a community appearance section and policies in the *Comprehensive Plan* is to provide direction to significantly improve the appearance of the entire community, and especially in those high visibility areas along the commercial corridors. The community appearance section of this Plan has therefore been prepared in conformance with the following general goals:

- To make a concerted effort to improve the appearance of the community, particularly in the commercial, industrial and multifamily areas;
- To initiate community action programs for the purposes of developing an awareness in the community's citizens of appearance-related issues, evaluating community appearance and developing specific improvement programs;
- To identify those characteristics that give the community its individual identity and to preserve and expand those characteristics as growth occurs; and
- To significantly improve the appearance along the state highways and other transportation corridors as one means of recapturing the individual and distinct identity of the Bend area.

Overview

Since the early 1970s Bend has had growth rates well in excess of the state average, and this trend is expected to continue into the first decade of the 21st century. The rapid growth has had an enormous impact on the physical character of the community, and has frequently resulted in a significant loss of the physical qualities that make Bend a unique and attractive place to live.

Simultaneous with this growth, a deliberate and continuous effort is necessary to see that the thousands of individual decisions made in the process of development collectively constitute tangible progress towards retaining and re-establishing the livability and appearance of our community.

The appearance of a community is a complex planning issue that involves both general concerns relating to categories of developments, and specific concerns about areas with high visibility and public use. These concerns are described under several categories in the remainder of this chapter.

Residential Areas

The residential areas of Bend are generally among the most attractive and pleasant sections in the city. The city and county are developing new subdivision and other land development standards to ensure that future residential developments continue the tradition of quality that currently exists. Care should be taken to make certain that older residential neighborhoods retain their charm and vitality and do not enter into decline.

One of the major challenges facing the community is to ensure that new housing developing at the edge of the community or as "in-fill" projects within neighborhoods is well planned and integrated within the larger context of the community. Future subdivisions will have a more thoughtful design that works with the land and with the surrounding neighborhoods. Natural topography, foliage and rock outcroppings should be preserved and used to create character within developments rather than eliminated, and grading should be kept to a minimum. Naturally occurring open space, parks and greenbelts provide visual relief for residents and can link a developing residential area to an established one.

Commercial Areas

Outside of downtown, the commercial sections of the community generally show a lack of order and relationship between buildings and their sites. Although commercial areas make up only about three percent of the urban land area, they are often along the most frequently traveled routes and have a strong influence on the "look" of Bend. The development of automobile oriented businesses along the highways, coupled with the increase in national food, gasoline, and retail chains, have done more to set the current image of Bend than any other single factor.

If the overall community appearance is to improve, it is important that the businesses within the commercial districts and local governments work together to improve the site design, building design, landscaping, signs and interconnections between properties. Several design considerations, examples of which are presented below, can improve the appearance of a development and keep it more competitive as Bend's commercial sector becomes more sophisticated:

- distributing parking around buildings so the building, not the parking lot, is the main focus of the site;
- using building designs that reflect the regional setting and native materials such as rock and wood in the exterior;
- designing large structures so they blend in better with a more human scale and charm of Bend's older commercial areas;
- incorporating natural features of the site into the landscape plans, and maintaining the landscape areas; and

- integrating signs into the overall design of a site rather than relying solely on large signs to attract attention.

Other structures that have an impact on the appearance of the commercial corridors are the electric power transmission and distribution lines. Most of the corridors have wooden poles, but larger and taller rust-colored metal poles for high voltage lines have been erected along Highway 97 South and the parts of the Parkway. In addition to the visual impact of the poles themselves, other utility lines for local power, telephones, and cable are also hung on these poles below the electric transmission lines thereby creating a ladder effect of lines and visual clutter. Eliminating or relocating the system of above ground utility poles and cables along the commercial corridors will improve the appearance of the commercial areas.

Industrial Areas

Bend is known for both the high quality of its work force and the goods that are produced in the area. With the exception of Shevlin Center, most industrial areas do not have a consistent development standard so there is much variation from site to site.

Although a few industrial operations do not lend themselves to significant building or site design changes, improvements to the appearance of most industrial operations would be beneficial to the community. First, since these are places where workers spend about half of their waking hours, improving the buildings and grounds would make them more pleasant places in which to work and take breaks. Second, given that the "clean" high-tech industries the city is trying to attract usually locate in pleasant, well landscaped campuses, the city and county need to develop new standards to ensure that new industrial areas meet the expectations of new businesses. Third, improving the appearance of industrial areas will create a more pleasing visual environment for community residents and visitors.

Deschutes River Corridor

The Deschutes River has long been an important element of the appearance and quality of life in Bend. The city and county have adopted regulations to protect this priceless resource and promote good design as the community grows. A Design Review overlay zone applies to all development within 100 feet of the river, and the Mixed-use Riverfront zone guides the redevelopment of land along the historic "Farewell Bend" portion of the river.

Transportation Corridors

Improving the appearance of the community also requires better, more thoughtful designs of the transportation corridors that serve the community. Streets in the community that are commonly recognized for their good design — and also function well for all transportation modes — are those that are designed with planter strips between the sidewalk and roadway and with a planted median strip. The Bend Parkway incorporates a planted median strip in its design, and city engineers have developed standards for including planted medians in the major arterial and collector streets.

The addition of landscaped medians along the major transportation corridors will help control traffic and prevent accidents, and will also help create a more attractive

community by softening the appearance of areas that are currently completely dominated by man-made surfaces. Traffic signs, street lighting and street signs should be integrated into one structure to help eliminate confusing and hazardous visual clutter at intersections. The city and county will continue to work with the state highway department to find alternatives to the old style traffic signals that hang from wires and dangle over state highways.

Site Planning and Design

Thoughtfully planning the location of structures, parking, service areas, walkways and amenities has a marked impact on the overall appearance of an area. Well-planned sites that are carefully integrated with neighboring areas have a powerful impact upon the function and attractiveness of their entire neighborhood.

To recapture some of the human-scale, small town ambiance that for many years was Bend, much of the recent pattern and trends in site planning will need to be reversed. The pattern of buildings surrounded by acres of parking and set back away from the public street should be modified so that additional buildings on development "pads" or buildings on new sites are placed closer to the front property line and have a main entrance oriented to the street and sidewalk.

Interrelated to building siting, pedestrian walkways from both sidewalks and parking lots should be provided for safety and to help reestablish the desirability of pedestrian travel. These walkways should be pleasant to use and incorporate landscaping, drop-off bays, bicycle facilities and other non-automobile related amenities. They should be designed in such a manner that they are logical extensions of walkways on adjoining sites, and complement established urban and bicycle trails.

Community amenities such as patio/seating areas, water features, artwork or sculpture, clock towers, pedestrian-oriented plazas with park benches or other features should be located adjacent to the primary entrances of buildings to help facilitate pedestrian meeting spaces and to provide places of
refuge from parking areas. These amenities should be scaled to the size of their development and should be required for larger developments. The inclusion of community amenities helps to create attractive public spaces and reinforces the importance of a human-scaled environment.

Site grading should be held to a minimum, and new developments should work within the parameters of existing topography in order to create a natural looking setting. Natural features and areas of special interest must be protected during construction and incorporated into the overall project design.

Landscaping

Attractive, well maintained landscaping can make an enormous difference in improving the appearance of an area. Landscaping should be integrated into the overall design of the site and structure and should reflect an understanding of how plant selection and placement can moderate and enhance a site. Large parking lots should be divided into areas, with each area surrounded by landscaped beds. Pedestrian walkways should be integrated into the landscaped areas, and trees should be required in parking areas to create a canopy over the majority of the paved areas.

Bend's short growing season and rocky ground make it difficult for trees and shrubs to acclimate or grow quickly. Because of that, the use of large trees and shrubs that are native to Central Oregon is encouraged. These plantings also tend to be disease resistant and low maintenance, which make them especially suitable for commercial and industrial developments. This type of landscaping, combined with existing natural features on a site, can produce an especially pleasant environment that fits into the natural setting.

Architecture

During the first 60 years of Bend's existence, the structures that were built here reflected the scale of the town and were largely composed of the natural resources available within the region. Although a variety of styles were used, the resulting mix never detracted from the small town feel. The area has grown threefold since the 1970s, and most of the featureless building designs that could be from "anywhere USA" have occurred during the last 30 years of the century. This trend was emphasized in the 1990s as large, national retail chains moved to Bend.

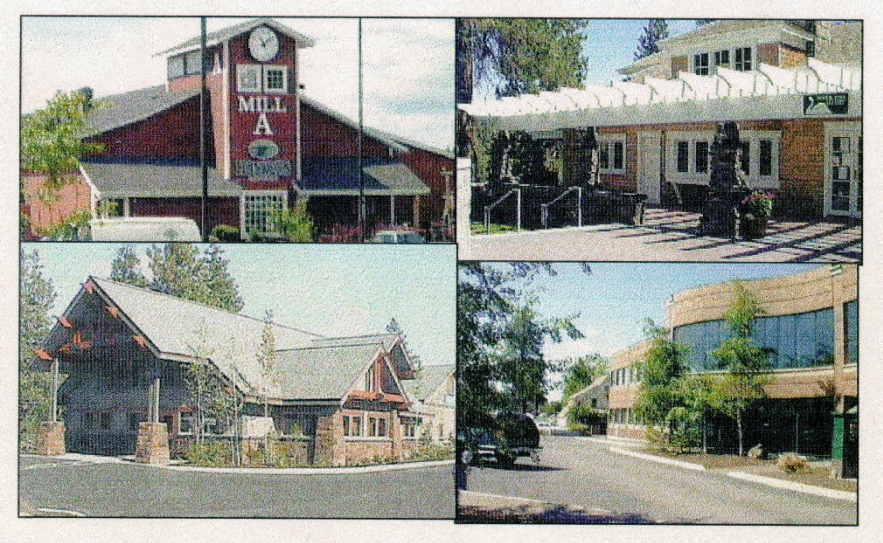


Figure 9-1 Examples of Commercial Buildings

Yet in spite of this, people remain attracted to Bend largely because of its original character, and have expressed a strong desire for new development in the town to be respectful of and, to some degree, express its original small town roots in the design of new structures. In order to accomplish this, structures need to be evaluated in terms of several components, including exterior design, wall articulation, building materials and roof design.

Bend does not have a history that allows it to claim a particular architectural style as indigenous; however all existing styles here were designed to what is termed "human scale." Structures were small to moderate in scale and incorporated architectural details and elements for interest. Although it is unrealistic to ever expect a complete return to the designs of the past, large structures should be designed so that their impact is more consistent with the scale of commercial buildings in Bend. Specifically:

- walls on large buildings should be broken into smaller scale elements and articulated with architectural features appropriate to the chosen design;
- landscaping should also be incorporated along large walls to further break up the impact of large structural planes;

- main entrances should be clearly defined and highly visible, again using architectural features to enhance their design;
- roofs should be designed to be integral with and appropriate to the overall architectural style of a structure. On large buildings, they should be designed to reduce the apparent exterior mass of the building. Variations within one architectural style are desirable, as are overhangs and other shadow-producing elements;
- the predominant building materials used on building exteriors should be materials that are characteristic of Central Oregon. These include brick, wood, native stone, textured concrete masonry units, and traditional glass products. Other materials should only be used as accents and be architecturally appropriate to a specific design. Building colors should be subtle, neutral or earth tone colors that reflect their natural setting; and
- exterior lighting should be shielded, directed down onto the site and confined to the site. Light poles, light fixtures, flag poles and similar structures should be limited in height.

Business and Directional Signs

If Bend is to retain the character and quality that originally made it one of the most attractive communities in Oregon, a major effort must be made to improve the appearance of business signs and public signs along its roadways.

Figure 9-2. Examples of Bend wall mounted and ground signs

Apart from the national chains, the type, size and location of business identification signs are seldom considered in the overall design of a site. The most attractive and typically the most effective signs are those that are designed to fit in with the building and site. These signs are memorable and effective because they carry through with the building theme and are not just another pole sign placed at the edge of the site just above or below the adjacent business sign.

The large number of businesses along the main transportation corridors, combined with the ever-increasing competition to catch a driver's attention, has created a forest of pole signs. Currently, principal business signs are accompanied by many lesser message signs relating to credit cards, prices, specials, hours of operation and so forth.

A second category of signs are directional and information signs. These signs, most of which are public signs in the street right-of-way, guide visitors and the motoring public to parks, the mountains, the college, and numerous other sites. Sign clutter so completely dominates the landscape of the major commercial arterials that the individual effectiveness of each sign is minimized, thereby defeating the purpose of signs.

Billboards and other "off-premise" signs are a third category of signs. These signs are most often used to advertise a product, business, or high-end housing development, or used as a directory sign, but also may provide community service information. Because they are targeted at the motoring public, they are most prominent along the state highways and main arterial streets in town. Billboards frequently compete with the on-site business signs and add to the sign clutter, which is contrary to the goal of improving the appearance of the commercial corridors. The city and county should review the local billboard regulations as part of their overall review and upgrading of the city and county sign codes.

As community concerns increase about the appearance of the transportation corridors and the neighborhoods, new, more thoughtful sign regulations must be developed. Sign regulations should be adopted that would not only control new signs, but establish a reasonable amortization period for the removal of existing non-complying signs.

Conclusion

If the appearance of the community is to be reestablished and improved, local citizens must be involved in programs that effectively evaluate community appearance and develop programs for its improvement. Additionally, the city and county must act upon the citizens' wishes by enacting regulations that will effectively direct future development and redevelopment in a manner that is consistent with the historic patterns and aesthetic values of the community. Continued efforts by local government and its citizens can preserve and enhance the natural beauty and livability of the area and, in time, create a city that is truly worthy of its spectacular setting.

Policies

9-1 The city, county, and special districts shall publicly advocate and coordinate activities relating to beautification and landscaping throughout the community. Unless otherwise agreed, each agency shall be responsible for improving the appearance of its own properties.

9-2 Community appearance shall continue to be a major concern and the subject of a major effort in the area. Major natural features, such as rock outcrops or stands of trees, should be preserved as a community asset as the area develops.

9-3 The city will use advisory committees, public workshops, and other measures, to identify those characteristics that give the community its individual identity and preserve and expand those characteristics as growth occurs.

9-4 Sign regulations should limit the size, location, and number of signs in residential, mixed-use, commercial, institutional and industrial areas and have amortization provisions to remove non-conforming signs within a reasonable period of time.

9-5 Special design and landscaping requirements shall be established along streets that include, but not be limited to Highway 20 West; Highway 97 and 3rd Street; Greenwood Avenue and Highway 20 East; Franklin Avenue; Riverside Avenue opposite Drake Park; Newport Avenue; Galveston Avenue from the river to 14th Street; Century Drive to the Deschutes National Forest boundary; Reed Market Road; NE 27th Street from Reed Market Road to Butler Market Road; and Mt. Washington Drive.

9-6 The city shall develop designs for arterial and collector streets that include landscaped planter strips and medians. Such designs shall include trees in the planter and median strips when practical and safe.

9-7 Special design consideration shall be given to development on hillside areas visible from developed areas, and from Highway 20 and the Parkway within the Bend area.

9-8 The city values design review for all development in the community with the exception of single-family houses, duplexes and tri-plexes.

9-9 The city shall seek opportunities to relocate existing overhead utility lines underground in all parts of the community, and especially along the commercial corridors.

9-10 The city shall develop an Urban Forestry Plan which shall include:

- annual tree planting plans for existing areas of the community;
- a city approved street tree list;
- steps to re-capture and maintain a “tree-city USA” designation; and
- the adoption of a formal Bend City Tree Ordinance which includes regulating the removal of trees on commercial and industrial land and during residential subdivision development.

Chapter 10: Natural Forces

Adopted Amendments

EFFECTIVE DATE	ORD #	CHANGES
November 1998	Resolution #2247	Comprehensive Plan Update
2016	NS-2271	Format update, minor text changes to remove outdated text

BACKGROUND

Context

The natural forces that have formed the physical environment of the Bend Urban Area continue to provide the area with many benefits: a moderate climate, clean air and water, plentiful stream flows and ground water, and natural energy resources from the sun, water, and geothermal energy. The Plan and related ordinances shall reflect the interest of the community to retain and enhance the quality and availability of these resources.

Goals

Natural forces such as the quality of the air, the energy of the sun, and the power smoldering deep under the lava flows are characteristic of Central Oregon. The local governments and community residents must work together to ensure these natural forces are not diminished. In support of this effort the Plan has the following goals:

- to maintain or improve the air quality for a healthful and desirable urban environment;
- to encourage energy conservation and the development of energy producing facilities that use renewable resources; and
- to work with state and federal agencies to develop new, more accurate mapping data on flood plains, faults, and other local natural hazards within the urban areas.

Overview

This final chapter in the Bend Comprehensive Plan provides discussion and data on natural forces — air quality, energy sources and conservation, and potential hazards such as flooding and land faults. Land use planning can have some influence on how future development impacts these natural forces. However, the effect of these forces on the growth and livability of the urban area is equally likely to be driven by factors that are beyond the physical and political control of the city or county.

Air Quality

Maintaining and improving the air quality in the area is an important part of keeping Bend a desirable place to live. Bend is fortunate that local governments, citizens' groups, and the Oregon Department of Environmental Quality are working together to ensure that Central Oregon's sky remains blue and clear, and our citizens remain healthy without concerns of air pollution. Policies at the end of this chapter provide direction for local actions to reduce air pollution.

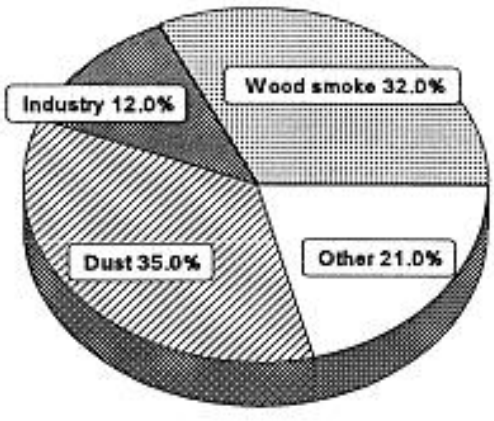
Both the federal and state government establish air quality standards for various pollutants, and may impose strict and costly control measures for communities that

exceed the standards. In Bend, the two air pollutants that are of concern and monitored on a regular basis are carbon monoxide (CO) and very small particulate matter (PM10). Automobile exhaust and other incomplete combustion are typical sources of CO production. Bend has exceeded the CO standards twice since 1987, and both occurrences were in 1987.

A variety of materials such as wind-blown dust, field and slash burning, wood stove smoke, and road cinders used for winter sanding can produce fine particles that fall into the PM10 air pollution category. Figure 10-1 shows PM10 emission sources measured during the winter of 1994-5. The PM10 air quality standard has been exceeded twice since 1987, most recently in the winter of 1996. A new particular matter standard is being established by the Federal Environmental Protection Agency. The impact of this new standard on Bend is unknown at this time.

Figure 10-1

PM-10 Emission Sources in Bend



Source: Oregon Department of Environmental Quality

Although the few occurrences of exceeding these two air quality standards have *not* been of sufficient frequency to have Bend designated as an air quality "non-attainment area," the forecast of significant population and economic growth for Bend and Deschutes County increases concerns about Bend's ability to maintain compliance with the air quality standards.

In 1989, a group of citizens sharing a concern for Bend's air quality started a true "grass-roots" effort to ensure that Bend's air would remain clean and healthy. This group, known as the Bend Clean Air Committee, consists of individuals that represent local, state, and federal government agencies, the scientific community, the medical community, industry, environmental groups, and concerned citizens. Since its beginning, the Bend Clean Air Committee has been very proactive and its efforts have included:

- conducting several surveys to gauge public awareness of air quality issues;
- sponsoring city ordinances restricting open burning and requiring replacement of non-certified wood stoves upon sale of homes;
- conducting educational campaigns;
- maintaining a wood stove burning advisory program during the winter using billboards, banners, public service announcements, and telephone hotlines; and

- giving an annual clean air award recognizing individuals and groups whose actions contribute to preserving and improving air quality.

The existence of the Bend Clean Air Committee was a factor in the federal government's $100,000 grant in 1994 to the Oregon Department of Environmental Quality, the City of Bend, and the Bend Clean Air Committee. The grant paid for monitoring carbon monoxide and particulate pollutant levels in Bend and for developing strategies to maintain compliance with the national air quality standards. Additional information on meteorological conditions in Bend and air quality standards is in two Comprehensive Plan resource documents titled Goal 6: Air, Water, and Land Resources Quality and the Bend Air Quality Project Phase II Work Plan.

Noise Related Issues

Noise emissions come from many different sources. Many noises are inherent within different areas of a community. However, excessive noise can be detrimental to the health, safety and welfare of Bend's citizens. Excessive noise can also cause deterioration of the quality of life within a given area of a community.

The State sets forth rules and policy for regulating noise. These rules quantify acceptable types and thresholds of noise. However, the State no longer enforces these rules and relies on the local governments for enforcement. Section 5.385 of the Bend Code; was adopted by the City of Bend pursuant to the provisions of State statute ORS 467.100. This code specifically identifies and defines different noises that are considered to be loud and raucous. These noises are prohibited within the City. For other noise emissions not identified by the Bend Code, the City coordinates with the local DEQ staff and the ORS as a resource. The City Police Services Department assists in the actual enforcement of noise complaints.

Energy Conservation

The efficient use of energy saves the consumer money, and reduces the need for developing new (and often more expensive) sources of energy. This element addresses energy conservation through a variety of land use planning and construction practices.

While no known sites that have a potential for oil, gas or geothermal resource development exist in the area, there are two hydroelectric sites within Bend. As early as 1910, a small hydroelectric dam was constructed on the Deschutes near downtown to generate power for the growing community. This facility is still in use today. In 1985 the Central Oregon Irrigation District built a hydroelectric facility using water from its irrigation flume along the river to power a small generating plant that is tucked into the hillside opposite Mt. Bachelor Village. In addition, there is still potential for heating and power from locally generated wood wastes, such as slash and mill trimmings. As noted earlier in the Air Quality section, Bend has an active program to upgrade wood stoves for more efficient use of the resource and to maintain air quality in the area.

The large number of sunny days makes this area particularly suitable for solar power, both passive and active systems. During the summer, 300-350 British Thermal Units

(BTUs) of sunlight energy are delivered to each square foot of land in the area, but this level declines to 175-200 BTUs during the winter. Bend was one of the first cities in the state to adopt "solar access" ordinances to provide good solar access during the winter solar heating hours so that homeowners can incorporate passive or active solar systems into their homes.

The Bend area is fortunate to have some potential energy sources. However, the expanding population will continue to test the ability of energy suppliers to meet increasing demand. All available resources will have to be evaluated, used, and made compatible with the economic, social, and environmental goals of the local and regional population. No single answer exists, but a reasonable combination will have to be found. In the meantime, local planning efforts must be aimed at promoting greater efficiency in the use of existing energy resources, and in protecting and developing those resources we will need in the future.

Natural Hazards

Official flood hazard maps for the Bend area and Deschutes County are published by the Federal Emergency Management Agency (FEMA). The flood hazard area within Bend is within or adjacent to the banks of the Deschutes River. During the winter of 1996-97 the high water level in some parts of the urban area exceeded the 100-year flood boundary as mapped by FEMA. The city has requested that FEMA re-evaluate the 100-year flood plain within the urban area and adjust their maps as necessary.

The Oregon Department of Geology and Mineral Industries has mapped some faults within the urban area. More information is needed on the type and extent of these faults.

Steep Slopes

Development on hillsides demands special considerations for site preparation, access, and utility placement. In planning and engineering, slopes are typically described as a percentage figure, which is a measurement of the change in elevation divided by distance. For example, if a lot has a 15 foot change in elevation over a 100-foot distance, the slope would be 15 percent (15/100). As a comparison, the maximum slope or grade on interstate freeways is 6 percent.

Several factors such as rainfall levels, vegetation cover, soil depth and base material affect the stability of slopes. However, it is generally true that as slopes increase in steepness, there is a corresponding increase in the impacts on the natural conditions on the slopes and in the difficulty of construction. A typical or general range describing slopes and the corresponding level of concern are:

Percent Slope	Level of Impact on Environment/Design and Construction Concern
0 - 10%	Slight
11% - 25%	Moderate
26% - 35%	Severe
35% and above	Extreme

Although the Bend urban area is generally on a plateau at the base of the Cascade Mountains, there are a few areas that have moderate to steep slopes. Awbrey Butte, Pilot Butte, Overturf Butte, areas along fault scarps, and some areas along the river canyon in the south and north part of the urban area have slopes of 15 percent and more.

There are several possible impacts associated with construction and road building on slopes:

- **Disruption of natural landform and drainage patterns**. Even when a road follows the contour around a hill there is a need to cut into the hill on the high side and fill on the down slope side to create a level surface. As the slope percent increases, more cutting of the hill on the high side and more filling on the low side is needed to create a level travel way or building site.

  Most high desert soils are loose and powdery, and only a few inches thick. A major side effect of the cut and fill activity needed for road and building construction is the increased possibility of soil erosion. The impacts here are twofold. First, when native grasses, shrubs, trees and other vegetation that hold the soils on steep slopes are removed, there is greater exposure of soil and rock that is subject to wind and water erosion. In addition to erosion, slopes without vegetation are more likely to suffer slumping and sliding. Second, the amount of cut and fill areas, and the modifications to drainage patterns created by streets, driveways, sidewalks, and utility routes, can all create erosion problems and/or the degradation of the exposed rock through winter freeze and thaw cycles.

- **Public safety**. If a road, sidewalk, or other transportation route goes up the hill across the contours, then the steepness of the route can make it difficult for emergency vehicle access any time, and especially hazardous for any type of vehicle or pedestrian movement during winter conditions. Also, the increased impact on drainage and soil movement concerns with steeper slopes can create slumps, breaks or other problems with streets, sidewalks, trails, water and sewer lines, and other utilities.

- **Visual impact**. Because the buttes and other sites with steep slopes can be seen from many parts of the urban area, there is interest in designing developments that minimize the amount disruption to the natural conditions. The Awbrey Butte Master Plan, which covers several hundred acres of steep

slopes on the most prominent butte in town, includes street and site development standards to reduce the visual impact of development. There are several construction and subdivision design measures that can be applied to steep slopes to reduce the potential adverse impacts from development. Such measures include, but are not limited to:

- larger lots to reduce the number of building sites and corresponding disruption of the natural contour and vegetation;
- using narrower right-of-way, pavement widths, and "hammer-head" street ends rather than cul-de-sac bulbs to reduce road cut and fills;
- taking access off alleys on the uphill side of a street to reduce driveway cuts into the hillside;
- placing sidewalks at the curb, or having only one sidewalk along the street to reduce the cross-slope cut and fills;
- adjusting the building setback from property lines to minimize building site cuts and fills;
- regulating the amount of vegetation cleared off a hillside lot;
- requiring temporary use of hay bales, diversion dams, or other physical changes to control storm runoff during road and site construction; and
- setting maximum grade or slopes on public streets and pedestrian corridors.

Additional information, measures, and policies on street construction on steep slopes are included in Chapter 7, *Transportation Systems*.

Wildfire

Wildfire *risk* (the likelihood of a fire occurring based on historical fire occurrence and ignition sources) is identified by the Greater Bend Community Wildfire Protection Plan (2012), as high to extreme in the Bend area. Vegetation management, such as thinning and brush removal, may reduce the *hazard* (resistance to control, once a fire starts, based on weather, topography, and vegetation type) in some areas, but further mitigation measures are needed to protect new and existing development in the Wildland Urban Interface (WUI). Additional mitigation measures fall into two categories: development patterns and construction techniques.

Construction techniques are typically enforced through the use of building codes. For example, the building codes found in the 2012 International Wildland-Urban Interface Code (IWUIC) would provide a logical extension of the International Fire Code presently used by the City of Bend to protect commercial buildings. The IWUIC is directed toward the protection of residential development in the wildland-urban interface. The City will involve key stakeholders to determine the appropriate building code language necessary to reduce wildfire hazard to residential structures located in the WUI.

The IWUIC may require some modification to meet Bend's development pattern needs in the UGB expansion areas. The IWUIC depends on widely spaced buildings to provide defensible space against wildfire; however, this may not be an appropriate land use pattern in areas that are expected to expand in the future. Therefore, in expansion areas where greater land use efficiency (i.e., smaller lots and more closely spaced buildings) is appropriate, the City may consider allowing buffers of aggregated

defensible space commensurate with wildfire hazard instead of widely spaced individual buildings.

Policies

Air Quality

10-1 The city will continue to work towards improving circulation and traffic flow through the city in order to reduce carbon monoxide levels.

10-2 The city will regulate open burning, wood stove installations, and consider other measures to improve air quality within the urban area.

10-3 The city will cooperate with DEQ in continuing to monitor industrial emissions.

10-4 The city shall review land-use development in the Bend Urban Area as to its potential air quality impact on Class I areas within a 20-mile radius.

10-5 The city shall develop a plan and program to mitigate any air quality problems, before the city gets out of compliance with air quality standards.

10-6 The city shall support local citizen organizations in their efforts to improve the air quality in Bend.

10-7 The city and county shall develop a plan to mitigate the adverse air impacts of sanding roadways during winter weather.

10-8 The City, in cooperation with State and local agencies and volunteer special interest groups, shall consider a long range strategy for improving air quality to address issues such as the reduction of air toxins, haze, and air particulate. At a minimum, the strategy shall include:

- Provide prior notice to DEQ of pending land use development that might be a new source of air pollution.
- Require that all new development comply with any applicable state or federal air quality standards as part of the land use application process.

Noise Control

10-9 The city shall coordinate with the DEQ as a resource regarding noise related issues and will require any applicable state or federal noise standards to be met as part of individual land use applications

Energy Conservation

10-10 The use of alternative energy sources should be encouraged.

10-11 Any energy producing projects shall be consistent with the community's wildlife, recreation, open space, and scenic resource values.

Natural Hazards

10-12 The city shall continue to apply their Flood Plain zoning regulations along the Deschutes River and Tumalo Creek based on the best available data.

10-13 The city shall encourage the Oregon Department of Geology and Mineral Industries to complete an assessment of faults in the Bend area.

10-14 The city shall review the construction plans for buildings that are proposed to be built across or along identified fault lines.

Steep Slopes

10-15 The city shall require development on slopes in excess of 10 percent to employ measures to minimize the hillside cuts and fills for streets and driveways.

10-16 The location and design of streets, structures and other development features on slopes in excess of 10 percent shall give full consideration to the natural contours, drainage patterns, and vegetative features of the site to protect against temporary and long-term erosion.

10-17 In areas where the natural slope exceeds 20 percent, the city may reduce the minimum residential density (allow larger lots) or alternatively, may require cluster development through the PUD process to preserve the natural topography and vegetation, and improve fire protection.

Wildfire

10-18 The City will adopt strategies to reduce wildfire hazard to lands inside the City and included in the Urban Growth Boundary. These strategies may, among others, include the application of the International Wildland-Urban Interface Code with modifications to allow buffers of aggregated defensible space or similar tools, as appropriate, to the land included in the UGB and annexed to the City of Bend.