

DOCUMENTS

LOCAL

Klamath Falls  
(1979)

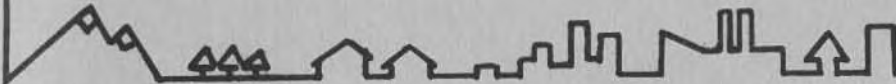
**Final Draft**

**City of Klamath Falls**  
**COMPREHENSIVE PLAN**

**Orig. 6-28-78**

**Rev. 1-16-79**

**Subject to further revision**



Department of Planning  
City of Klamath Falls

RECITALS AND COOPERATING AGENCIES

Produced by the  
City of Klamath Falls  
Citizen Involvement Program  
and  
Department of Planning

with the assistance of the  
Departments of Public Works, Finance, Parks & Recreation, & Legal Services

\* \* \*

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COOPERATING AGENCIES

- Klamath Falls Public School Districts
- Klamath County Departments of Planning and Public Works and County Museum
- Klamath County Economic Development Association

COOPERATING AGENCIES (continued)

Klamath County Special Service Districts

- Schools
- Enterprise Irrigation
- Klamath Irrigation
- Soil and Water Conservation

Klamath Housing Authority

State of Oregon

- Housing Division
- Department of Economic Development
- Emergency Services Division
- Department of Fish & Wildlife
- Department of Geology & Mineral Industries
- Employment Division
- Health Division
- Department of Land Conservation & Development
- Public Utilities Commissioner
- Department of Transportation
- Water Resources Department
- Oregon Institute of Technology

United States Government

- Soil Conservation Service
- Forest Service
- Extension Service
- Bonneville Power Administration
- Corps of Engineers
- Bureau of Reclamation
- Postal Service
- Department of Defense (Air Force)

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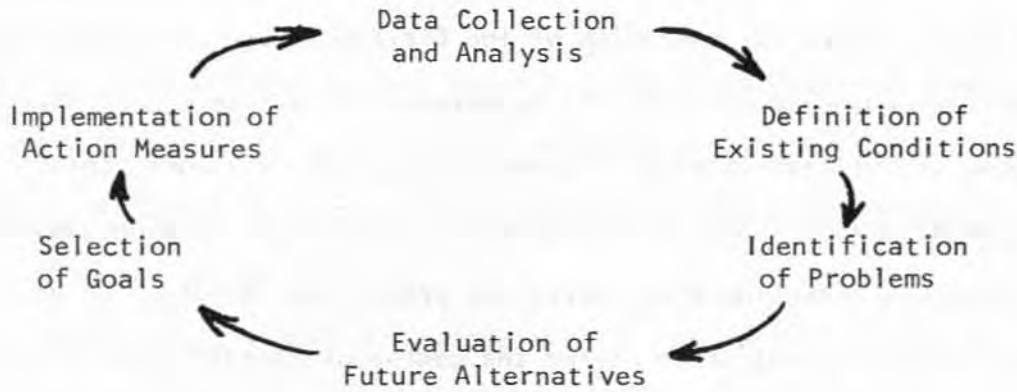


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### THE PLANNING PROCESS

Planning in the City of Klamath Falls is a continuous, on-going process composed of the following:



This continuous planning process is centered around the Comprehensive Plan, which is the City's overall policy guide for future growth and development. The Plan is designed as a framework for all decisions and actions relating to the community, and is intended to provide an adequate, factual base for such decisions and actions. The Plan includes: historical background and current factual information for each facet of the community; identification of current problems and issues; evaluation of probable future conditions; ultimate policy choices; and specific implementation measures.

Just as the planning process is dynamic and changing, so too is the Plan. Amendments will occur annually for minor revisions and every three years for major revisions. Minor changes are those which do not have significant effects beyond the immediate area of the change, and major changes are those that have widespread significant impact beyond an immediate area.

The preparation and revision of the Plan is dependent largely upon citizen involvement and agency coordination. Through its official Citizen

Involvement and Agency Coordination Programs the City will provide opportunities for citizens and affected government agencies to be involved in all phases of the planning process. Citizens are and will be assured of: effective two-way communication with decision-makers; access to understandable technical information; appropriate feedback from decision-makers; and adequate financial support for operation of the Citizen Involvement Program. Affected government agencies are and will be assured of: access to all City plans, programs, and ordinances affecting their work; all City work schedules on projects affecting their work; preliminary drafts of all plans, programs, and ordinances affecting their work; and prompt consideration of any suggestions or conflicts that arise during the course of coordination.

The Comprehensive Plan, all referenced appendices, and all implementation measures will be given the widest possible dissemination in the community in order to reinforce a planning process designed to serve all citizens and agencies as expediently and fairly as possible.

## DEFINITIONS

The definition of words and terms below is intended to explain the meaning of the words and terms in the context of the Plan. The definitions are not intended to have applicability outside of the Klamath Falls Comprehensive Plan context.

Accretion. The buildup of land along a beach or shore by the deposition of waterborne or airborne sand, sediment, or other material.

Adversely affect. Something that is unfavorable in its impact on another individual or on the land.

Agricultural lands. Land of predominantly Class I, II, III, IV, V, and VI soils as identified in the Soil Capability Classification System of the United States Soil Conservation Service, and other lands which are suitable for farm use taking into consideration soil fertility, suitability for grazing, climatic conditions, existing and future availability of water for farm irrigation purposes, existing land use patterns, technological and energy inputs required, or accepted farming practices. Lands in other classes which are necessary to permit farm practices to be undertaken on adjacent or nearby lands, shall be included as agricultural land in any event.

Agriculture. The use of land for natural resource purposes including timber production. On the Plan, it includes those areas outside the Urban Growth Boundary not anticipated to be needed for other than natural resource purposes.

Archaeological resources. Those districts, sites, buildings, structures, and artifacts which possess material evidence of human life and culture of the prehistoric and historic past. See Historical resources.

Auto-oriented commercial. Those areas containing a broad range of commercial activity, which has developed in a haphazard fashion along major street rights-of-way, often referred to as "strip" commercial.

Avulsion. A tearing away or separation by the force of water. Land which is separated from uplands or adjacent properties by the action of a stream or river cutting through the land to form a new stream bed.

Buffer area. An area which provides a separation between potentially conflicting land uses, particularly urban and rural uses. Such a buffer may be used for low density or public open space purposes.

Buildable lands. Lands in urban and urbanizable areas that are suitable, available, and necessary for residential use.

Carrying capacity. Level of use which can be accommodated and continued without irreversible impairment of natural resources productivity, the ecosystem and the quality of air, land and water resources.

Citizen. Any individual within the planning area; any public or private entity or association within the planning area, including corporations, governmental, and private agencies, associations, firms, partnerships, joint stock companies and any group of citizens.

Cluster. A grouping of development. Specifically, the locations of structures on a given site in one area leaving the remainder of the land in open space.

Comprehensive Plan. The Klamath Falls Comprehensive Plan, which interrelates all functional and natural systems and activities relating to the use of lands, including but not limited to sewer and water systems, transportation systems, educational systems, recreational facilities, and natural resources and air and water quality management programs. "Comprehensive"

means all-inclusive, both in terms of the geographic area covered and functional and natural activities and systems occurring in the area covered by the Plan. "General nature" means a summary of policies and proposals in broad categories and does not necessarily indicate specific locations of any area, activity or use. A plan is "coordinated" when the needs of all levels of government, semi-public and private agencies, and the citizens have been considered and accommodated as much as possible. "Land" includes water, both surface and subsurface, and the air.

Conserve. To manage in a manner which avoids wasteful or destructive uses and provides for future availability.

Density of use. The average number of a given thing per unit of area. Generally applied to a residential development in terms of dwelling units per acre. The density is measured on the gross land area. Within that ownership varying densities may be used.

Develop. To bring about growth or availability; to construct or alter a structure, to conduct a mining, dredging, filling, or similar operation, to make a material or physical change in the use or appearance of land or water, to divide land into parcels, or to create or terminate rights of access.

Diversity or difference. Diversity implies the mixture of land uses within a given area to encourage the development of heterogeneous residential areas.

Downtown. An area of the City of Klamath Falls that includes the commercial core area, central business district, and the downtown residential area. The downtown area includes commercial, industrial, residential and open space and recreation uses.

Drainage way. The bed and banks of a waterway used to discharge surface waters from a given area. It also includes adjacent areas necessary to preserve and maintain the drainage channel.

Ecosystem. The living and nonliving components of the environment which interact or function together, including plant and animal organisms, the physical environment, and the energy systems in which they exist. All the components of an ecosystem are interrelated.

Fill. The placement by man of sand, sediment, or other material, usually in submerged lands or wetlands, to create new uplands or raise the elevation of land.

Floodplain. The area adjoining a stream, tidal estuary or coast that is subject to regional flooding. A regional flood is a standard statistical calculation used by engineers to determine the probability of severe flooding. It represents the largest flood which has a one percent chance of occurring in any one year in an area as a result of periods of higher than normal rainfall or stream flows, extremely high tides, high winds, rapid snowmelt, natural stream blockages, or combinations thereof.

Forest lands. They are the (1) lands composed of existing and potential forest lands which are suitable for commercial forest uses; (2) other forested lands needed for watershed protection, wildlife and fisheries habitat and recreation; (3) lands where extreme conditions of climate, soil and topography require the maintenance of vegetation cover irrespective of use; (4) other forested lands in urban and agricultural areas which provide urban buffers, windbreaks, wildlife and fisheries habitat, livestock habitat, scenic corridors and recreational use.

Goal. A statement of intention expressing community values and attitudes intended to provide a guide for action by the community.

Historical resources. Those districts, sites, buildings, structures, and artifacts which have a relationship to events or conditions of the human past. See Archaeological resources.

Innovation. The introduction of something new. Generally, the use of a new design concept such as clustering to promote better land utilization and to establish a more diverse community. Also, it is a revision of the land development regulations of the City to encourage better land utilization.

Key facilities. Basic facilities that are primarily planned for by local government but which also may be provided by private enterprise and are essential to the support of more intensive development, including public schools, transportation, water supply, sewage and solid waste disposal.

LCDC. Land Conservation and Development Commission of the State of Oregon.

Livability. Those aspects of the community perceived by residents which make Klamath Falls a "nice place to live". A precise definition of these factors differs with the purpose of the definition.

Maintain. Support, keep and continue in an existing state or condition without decline.

Natural areas. Includes land and water that has substantially retained its natural character, which is an important habitat for plant, animal, or marine life. Such areas are not necessarily completely natural or undisturbed, but can be significant for the study of natural, historical, scientific, or paleontological features, or for the appreciation of natural features.



Natural hazard. A natural characteristic or combination of characteristics which are known to endanger the public health, safety or general welfare.

Natural resources. Air, land and water and the elements thereof which are valued for their existing and potential usefulness to man.

Open space. Consists of lands used for agricultural or forest uses, and any area that would, if preserved and continued in its present use:

- a. Conserve and enhance natural or scenic resources;
- b. Protect air or streams or water supply;
- c. Promote conservation of soils, wetlands, beaches, or tidal marshes;
- d. Conserve landscaped areas, such as public or private golf courses, that reduce air pollution and enhance the value of abutting or neighboring property;
- e. Enhance the value to the public of abutting or neighboring parks, forests, wildlife preserves, nature reservations or sanctuaries or other open space;
- f. Promote orderly urban development.

Planning area. The air, land and water resources within the jurisdiction of a governmental agency.

Policy. A decision-making guideline for actions to be taken in achieving goals. The policy is the official position of the City of Klamath Falls related to a given land use issue. Policies guide actions in recurring situations.

Pollution. The violation or threatened violation of applicable State or Federal environmental quality statutes, rules and standards.

Professional office. Facilities within which members of various professions may practice their vocation in a manner compatible with abutting properties.

Public. Lands owned by local, State or Federal government used for purposes which benefit the public health, safety or general welfare or otherwise service the needs of society.

Public facilities and services. Projects, activities and facilities which the planning agency determines to be necessary for the public health, safety, and welfare.

Recreation. Any experience voluntarily engaged in largely during leisure (discretionary time) from which the individual derives satisfaction.

- a. Low intensity recreation. Does not require developed facilities and can be accommodated without change to the area or resource, e.g., boating, hunting, hiking, wildlife photography, and beach and shoreline activities can be low intensity recreation.
- b. High intensity recreation. Uses specially built facilities, or occurs in such density or form that it requires or results in a modification of the area or resource. Campgrounds, golf courses, public beaches, and marinas are examples of high intensity recreation.

Residential area. A given area of the community in which the vastly predominate character is residential. Uses which support residential activity such as parks, churches, schools, fire stations, utility substations may be permitted as conditional uses in all residential areas. These areas have not yet been identified as neighborhoods, although it is presumed that some of them will be designated as such during the planning process.

Rural land. Rural lands are those which are outside the Urban Growth Boundary and are: (1) non-urban agricultural, forest or open space lands or, (2)

other lands suitable for sparse settlement, small farms or acreage home-sites with no or hardly any public services, and which are not suitable, necessary or intended for urban use.

Schools. A place of instruction operated by the planning area's official school district. It includes buildings and adjacent open spaces which form the school grounds.

Services. Those public facilities and utilities which are necessary for urbanization.

Severe limitations. The degree of limitation of the land caused by one or more natural characteristics. Those limitations considered severe include, but are not limited to:

- a. Floodplain. The area adjoining a stream, tidal estuary or coast that is subject to regional flooding. A regional flood is a standard statistical calculation used by engineers to determine the probability of severe flooding. It represents the largest flood which has a one percent chance of occurring in any one year in an area as a result of periods of higher than normal rainfall or stream flows, extremely high tides, high winds, rapid snowmelt, natural stream blockages, or combinations thereof.
- b. Slopes. All lands having a slope greater than 20 percent.
- c. Bedrock. Lands where the bedrock is within 20 inches of the surface.
- d. Shrink-swell potential. Those lands where the Soil Conservation Service defines the potential as severe or very severe.
- e. Watertable. Land where the seasonal high watertable is within ten inches of the surface.

- f. Permeability. Land where the ability of the soil to absorb water is less than 0.2 inches per hour as defined by the Soil Conservation Service.
- g. Drainage. Land where the drainage is classified as being poor and very poor by the Soil Conservation Service.
- h. Weak foundation soil areas. Land where the potential for foundation problems is "high" anywhere in the soil profile (0 to 60 inches).

Sidewalk. A pedestrian walkway.

Significant habitat areas. A land or water area where sustaining the natural resource characteristics is important or essential to the production and maintenance of aquatic life or wildlife populations.

Social consequences. The tangible and intangible effects upon people and their relationships with the community in which they live resulting from a particular action or decision.

Urban. Those places which are developed to such a degree that urban services are needed. Generally this includes all lands within the corporate boundaries of a city and land adjacent to that boundary where significant development has taken place.

Urban fringe. That portion of the planning area outside of the existing city limits.

Urban Growth Boundary. A line that circumscribes the urban growth area.

Urban land. Urban areas are those places which must have an incorporated city. Such areas may include lands adjacent to and outside the incorporated city and may also: (1) have concentrations of persons who generally reside and work in the area; (2) have supporting public facilities and services.

Urbanizable land. Urbanizable lands are those lands within the Urban Growth Boundary and which are identified and (1) determined to be necessary and suitable for future urban areas; (2) can be served by urban services and facilities; (3) are needed for the expansion of an urban area.

Unbuildable. Land which because of its natural character or location is unsuitable for urban development.

Underdeveloped. Land which is not developed to its highest economic potential. Included are lands zoned for apartments although used for single-family homes, or land zoned for commercial use used for residential purposes.

Wetlands. Land areas where excess water is the dominant factor determining the nature of soil development and the types of plant and animal communities living at the soil surface. Wetland soils retain sufficient moisture to support aquatic or semi-aquatic life. In marine and estuarine areas, wetlands are bounded at the lower extreme by extreme low water; in freshwater areas, by a depth of six feet. The area below wetlands is submerged lands.

M A P N O T E

SUB-ELEMENT:           DEFINITIONS

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP  
DEPICTING THE FOLLOWING ITEMS:

PLANNING AREA  
AFFECTED GOVERNMENTAL JURISDICTIONS

THIS MAP CURRENTLY EXISTS IN ROUGH DRAFT ONLY, AND IS NOT  
AVAILABLE FOR REPRODUCTION. HOWEVER, DRAFT COPIES ARE  
AVAILABLE FOR INSPECTION AT THE CITY PLANNING DEPARTMENT  
OFFICE.



N A T U R A L   R E S O U R C E S  
E L E M E N T

---

INCLUDING THE FOLLOWING SUB-ELEMENTS:

LAND

AIR

WATER

CLIMATE

WILDLIFE

OPEN SPACES & SCENIC AREAS

HISTORY





## LAND SUB-ELEMENT

## Land - History (1)

Geologists have had difficulty in determining the exact age of the formations of the Basin -- there are limited fossils to use for dating, and repeated volcanic activities until recent time, geologically speaking, have completely covered earlier formations. Mount Mazama, which eventually became Crater Lake, erupted as recently as 7,000 years ago.

Ocean waters covered the area millions of years past. To the south and west, about 100,000,000 years ago, islands appeared -- the forerunners of the Klamath Mountains. Eventually the ocean receded and much of Oregon was level, subtropical land. Animal life roamed freely and some ancient fossil bones have been found in the lower sections of the Basin. Trees such as cinnamon, avocado and fig, as well as sycamore and redwood, flourished in the warm climate.

During the ensuing millennia, many changes occurred. Dacitic lava flowed during the Eocene and Oligocene times (60-30 million years ago). The oldest of rocks exposed in the area, evidence of the Dacitic flow, are found east of the Basin. Erosion and the subsequent volcanic activity of late Oligocene and early Miocene times (30-20 million years ago) covered the earlier formations with new debris. (Oil drilling in Lake County suggests that these deposits could be 13,000 feet thick.) Much of the older part of the Cascades was formed, then eroded. The Columbia River Basalt flows occurred during this period, covering much of the Pacific Northwest, including parts of the old Cascades, with layers of basaltic lava.

In the late Miocene and early Pliocene period (15-2 million years ago), the uplifting of the deeply covered lava surface formed the present Cascades. A string of volcanoes emerged on the eastern slopes; along them were the mountains McLoughlin, Mazama, Theilson and Diamond Peak. Volcanic eruptions again inundated the Basin with fresh sediment, found, now, buried beneath hundreds of feet of basic lava. (These rocks form the most permeable aquifer, or groundwater storage area, and vary in thickness from 20 to 600 feet.) The pumice and cinders from these volcanic eruptions are some of the natural resources of the Basin. The Cascade Range became a wall between the Basin and the sea, shutting off much of the moisture from the ocean, and causing the aridity of the eastern region.

## Land - History (2)

About this same time, fault blocks, not volcanic action, formed the hills and valleys to the east of Klamath Falls. The faulting began with stresses giving rise to a fracture in the earth's crust; slippage occurred, and the land on one side of the fracture rose, while that on the other fell. In Klamath County, numerous adjacent parallel blocks are faulted, this action forming hills and valleys. Some of the vertical movements have been estimated to be as much as 1,600 feet. Several fault scarps are exposed, as at Stukel Mountain and Rattlesnake Point. The scarp north of town near Algoma is reported to be Oregon's longest exposed, striated fault surface. The fault blocks run north and south, some 50 to 75 miles in length. Faults on the east side of the Basin have an abrupt declivity on the west (the fault scarps) but gentler slopes on the east. Those to the west have an opposite pattern. The lower block in a fault is called a graben, and it is in such a graben that the city of Klamath Falls lies.

During the Pleistocene age, about two million years ago, much of the North American continent was sheated in ice. Although no continental ice caps reached the Basin proper, alpine glaciers formed on the mountains and their meltings produced the waters which inundated much of the Basin. Natural dams eroded and the lakes drained, then new dams would form, again trapping the waters. It is believed that at one time the waters from the Basin drained into the Pit River until erosion and/or earth movement formed the Klamath River Canyon.

Evidence of the flooding can be found in the small microscopic organisms called diatoms which flourished in the covering waters. Their remains, composed of silicon, were deposited and compacted, forming the diatomaceous or "chalk" beds that have become one of the Basin's natural resources. Other freshwater fossils are found both north and south of the city. Embedded in hard rock at Rabbit Flat (now Wocus) are impressions of freshwater shells: carinifex, snail, lanx and limpit. These are believed to be from the Pliocene age (15-2 million years ago), but carinifex and lanx are found living in Upper Klamath Lake.

The soils of the Basin have been developing for 25,000 years. Silt, sand, clay, gravel, diatomite and ash material are being deposited by the lake and stream action as they were in the past. The waters patterned much

### Land - History (3)

of the area by eroding fine materials and transporting them to other areas. Where water once deposited its load of fine particles of clay, chalk, and sand, little water is now available. Pumice and other airborne volcanic materials have been blown into the Basin, the eruption of Mount Mazama contributing a large amount. The weathering of these deposits and of the lava flows created the fertile soils currently found in the Basin. Those soils frequently under water have become somewhat alkaline in nature due to the salts left when the mineralized waters evaporated.

Numerous earthquakes have been reported for the Basin and data from several sources show earthquakes of varying intensities occurring on the following dates: November 1873, April 1906, April 1920, January 1922, January 1923, October and December 1947, March 1948, April and December 1949, and April 1951. For several years, Oregon State University had a seismograph on the OIT campus, but it is no longer in use. Apparently, none of the quakes caused any serious damage.

### Vegetation

The earliest surveys of the Klamath Basin show vegetation patterns similar to those today. The flora can be separated into two distinct groups, distributed chiefly according to the alkalinity of the soil. Plants that grow in salty soil (halophytic flora) were found in the alkaline meadows and marshy areas, and included salt grass, tansey, grease wood, green molly, silver salt bush, sagebrush and bullrush. The higher levels with more neutral soils supported juniper and some mountain mahogany, sage-, horse-, antelope- and rabbitbrush, service berry, balsam root, sunflowers, mustards, wintercress, prarie clover and assorted lupins. Several of the plants of the Basin (and also some insects) carry klamathensis as their taxonomical name, indicating that this particular species was first discovered in the Klamath area.

Of the heavier forested lands, 88 percent consisted of the conifer, yellow pine or lodgepole pine. Less than one percent of the trees were deciduous. Around the waterways were cottonwoods and several species of willows.

The Indians used the trees and plants for food. One small species of pine formed dense thickets near the water. In the spring when the sap was

## Land - History (4)

running, the Indians peeled its bark to a height of 20 feet and ate it. Along the shores of the lake grew tule weed and scirpus which the Indians used to make baskets, mats and lodge roofs. The largest tule species grew to over 10 feet. The lower end of its cane furnished a juicy delicacy. The basic staple of the Indians was the wocus, which grew in profusion around the lake. Another major foodstuff -- Ipo (pronounced A'PĀ) -- was gathered in large quantities; this plant resembles a mustard plant or common weed at best. The root, the food portion, was eaten raw, dried, ground, roasted or cooked into cakes or meal. Ipo tastes much like coconut and served as the potato of that society. An additional food product was camas, including the poisonous white camas; the Indians used a wash process which eliminated the poison, making the plant edible. The exact process is no longer known.

In addition, the plant 'sheldsh' was brewed to make tea, and coyote grass was dried and smoked.

## Land - Current Conditions (1)

Klamath Falls is located at 42°14' North Latitude, 121°47' West Longitude and lies directly east of the Cascade Mountain range.

Two major land forms (physiographic provinces) meet in the Klamath Basin and are differentiated by land profile and climate:

- (1) The Basin and Range Province extends from Southern Oregon into Mexico and is characterized by parallel down-faulted valleys separated by fault block mountains;
- (2) the Sierra-Cascade Province, formed of the Sierra-Cascade Mountain chain, extends from Southern Canada to the Mojave Desert in California.

The entire Klamath Basin is a land of contrast between high mountains and flat valley floors. Mount McLoughlin at 9,495 feet is the highest peak of the western border formed by the Cascades; about 50 miles to the north-east is 8,364-foot Gearhart Mountain. The level of the valley floor ranges from 5,000 feet in elevation in the Sycan Marsh area to the 4,030-foot Tule Lake Sump in California. The lowest point in the Basin is the 2,750-foot elevation of the Klamath River Canyon, 25 miles southwest of Klamath Falls. The city proper lies between 4,100 and 4,200 feet above mean sea level.

Geologic fault lines through the urban area have been mapped and run generally northwest-southeast. The seismic risk is listed as moderate, having a Modified Mercalli Intensity Potential of VII and several quakes have occurred in the area (see Land - History). Although the faults are susceptible to tremors and minor movement is frequent, quakes are not considered a threat to human activity in the area.

Two distinct types of soil formations are found in the urban area, sediments and volcanic. Throughout the flat, low-level land are the deposited aluvial materials -- silt, sand, gravel, diatomite -- and airborne materials from the local volcanic activity -- ash and pumice. These fertile materials are valuable as farm lands. At higher elevations, thin, rocky soil has developed on Pliocene Volcanics; rocks are difficult to excavate and cause major problems for construction.

There are about two dozen different soil series types within the urban area. (See the soils map.) The major portion of the city falls within the following series: Forney, Lorella, Dodes, Harriman-Lorella, and Henley-Laki. The Soils Inventory of Klamath County, provided by the U. S. Department of

## Land - Current Conditions (2)

Agriculture Soil Conservation Service, describes these types specifically. A capability classification shows, generally, the suitability of soils for most field crops. The Klamath Falls area primarily falls within the VII class (soils having very severe limitations that make them unsuited to cultivation and restrict their use largely to pasture or range, woodland, or wildlife), with a fair amount of III (soils having severe limitations that reduce the choice of plants, require special conservation practices, or both), and IV (soils having very severe limitations that reduce the choice of plants, require very careful management, or both). There are also some class VI and a small amount of II soils (soils having severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife; and soils having moderate limitations that reduce the choice of plants or that require moderate conservation practices, respectively).

Portions of the flat lowlands of the Basin, lying close to extensive surface waters are considered as floodplains (see map). These flood prone areas are dry in some seasons of the year but are inundated when heavy rain and melting snow cause the adjacent waterways to overflow. Flooding within the Klamath Basin occurs periodically -- the major flood in the winter of 1964-65 inundated some 67,600 acres. Since then, the dam at Keno has been replaced and the new dam is designed to control the large flood flows.

The wide diversity of land formation, soil type and geographic hazard in the urban area result in the majority of land having at least one characteristic definable as a severe limitation for development. These limitations include slopes, floodplains, and soil characteristics which create such hazards as weak foundations, soils, land slumping, etc.

Aggregate and mineral resources produced in the Klamath Basin include, in descending order of value, stone, sand and gravel, pumice and volcanic cinders, and clay. Their industrial production amounts to several million dollars each year.

Sand and gravel are vital raw materials for the construction industry, the main market for its consumption. Deposits of quality sand and gravel are scarce near Klamath Falls, and the current source of sand and gravel is two deposits formed as alluvial fans where streams entered an ancient lake.

## Land - Current Conditions (3)

However, these deposits have impurities -- volcanic rocks, clay and ash -- and these impurities limit their use. When sufficient quantities of satisfactory gravel aggregate are not available, the residual gravel and boulders are crushed, or massive rock deposits are quarried and crushed. One quarry about six miles from the city crushes and screens a jointed black glassy basalt to furnish large quantities of concrete and asphalt aggregate.

Many of the volcanic rocks have suitable physical properties for use as building stone. However, these generally lie in the eastern portion of the county and are difficult to transport. Clay suitable for bricks has been quarried in Klamath Falls; but it is generally mixed with imported clays to give a better product. Several types are usually combined; the sandy, non-plastic clay and the granular hardpan are produced locally but the binding, plastic clays are imported.

Current sites of mineral resources found within the Klamath Falls area are shown below:

Type of Mineral	Location	Life Expectancy of Site
Round river rock	Stukel Mountain Old Fort Road	Extended App. 5 years
Quarry gravel	Shady Pine N. 97 Stewart Lennox (Stiles) Stewart Lennox (Holiday) Merrill area (O'Connors) Stukel Mountain (County)	Extended App. 3-5 years App. 5 years Extended Extended
Black cinders	Cinder Dome near Keno (Kerns)	App. 20 years
Sand (acceptable for concrete)	Old Fort Road	Undetermined
Clay	Town Quarry (40 acres) Wocus Quarry (70 acres) KAGO Hill (400 acres)	App. 20 years App. 30 years Undeveloped

Other nonmetallic mineral resources found around Klamath Falls are diatomite and peat. Diatomite underlies much of the southern portion of the Basin and is presently being deposited in Klamath Lake, Agency Lake and the Klamath Marsh. Although some deposits contain filter-grade material, their



#### Land - Current Conditions (4)

high volcanic ash content and other impurities preclude a commercial use. Peat is the partial decomposition of plant material under or in a water-saturated environment, and occurs in areas that are, or have been, covered by shallow lakes and swamps. This material is mainly used as a soil conditioner, but it can be used as fuel.

Fossil wood and agates, a resource which interests "rockhounds", are found in parts of Klamath County, mainly the eastern area.

#### Vegetation

The current vegetation in the area of the city remains much the same as it was before the first buildings were erected in Linkville, although some of the common names have changed over the past century. Land undisturbed by man's works has plants such as spring-golds (biscuit root), sunflowers, filaree, sagebrushes, lupines, rabbitbrushes, tansey, grasses and other ephemeral and perennial species. Junipers, lodgepole pines, buckbrush, grease wood, mountain mahogany, service berry, bitter brush, Klamath plum, bitter and choke cherries grow on the hills and in the draws of the Klamath Falls area. The lakeshores and river banks and marshes support bullrush, cattails, water hemlock, willows, sedges and grasses.

On land where man has settled and then abandoned, many of the native shrubs and annual plants (weeds) are again appearing. In April and May, those who look are rewarded with a wide variety of colorful wildflowers, even in the craggy arid areas. Often these tiny blooms measure less than one quarter inch across and are hard to find, but even the pesky button weed, the bane of all gardeners, presents a pinkish-lavendar blossom to color the landscape.

Within the city limits lies a 1,600-acre tract of forest lands, annexed in the early 1970's. A recent inventory of the area by the Forest Service resulted in the following breakdown of timber species:

## Land - Current Conditions (5)

Eco/Soil Type	Acres	Volume MMBF
Mixed conifer -- Douglas fir, Ponderosa pine, White fir/Woodcock #840	101	1,099
Ponderosa pine -- Juniper/Lorella #820, Royst #850, Lobert #460	294	2,052
Ponderosa pine -- Juniper/Royst #850, (burn) Lorella #820, Woodcock #840	260	0
Unproductive forest -- Juniper, mahogany, Ponderosa pine, sagebrush, rabbitbrush, cheatgrass, bunchgrass and grassland	945	0
Total	1,600	3.151

Vegetation as a land feature is important because of its contributions to the quality of the community through control of erosion, sound absorption, reduction of air pollutants, modifications of temperature, humidity, evapotranspiration, and air flow. Its aesthetic qualities help to soften the impact of the urban environment on people.

## Land - Problems (1)

- Earthquake hazards of relatively unknown potential may exist along identified fault lines, and may be amplified in adjacent alluvial soils.
- Excessive (20%+) slopes limit development.
- High water tables (0-24 inches) limit development.
- Soils classed as poor agricultural also present severe engineering problems for urban use.
- The excessive use of 4-wheel vehicle off-road activities creates erosion problems.
- Areas located along Upper Klamath Lake, Link River, Lake Ewauna, and Klamath River represent floodplain hazards.
- There exists a lack of proper sands for use in concrete construction.
- Only two sources of round river rock are currently available.

D E T A I L E D   A S S E S S M E N T   N O T E

SUB-ELEMENT:            **LAND**

THE CONTENT OF THIS SUB-ELEMENT IS SUPPLEMENTED BY THE FOLLOWING DETAILED ASSESSMENTS WHICH WILL BE ADOPTED BY REFERENCE WITH THE COMPREHENSIVE PLAN:

U. S. SOIL CONSERVATION SERVICE  
SOIL INVENTORY

OREGON DEPARTMENT OF GEOLOGY  
RECONNAISSANCE OF KLAMATH COUNTY  
MINERAL RESOURCES

COPIES OF THESE ASSESSMENTS MAY BE AVAILABLE FROM THE ORIGINATING AGENCY OR CAN BE INSPECTED AT THE CITY PLANNING DEPARTMENT OFFICES.

Land - Future Alternatives (1)

- The supply of land remains static while the need for more buildable lands will increase with increasing population.
- Natural limitations, such as topography, soil character, etc., will increasingly conflict with market demands.
- Agricultural acreage is decreasing and will be strongly protected.
- A shift in public demand to higher urban densities, coupled with improved mass transit systems, reduces land areas needed in urban areas.
- The cost of land may drop, thereby increasing land consumption through larger single family units.
- Many undeveloped quarrying sites may be put into use as the need occurs.

## Land - Goals (1)

- To preserve and maintain agricultural lands.
- To conserve forest lands for forest uses.
- To maintain the quality of the air, water and land resources of the state.
- To protect life and property from natural disasters and hazards.

## Land - Policies (1)

- The extraction of mineral or aggregate materials should be in a manner protective of surrounding property and should include screening, dust control, daylight operation, nonresidential truck access.
  - All extraction sites should be planned for reuse upon depletion of the resource and such reuse should be consistent with the Comprehensive Plan.
  - Natural vegetation along streams, drainage ways, and other shorelines should be maintained, and preserved.
  - No development should be allowed to block streams and drainage ways in any area, or to increase the water level on adjacent property.
  - Areas of dense standing trees and shrubbery should not be considered for extensive development; tree cutting should be minimized.
  - Development practices should avoid grading plans that expose unprotected surfaces from water flows and possible erosion.
  - Extensive watering of landscape and use of subsurface drains should be avoided.
  - Land form alterations proposed in areas with the following conditions should show that design and construction techniques eliminate public harm, public costs, and adverse effects to surrounding properties:
    - Slopes exceeding 30 percent should be left in natural state;
    - Severe soil erosion potential;
    - Land subject to slumping or sliding.
  - Land-related hazards such as erosion or soil exhibiting poor foundation potential should not necessitate disapproval of development, but higher development costs can be expected in order to minimize hazards.
- Guidelines for site investigations and the qualifications of experts should be provided by the City. Construction should take place in only

## Land - Policies (2)

those areas where site investigations indicate that construction is feasible; construction should be in conformance with applicable site reports. Where necessary, the building officials may require an architect's or an engineer's approval on the building plans in addition to that of a geotechnical expert.

- The Federal Flood Insurance and/or applicable ordinances will be maintained and enforced.



## Land - Implementation Measures (1)

- The City will provide for public education and involvement in understanding the limitations of the area.
- Floodplain and wetlands regulations will be developed to control improper or hazardous development.
- Guidelines for site investigations of lands that are questionable as to buildability, i.e., slope, soil stability, water table, will be developed.
- Mineral and aggregates extraction ordinances will be developed.
- Guidelines for proper forest lands management will be prepared to maintain land condition.
- Guidelines establishing drainage and erosion criteria will be developed.

M A P   N O T E

SUB-ELEMENT:           LAND

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP  
DEPICTING THE FOLLOWING ITEMS:

## GEOLOGY -

Alluvial Deposits  
Fluvial Deposits  
Basalt Flows  
Siltstones  
Known Faults  
Hydrothermal Alterations  
Minerals and Aggregates

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OFFICE.

M A P N O T E

SUB-ELEMENT:           LAND

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP  
DEPICTING THE FOLLOWING ITEMS:

SOILS -

U. S. Soil Conservation Service  
Capability Classes

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M A P N O T E

SUB-ELEMENT:           LAND

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP  
DEPICTING THE FOLLOWING ITEMS:

TOPOGRAPHY -

Contours

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## A I R   S U B - E L E M E N T

## Air - History (1)

For many years, Klamath Falls' main industrial activity has been linked with lumber and lumber products manufacturing. In decades past, a number of sawmills were located in and near the city. As was the custom of the era, wigwam waste burners were a common fixture at each mill site for the elimination of wood wastes from the mill. Steam generators at most plants used wood-fired (hog fuel) boilers but no pollution control devices. As a result, wood smoke and associated particulate from milling operations were a consistent problem during times of air stagnation.

Economic factors, fires, and competition for available timber caused a decrease in the number of mills in the area. Changes in the utilization of wood residues and, more recently, implementation of state emission standards has eliminated most wigwam waste burners and has required particulate control equipment on boiler plants. Currently, annual timber products production is far greater than in the past, but the quality of air in the Basin is higher.

As early as July 1920 concern for the quality of air of Klamath Falls was evident in the City's passage of Ordinance No. 510, pertaining to operation of incinerators within the city. Airborne particulate problems caused by storage of sawdust and hog fuel led to the issuance of Ordinance No. 2087 in May 1930, making it unlawful for more than 200 cubic feet of sawdust or hog fuel to be piled without enclosing or covering it. Combustion particulate problems experienced early in 1942 were responsible for the passage of Ordinance No. 3420, regulating airborne emissions from chimneys, smokestacks, burners, and furnaces.

In August of 1957, as a result of state legislation, the State Sanitary Authority, through its Air Pollution Authority, invested legislative powers in the cities and Klamath Falls subsequently adopted Ordinance No. 4948. The main purpose of the ordinance was "to prevent and abate nuisance, and to make necessary regulations to secure the health and welfare of its residents, including the regulation of air pollution caused by smoke, cinders, raw or partly burned sawdust, particulate matter, noxious acids, fumes and gases."

## Air - History (2)

Enactment of the 1970 Federal Clean Air Act Amendments by Congress required the various states to submit implementation plans which would delineate the means they would use to meet the ambient air standards set forth in the Federal regulations. The following table lists the Federal standards and the State of Oregon standards for those pollutants of primary concern at the time.

In conjunction with the Federal concern for ambient air quality, the State of Oregon established a monitoring site at the Klamath Falls Central Fire Station in 1970. Total Suspended Particulates (TSP) were measured and beginning in 1974 sulfur dioxide ( $\text{SO}_2$ ) levels were also monitored. Tabulated data below and on the following page show the results of these measurements numerically and graphically respectively.

TSP and  $\text{SO}_2$  Concentrations  
Measured in Klamath Falls

Ambient Air Quality ( $\mu\text{g}/\text{m}^3$ )						
Total Suspended Particulates				$\text{SO}_2$		
Year	Annual Geometric Mean	24-Hour Maximum	Average 2nd High	*	Annual Arithmetic Mean	24-Hour Maximum
1970	67.9	195	189	6	----	----
1971	80.3	207	200	4	----	----
1972	70.1	251	245	4	----	----
1973	64.0	295	205	1	----	----
1974	78.4	228	222	4	13.1	14.0
1975	58.9	265	147	1	13.1	13.1
1976	65.3	200	190	5	14.1	65.0

\*Number of times  $150 \mu\text{g}/\text{m}^3$  was exceeded.

Air - History (3)



Total Suspended Particulate Trends  
Klamath Falls

- Legend
- Annual second highest value
- Quarterly average
- Running three-year average
- State standards



## Ambient Air Quality Standards for Oregon

Pollutant	Averaging Time	Federal Standards		State of Oregon Standards
		Primary (Health)	Secondary (Welfare)	
Suspended Particulate Matter	Annual Geometric Mean	75 $\mu\text{g}/\text{m}^3$	60 $\mu\text{g}/\text{m}^3$	60 $\mu\text{g}/\text{m}^3$
	24 hour	260 $\mu\text{g}/\text{m}^3$ *	150 $\mu\text{g}/\text{m}^3$ *	150 $\mu\text{g}/\text{m}^3$ *
	Monthly	--	--	100 $\mu\text{g}/\text{m}^3$ §
Carbon	8 hour*	10mg/m <sup>3</sup>		
	1 hour*	40mg/m <sup>3</sup>		
Sulfur Dioxide	Annual Arithmetic Average	80 $\mu\text{g}/\text{m}^3$	NONE	60 $\mu\text{g}/\text{m}^3$
	24 hour	365 $\mu\text{g}/\text{m}^3$ *	NONE	260 $\mu\text{g}/\text{m}^3$ *
	3 hour	NONE	1300 $\mu\text{g}/\text{m}^3$ *	1300 $\mu\text{g}/\text{m}^3$ *
Photochemical Oxidants	1 hour*	160 $\mu\text{g}/\text{m}^3$		
Nitrogen Dioxide	Annual Arithmetic Average*	100 $\mu\text{g}/\text{m}^3$		
Hydrocarbons (Non-Methane)	3 hour* (06-0900)	160 $\mu\text{g}/\text{m}^3$		
Lead	Calendar Quarter	1.5 $\mu\text{g}/\text{m}^3$	--	3 $\mu\text{g}/\text{m}^3$

NOTES: \* Not to be exceeded more than once per year.  
 § 24-hour average not more than 15% of the time.  
 $\mu\text{g}/\text{m}^3$  = micrograms per cubic meter  
 $\text{mg}/\text{m}^3$  = milligrams per cubic meter

## Air - Current Conditions (1)

Suspended particulates are sampled at the Klamath Falls Central Fire Station by high volume samplers. The Department of Environmental Quality (DEQ) collects the filters for weighing and calculating the percentage composition of each class of impurities. Federal and State regulations specify that the Total Suspended Particulates (TSP) levels are not to exceed those levels enumerated in the history of this sub-element. However, in Klamath Falls, as in several other eastern areas, several times each year high winds will carry dust and soil. During a windy period, the filters will capture the dust and soil particulates and the percentage of impurities in this 24-hour period will exceed the standard. The weight of the mineral matter in the sample may reach 30 percent dust and soil and 5 percent fragments of diatomaceous earth. Therefore, eastern Oregon may have as high a particulate count as New Jersey, as a result of the blown soil, but DEQ, recognizing the exceptional situation, has considered Klamath Falls to be in compliance with the standards.

Klamath Basin, because of its topography and climatology, can and has experienced major thermal inversions -- in effect, a temperature "lid" above the Basin, which prevents the rising of air currents, trapping them at or near ground level. The air which is trapped holds the pollutants from combustion of simple wood fires, of trash burners, and of the fuel within an engine; these pollutants can include particulate matter, sulfur oxides, nitrous oxides, and carbon compounds. When a temperature inversion occurs, it prevents these materials from escaping and causes air pollution problems. This inversion has occurred to some extent in the past. An increase in population and automobile traffic will create more air pollution problems for the Klamath Basin.

The measurement of sulfur dioxide began in 1974 in the Klamath Basin. Sulfur dioxide in the air is not harmful at the lowest level that is normally detectable in laboratory tests. At much higher levels, sulfur dioxide mixed with particulates is a danger to health. The danger may be visualized in that this level of concentration corrodes concrete and metal surfaces. The corrosion occurs because sulfur dioxide is soluble in water vapor and in solution becomes sulfuric acid.

## Air - Current Conditions (2)

Data generated by Wilsey and Ham show that estimated levels of carbon monoxide are potentially within violation range -- between 6 and 7 mg/m<sup>3</sup>, average, for eight-hour concentrations, an accurate measurement of the quality of air in our area. Of the seven monitoring receptors in the urban area, four are downtown: the County Courthouse, the Old City Library, and two locations on South Fifth Street. These show estimated eight-hour average CO concentrations of 6.3, 7.2, 3.6 and 6.6 mg/m<sup>3</sup> respectively. The other three sites are on South Sixth Street in the suburban area and these show estimated eight-hour average concentrations of 9.6, 8.3 and 7.6 mg/m<sup>3</sup>.

An emissions inventory for Klamath Falls and the urban area produced the concentrations of TSP and SO<sub>2</sub> shown in the following table. The inventory includes both mobile and stationary sources of pollutants. All stationary sources in the Klamath Basin have been tested and have at the time of testing demonstrated compliance with the Oregon State Emission Standards.

## Air - Current Conditions (3)

## Emissions Inventory of Klamath Falls Urban Area

Sources	Tons per Year	
	TSP*	SO <sub>2</sub>
<b>Timber Products Operations</b>		
Weyerhaeuser Company	1260.0	836.0
Columbia Plywood	117.2	0.0
Jeld-Wen	125.5	0.0
Modoc Lumber Company	80.1	0.0
D. G. Shelter Products	63.3	0.0
<b>Total Timber Products</b>	<b>1646.1</b>	<b>836.0</b>
<b>Transportation</b>		
Light duty motor vehicles	271.8	66.2
Heavy duty motor vehicles	64.8	94.1
Railroads	172.5	393.3
<b>Total Transportation</b>	<b>509.1</b>	<b>553.6</b>
<b>Space Heating</b>		
Kingsley Field	5.4	51.3
Commercial space heating	35.5	289.0
Residential space heating <sup>1</sup>	25.5	93.7
<b>Total Space Heating</b>	<b>66.4</b>	<b>434.0</b>
<b>Miscellaneous Combustion</b>		
Slash burning	99.3	0.0
Forest fires	122.0	0.0
Agricultural burning	87.6	0.0
<b>Total Miscellaneous</b>	<b>308.9</b>	<b>0.0</b>
<b>Metropolitan Impact Area Totals</b>	<b>2530.5</b>	<b>1733.4</b>

\*Total Suspended Particulates

<sup>1</sup>Does not include residential fireplace emissionsNoise

The Department of Environmental Quality has no noise monitoring sites in Klamath Falls, but several individual investigations have been made at commercial and industrial locations in the urban area. Sound is measured in decibels (dB), a unit for measuring the relative loudness of sounds. The following chart shows the decibel rating of specific sounds.

## Air - Current Conditions (4)

The Decibel Scale

0	Threshold of hearing
10	Normal breathing
20	Leaves rustling in a breeze
30	Empty movie house
40	Residential neighborhood at night
50	Quiet restaurant
60	Two-person conversation
70	Busy traffic
80	Vacuum cleaner
90	Water at foot of Niagara Falls
100	Subway train
120	Propeller plane at takeoff
130	Machine gun fire, close range
140	Military jet at takeoff
160	Wind tunnel
175	Future space rocket

Increments of 10 are used because the ear can detect the difference at this interval easily. Another factor used to describe the frequency of a noise is the number of times that a condition causing a noise will generate a noise beyond a standard level. Thus, the symbol  $L_{10}$  indicates that the level for an area, given in decibels, is exceeded 10 percent of the time. For instance, a survey by Wilsey and Ham rated the noise level of the downtown area of Klamath Falls during the time of heaviest traffic as  $L_{10} = 77$  dB. This indicates that the noise level was over 77 decibels 10 percent of the time, a figure which exceeds the criteria set by the Federal Highway Administration.

At peak hours, traffic noise along South Sixth Street was rated at  $L_{10} = 70$  but the site was 400 feet away from the street. When the noise was measured 100 feet away, it exceeded the federal design limit. Highway 97 at a point just north of the Green Springs junction had a rating of  $L_{10} = 78$  dB at the rush hour. The industrial area along the Green

## Air - Current Conditions (5)

Springs Highway showed  $L_{10} = 50$  dB. The noise at the junction of Joe Wright Road and Midland Highway was estimated at  $L_{10} = 59$  dB. Kingsley Field recorded a low of 40 dB which soared to 140 dB when military jets took off.

## Air - Problems (1)

- Wind-entrained dust from both vacant lands within the Urban Growth Boundary and from surrounding agricultural lands.
- Increasing auto emissions, especially concentrated areas of downtown and along South Sixth Street.
- Odor problems from eutrophication and algae on Upper Klamath Lake.
- Noise levels may be excessive in certain areas of downtown and South Sixth Street and along railroad lines.

#### Air - Future Alternatives (1)

- Auto emissions increase lowering air quality.
- Noise increases.
- New potential air-polluting or noise-polluting industries may want to establish in Klamath area.
- Increased air inversions serving to concentrate air pollutants.
- Development or similar encroachment into surrounding forest and agricultural lands will lower the filtering and air cleansing effects of these areas.
- Continued reliance on fireplace or wood stoves may result in air pollution problems or burning bans.
- Continued removal of vegetation in new developments can raise noise levels as these barriers are removed.
- Common carrier wreck in immediate urban area causes release of toxic gases or material into the atmosphere.



Air - Goals (1)

- Maintain and improve the quality of the air resources.
- To support and enforce regulations to properly manage the surrounding airshed.
- To protect and promote the standards necessary to prevent the exceeding of the carrying capacity of the air resources.

#### Air - Policies (1)

- Potential air pollution problems should be treated with the highest priority consideration and the National Ambient Air Standards will be met or exceeded.
- Reduce harmful effect of noise wherever possible.
- Manage land uses so as to minimize adverse noise effects, especially industrial situations.
- Support State and Federal efforts to establish effective noise control measures, including uniform motor vehicle standards.
- All waste and process discharges from future development, when combined with such discharges from existing developments, will not violate or threaten to violate applicable air quality regulations.
- Non-point sources of pollution will be controlled by enforcement of applicable Federal and State regulations.
- Where large areas of pesticide application or hazardous pesticides are to be used, the City or public must be informed prior to use. All use will be in accordance with State and Federal regulations.

## Air - Implementation Measures (1)

- Cooperate with and support DEQ in efforts to monitor and regulate air quality standards in the Klamath Basin.
- Conduct public education supporting the need for non-polluting activities in the city area.
- Seek funding for detailed monitoring program for pollutants and noise.
- Identify and control excessive noise sources.
- Continue to work towards removal of downtown truck traffic.
- Site planning for noise-generating uses will include building placement and landscaping techniques to insure minimum disruption.
- Eliminate open air burning of waste or refuse in the city.
- Develop disaster plan or program to ensure adequate response to sudden critical release of toxic or dangerous contaminants into atmosphere.
- Develop fireplace inspection program to ensure efficient combustion and minimum smoke emission.

M A P   N O T E

SUB-ELEMENT:    AIR

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP  
DEPICTING THE FOLLOWING ITEMS:

AIR QUALITY INDICES

MONITOR POINTS

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## W A T E R   S U B - E L E M E N T

## Water - History (1)

Klamath Lake

Freshwater fossils found around Stukel Mountain and ancient beach lines on the water-smoothed rocks above Fort Klamath indicate that at one time Klamath Lake covered an extensive area. To the northeast, a lava flow from Mount Scott or an adjacent crater dammed another lake. Subsequent water action cut a canyon, now the Williamson River, and drained that lake so now Klamath Marsh is all that remains.

Until man's intrusion, a natural basalt dike held the water of Upper Klamath Lake in their bed. The outflow of the lake tumbling over this barrier formed the original "Klamath Falls". The lake covered more area a century ago than it does now, because diking has reclaimed several thousand acres of outlying marsh for agriculture.

Early mention of the lake appears in such sources as the reports from Peter Skene Ogden, the 1826-27 Hudson's Bay Fur Brigade, John C. Fremont, and the 1854 Railroad Survey. Descriptions of the lake in 1875 and 1879 picture it as 20 miles wide and 40 miles long, a beautiful sheet of water dotted with islands and surrounded by heavy forests of timber and productive valleys.

Klamath Lake is in the later stages of eutrophication, a natural aging process that man has accelerated by his addition of nutrients to the lake's watershed. The lake was already teeming with algae in the late 1800's, indicating an advanced stage in the dying cycle a hundred years ago.

On April 20, 1904, Klamath Lake reached its highest recorded level of 4,144.98 feet above mean sea level. Its lowest recorded level was October 30, 1944, when it dropped to 4,135.55 feet above mean sea level. However, local legend declares that once the river channel itself became visible, the lake was so low. The dam built at the head of Link River (1919-21) gave man control of the water level and the half-million acre feet of water that could be stored in the lake.

## Water - History (2)

### Link River

This river, which the Indians called I-ulalona, forms the outlet from Upper Klamath Lake, and, in its course of less than two miles, carries the water to Lake Ewauna, dropping about 60 feet. There was another unique feature of the river before man's intervention -- it would occasionally be blown dry (twice according to old records). A strong, steady, south wind blowing up the canyon would hold back the waters of the lake and allow the river to become dry enough to cross without getting wet.

In 1904, soon after Klamath Lake reached its record high, Link River carried its maximum recorded flow: 9,400 cubic feet per second. In 1919, a temporary dam was built at the head of the river, and in 1921 the permanent dam was completed. The Link River has contributed greatly to the growth of Klamath Falls. Indians camped on its shores; a wall found on the bottom of the river is believed to have been an ancient fish trap. The earliest buildings in the town of Linkville lined the banks. Its flowing waters provided energy for sawmills and electric power, and proved a valuable fishing ground for both Indians and settlers.

### Lake Ewauna

The Link River flows into Lake Ewauna, which is actually a widening of the Klamath River and depends on the flow from Klamath Lake. Logs were stored in Lake Ewauna in the early days of the town; and boats plied its length. In 1966, the lake was dredged and four million cubic yards of material, including many old sunken logs, were removed from the lake bed.

### Klamath River

The Klamath River begins at Lake Ewauna and meanders across the valley floor, flows through a narrow pass near Keno, crosses into California and empties into the Pacific. The upper portion of the river flows through very level land, and, prior to the draining of Lower Klamath Lake in 1917, water in the Klamath Straits section would flow backwards. Several dams have been placed along the length of the Klamath River, and on

### Water - History (3)

April 17, 1957, Oregon and California ratified a pact concerning the development and use of this waterway. During the early 1970's the river was dredged between Lake Ewauna and Keno to increase capacity and lower flood hazards.

### Canals

In March, 1878, less than a decade after the beginning of Linkville, the Linkville Water Ditch Company began using the waters of Klamath Lake for surface irrigation. The Ankeny Canal was the first water supply line into town; in 1884, Mr. William Steele bought it and extended it 15 miles into the Basin. By 1891, the Klamath Falls Irrigation Company owned this canal and several smaller ones.

The Klamath Project, under the terms of the Reclamation Act of June 17, 1902, began with the purchase of the existing canal systems by the Bureau of Reclamation in 1905. In 1905 bids were opened for the construction of nine miles of the main canal. This first phase of the construction project, completed in 1907, included the main "A" and "B" Canals to Olene and construction of the "E" and "F" Canals. The "C" Canal and the Lost River Diversion Channel were completed in 1911.

The average discharge for the "A" Canal for the past 64 years has been 261 cubic feet per second (cfs) or 189,100 acre feet per year (afy). However, flows have been increasing over the years: the averages for the past 30 years show a mean flow of 255,800 afy. Since the canal is full only half the year, flows as high as from 800 to 1,100 cfs do occur at times of heavy use. The highest flow in the canal, 1,180 cfs, occurred on June 24, 1961.

### Hot Springs

Hot springs have been an integral part of the Klamath Basin. The Indians recognized the value of the hot water before the early settlers made use of it. In addition to recognizing the cooking aid provided by the hot water, they also had great faith in its healing powers. Thus, crippled and aged were brought long distances to be cured of their ailments by soaking in the overflow pools from the springs.



## Water - History (4)

Many of the springs have disappeared through a lowering of the water table and changing cultural trends. Gone is the Devil's Teakettle, a deep funnel-shaped hole east of town, with water boiling at the bottom. Gone, too, is Big Springs, now Modoc Field, which was used as a picnic spot and had a covered pavillion with seats around the side. Over the years, several bathhouses were constructed adjacent to Big Springs, providing natural steam baths, mineral water baths and swimming. Steam still appears there and the ground is wet year around.

Other springs were located on either side of Main Street about where the Municipal Swimming Pool is now located. The early settlers followed the traditions of the Indians, using all of these natural source of heat for cooking meat and vegetables, bathing, and keeping warm. Several springs spread southeastward from the city in what is now the Mills-Shasta Plaza area. These formed warm marshy areas that became bird refuges when the rest of the land was forzen. The overflow from the springs made warm water streams, along which vegetation was ever green and flowers bloomed year around. Hot springs can still be found throughout much of the Basin, many existing as they did before the advent of civilization.

### Groundwater

Although annual precipitation is low in the Basin proper, heavy mountain snow packs, the permeability of the soils, and the excellent underground aquifer capabilities give Klamath County a good supply of groundwater, the major source of drinking water for the Basin's residents. Initially, artesian wells supplied much of the city's drinking water; later wells were dug and these, with additions over the years, continue to tap the groundwater sources to provide abundant supplies of water for the area.

## Water - Current Conditions

Klamath County has a wealth of natural lakes and reservoirs: 114,840 surface acres of open water in the county. Twenty-four lakes exceed 200 surface acres.

### Upper Klamath Lake

The dominant feature of the Klamath Basin is Upper Klamath Lake, a natural body of freshwater covering over a hundred square miles. The Williamson and Wood Rivers and numerous creeks and springs flow into the lake. The dam at the head of Link River controls the outflow, approximately half a million acre feet of water.

Location	Lat. 42°15' N; Long. 121°48' W; Covering parts of T36S-R7E and T36S-R8E
Maximum surface level	4,143.3 feet above mean sea level
Minimum surface level	4,137.0 feet above mean sea level
Total volume at 4,143.3 feet	872,200 acre feet
Active storage volume at 4,143.3 ft.	462,400 acre feet
Active storage volume at 4,137.0 ft.	Zero acre feet
Total storage below 4,137.0 feet	409,800 acre feet
Surface area at maximum (average)	89,500 acres
Surface area at minimum (average)	63,000 acres
Average depth	8 to 10 feet
Maximum depth (off Eagle Ridge)	35 to 55 feet with one area 86 ft.
Average length of shoreline	95 to 105 miles
Total drainage area	Over 3,800 square miles

Upper Klamath Lake is eutrophic -- rich in dissolved nutrients -- and highly productive in phyto- and zooplankton. The algal blooms thrive from early spring to late fall on the nutrients in the lake. The principal nutrients -- phosphates, nitrogen, iron, calcium, aluminum, boron, manganese, silicon and sulfur -- are supplied through the natural geologic structures. The towns and farms increased the contamination of the lake and accelerated the eutrophication process, but this recent contamination plays a minor part in the process.

Visible algal growth during the warmer months include five major species of nuisance blooms. Zooplankton is found in abundance, and the fauna found on the lake bottom range from minute nematodes to mussels and crayfish. Aquatic insects and aquatic insect larva are not extensive in the lake proper but are associated with rocky shorelines and marsh areas.

## Water - Current Conditions (2)

Klamath Lake has many uses for man's benefit: flood control, such recreation as swimming, boating, water skiing and fishing, and almost 500,000 acre feet of water for hydroelectric power and the irrigation of over 220,000 acres of farm land.

### Link River

This waterway, approximately one mile long, has the unique distinction of being completely within the confines of a municipality, lying, in its entirety, inside the city limits of Klamath Falls.

The river has a mean flow of 1,062,520 acre feet per year (1920-1976 average) of water. According to a gage-water stage recorder located about midway down the canyon, the surface level of the river ranges from 51.50 feet minimum to 59.59 feet maximum level below the surface of the lake.

A dam at the head of the river controls the level of Upper Klamath Lake, the flow of the river, and the flow of the diversion structure, the Keno Canal. The latter has, since 1908, carried water from the dam to the hydroelectric plant and back to the river channel. This power plant causes a large diurnal fluctuation in the flow. The water quality of the river is about the same as that of Klamath Lake.

### Lake Ewauna

This lake, receiving the flow from Link River, is shallow, with a mean depth of about five feet (depending on the elevation of the dam downstream at Keno), broadening from the inflow of the river to approximately 3,000 feet in width, then tapering southward for about 9,000 feet; this lake forms the headwaters of the Klamath River.

Lake Ewauna receives water from two wastewater treatment plants which have effluents high in nitrates and phosphates. Water velocities are low, and, during the summer months, temperatures rise, dissolved oxygen levels fluctuate wildly on the diurnal cycle, and phytoplankton flourish. Nutrient levels, turbidity and alkalinity levels and pH are often undesirably high during these warm months. Coliform counts are considered too high for water contact recreation, but because of the lake's proximity to town and accessibility, rowing or sculling, and fishing are popular.

## Water - Current Conditions (3)

### Klamath River

The Klamath River forms the outlet for the Klamath Drainage Basin, leaving at the southwest corner and flowing across California to the ocean. At Keno a dam controls the flow and elevation of the upper part of the river. Between Klamath Falls and Keno four facilities intersect its route: the Klamath Straits Drain, the Diversion Channel, the North Canal and the Ady Canal. The two latter canals serve Klamath Drainage District lands in Oregon and Lower Klamath Refuge lands in Oregon and California. The Klamath Straits Drain carries water from Lost River and Lower Klamath Lake areas to the River. The Diversion Channel serves two purposes: from mid-October to mid-April, it carries excess water from Lost River to the Klamath River; during the irrigation season it carries water from the Klamath to the Lost River irrigation system to replenish low flows.

The water recorder 1.7 miles northwest of Keno shows a surface elevation of 3,964 feet above mean sea level. The average discharge of the Klamath River over the past 54 years has been 1,230,000 acre feet per year.

### Canals

The Bureau of Reclamation Project in the early part of the century coupled with private activities in irrigation have changed the Klamath Basin from arid semi-desert to fertile farm land.

The major source of irrigation water running through the City of Klamath Falls from Upper Klamath Lake is the "A" Canal. Drawing water from just above the Link River dam, the canal remains open for a short distance, then goes underground for over 3,000 feet before reappearing. Originally, this left the open canal outside of the populated area; however, the city has grown and now the canal meanders through several miles of urban area.

In winter months this canal is dry, but it carries water from mid-April to mid-October and has a monthly average flow of 36,543 acre feet. The "A" Canal and its branches irrigate lands on the east side of the Klamath River and both sides of Lost River. Drainage is primarily into Lost River. Other canals and irrigation systems extend throughout the Basin; water districts

#### Water - Current Conditions (4)

were formed to manage these supplies, Klamath Irrigation and Enterprise Irrigation serve the urban area.

#### Groundwater

Despite low averages of annual precipitation, Klamath County enjoys a supply of groundwater of good quality. Except for isolated instances, groundwater is the Basin's universal source of drinking water. The quality of the water serving the Klamath Falls area is generally excellent. Dissolved materials such as iron, silica, phosphates and nitrates affecting water quality are picked up as the groundwater moves through the cracks and fractures of the solid rock or through the spaces between rock particles. In a few areas, such as Keno and Henley, some problems with these have occurred, but the wells serving the major urban population require little or no treatment to insure potability.

Well depths vary from artesian to several hundred feet, depending on the geology of the area. Flows also vary according to the lithologic units of the aquifer, with several thousand gallons per minute available from some aquifers. Four main aquifer units have been defined for this area.

Name	Lithologic Units	Waterbearing Characteristics
Sedimentary aquifer	Sand, clay, shale, gravel sediments	Poor
Volcanic center aquifer	Lava flows and cinders	Moderate to high
Lower Basalt aquifer	Basalt	High
Volcanic ash aquifer	Volcanic ash and sediments	Poor

Generalized aquifer information shows the Basin floor, including Klamath Falls, to be primarily sedimentary aquifer, dotted with some volcanic center aquifers. Because of the poor waterbearing property of the sedimentary rocks, many wells tap permeable basalt or cindery rubble beneath them. However, lines of fracture in faulted areas may produce hot and cold springs, both prevalent in the area (see Energy).

## Water - Current Conditions (5)

The approximately 6,700,000 acre feet of precipitation falling in the 5,700 square miles of the Klamath Basin each year is dispersed in several ways. Estimates show the following (data in acre feet):

Annual Acre Feet of Precipitation	Dispersions
6,700,000	Total precipitation
<u>5,048,000</u>	Evapotranspiration
1,652,000	
<u>1,205,000</u>	Surface water outflow
447,000	Groundwater
<u>347,000</u>	Groundwater pumpage
100,000	Groundwater outflow

The Basin normally receives more groundwater than it uses. To date, except in some specific areas, no serious water level declines have occurred. In some areas the use of ground water for agricultural irrigation is increasing. High pumping rates can exceed the recharge rate of aquifers. Proper development of groundwater supplies is necessary to prevent excessive decline of groundwater levels.

## Water - Problems (1)

- Upper Klamath Lake, Link River, Lake Ewauna, and various major irrigation canals all serve to create flood hazard potentials in certain low-lying lands.
- The true character and limits of the municipal groundwater source has never been properly investigated.
- There exist several points of potential pollution present in surrounding natural waters.

Waste Discharge by Receiving Body				
Source	Upper Klamath Lake	Link River	Lake Ewauna	"A" Canal
Municipal waste			x	
Sludge deposits			x	
Industrial wastes	x		x	
Urban drainage	x	x	x	x
Vessels and marinas	x		x	
Construction practices	x	x	x	x
Logs and log rafting			x	
Septic tanks	x			

- Possible non-point sources of water discharge in city area have not been identified.
- The water quality of Upper Klamath Lake, Link River, Lake Ewauna, and Klamath River is creating problems in meeting PL 92:500 Water Quality Standards.
- The water storage capacity in Upper Klamath Lake is steadily diminishing while demand increases for water uses by industry, agriculture and recreation.
- Inefficient water use with individual wells, many with poor construction and low standards can lead to contamination of potable water supplies.

Water - Problems (2)

- Drainage inflow to the older, inadequately designed capacity canals is greater than the capacity of such canals and thereby contributes to flood hazards.
- Open canals create public safety hazard and contribute to mosquito and midge numbers.



D E T A I L E D   A S S E S S M E N T   N O T E

SUB-ELEMENT:            WATER

THE CONTENT OF THIS SUB-ELEMENT IS SUPPLEMENTED BY THE FOLLOWING DETAILED ASSESSMENTS WHICH WILL BE ADOPTED BY REFERENCE WITH THE COMPREHENSIVE PLAN.

OREGON DEPARTMENT OF ENVIRONMENTAL  
QUALITY KLAMATH BASIN WATER QUALITY  
MANAGEMENT PLAN

OREGON WATER RESOURCES DIVISION  
KLAMATH BASIN REPORT

COPIES OF THESE ASSESSMENTS MAY BE AVAILABLE FROM THE ORIGINATING AGENCY OR CAN BE INSPECTED AT THE CITY PLANNING DEPARTMENT OFFICES.

### Water - Future Alternatives (1)

- The eutrophication of Upper Klamath Lake continues but may be reduced by means of modifying recreational and other uses of the lake.
- The eutrophication of Upper Klamath Lake may increase, resulting in less water available, fish kills, algae blooms, odor, and increased numbers of mosquitoes and midges.
- The quantity and quality of groundwater changes due to improper uses of drawdown on wells.
- Federal or State water quality standards may change and thereby cause reduced discharges into natural waters.
- Natural hazard or catastrophe may contaminate potable water supply or wells and create the need for new water sources.
- Heavy agricultural use of groundwater for irrigation will continue.
- The consolidation of potable water resources in urban area will possibly occur.
- Natural waters may be contaminated due to an accidental spillage of toxic material or other disaster.

**Water - Goals (1)**

- To maintain and improve the quality of the water resources of the community.
- To protect life and property from water-related natural disasters and hazards.

## Water - Policies (1)

- Potential water pollution problems should be treated with the highest priority.
- All waste and process discharges from future developments, when combined with such discharges from existing developments, will not violate or threaten to violate applicable water quality regulations.
- Water-related hazards such as flooding will not necessitate disapproval of development, but higher development costs can be expected in order to minimize hazards.
- Development in floodplains will be inversely proportional to the proximity to the floodplain channel, i.e., lowest density occurring on lands nearest the channel.
- The City will try to provide support to any efforts to clean up Upper Klamath Lake and reduce the eutrophication process.
- Discharge standards relating to City-owned sewer facilities will be maintained.
- A disaster plan relating to major contaminations or spills of dangerous materials into natural waters will be maintained.
- All lands designated as areas of special floodplain will be urbanized only in accordance with an adopted floodplain management program.

## Water - Implementation Measures (1)

- The City will cooperate with and support efforts by the Department of Environmental Quality to monitor and regulate water quality standards in the Klamath Basin.
- Public education programs supporting non-pollution and describing the needs or concerns of the City relative to water quality standards will be conducted.
- The City will continue participation in the Flood Insurance Program as administered by the Federal Insurance Administration.
- The City will continue to work with the Corps of Engineers' efforts to monitor possible point source pollutants and identify non-point sources.
- A survey of groundwater resources will be sought.
- The development of new water storage capacity of Upper Klamath Lake water will be encouraged.
- A disaster plan relating to major water pollution problems will be developed.
- Floodplain management regulations will be developed and included within the Community Development Ordinance.
- The City will cooperate with and support the Oregon Division of State Lands in their regulatory efforts pertaining to Upper Klamath Lake and Lake Ewauna.

M A P N O T E

SUB-ELEMENT:

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP  
DEPICTING THE FOLLOWING ITEMS:

SURFACE WATER BODIES

FLOODPLAINS

THIS MAP CURRENTLY EXISTS IN ROUGH DRAFT ONLY AND IS NOT  
AVAILABLE FOR REPRODUCTION. HOWEVER, DRAFT COPIES ARE  
AVAILABLE FOR INSPECTION AT THE CITY PLANNING DEPARTMENT  
OFFICE.

M A P N O T E

SUB-ELEMENT: WATER

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP  
DEPICTING THE FOLLOWING ITEM:

GROUNDWATER MOVEMENTS

THIS MAP CURRENTLY EXISTS IN ROUGH DRAFT ONLY, AND IS NOT  
AVAILABLE FOR REPRODUCTION. HOWEVER, DRAFT COPIES ARE  
AVAILABLE FOR INSPECTION AT THE CITY PLANNING DEPARTMENT  
OFFICE.

## CLIMATE SUB-ELEMENT

## Climate - History (1)

Records of weather data were begun under the U. S. Army Signal Corps in the town of Linkville in January 1884. The Corps made observations for four years and precipitation records for this period are available. Over the next 14 years, records were kept by individuals at various locations around the town but they are spotty prior to 1901. In 1908, the U. S. Bureau of Reclamation began its weather observations and, except for the years 1927, '28 and '29, it kept them continuously until October 1947. The station moved to several different locations, but all were in the downtown area. During the years 1927 through 1929, the Southern Pacific Railroad Company took the readings at its freight depot. In October 1947, the California-Oregon Power Company became the official weather observer and its power plant was the station. After buying this power company in 1961, Pacific Power & Light continued the observations. The following page contains the names of the observers, the dates of their services and, where known, the locations of their stations are listed.

Five miles south of this downtown site is the meteorological station at the airport. Put into operation in October of 1943, it has almost continuous records from that date. The data from the downtown station and that from the airport differ somewhat due to the differences in location, but, generally, they coincide.

There is a range of 130<sup>o</sup>F between the maximum and minimum temperatures on record for the urban area. The highest recorded reading was recorded one July day when the temperature soared to 105<sup>o</sup>F. The lowest was a -25<sup>o</sup>F at the airport station in January 1962; this was rivalled 10 years later when the mercury dropped to -22<sup>o</sup>F in December 1972. Extremes are rare and temperatures, even when high during the day, drop sufficiently to provide cool nights throughout the summer months. Only once, between July 25 and August 3, 1973, did the daily maximum exceed 90<sup>o</sup>F for ten consecutive days.



## Climate - History (2)

Observer	Period of Service	Station Location
U. S. Army Signal Corps	Jan. 1884-Dec. 1889	Unknown
G. V. Farnsworth	Mar. 1894-Nov. 1895	Unknown
W. E. Bowcein	Dec. 1897-Jun. 1898	Unknown
Otto & Anna Heideich	Jun. 1898-Jun. 1900	Unknown
Marion Hanks	Oct. 1900-Mar. 1906	Junction of Upper Klamath Lake and Link River
Marion Hanks	Mar. 1906-Mar. 1908	8th and Pine
Ernest Jacobson	Apr. 1908-Nov. 1908	Probably 9th and Pine
U.S. Reclamation Service	Dec. 1908-Apr. 1912	U.S. Reserve in City*
U.S. Reclamation Service	Apr. 1912-Oct. 1912	430 Washington*
U.S. Reclamation Service	Oct. 1912-Jan. 1927	Reclamation Service Office*
Southern Pacific Railroad	Jan. 1927-Jan. 1930	Railroad Freight Depot
U.S. Reclamation Service	Jan. 1930-Oct. 1947	Bureau of Reclamation Garage
COPCO	Oct. 1947-Sep. 1961	Power Plant 10 Blocks SSW of Post Office
PP&L	Oct. 1961 to date	Old COPCO Power Plant

\*These three locations may all be the same; if not, they were all within a radius of a few blocks of each other.

The maximum wind velocity on record is 57 knots (65.5 mph) in October, 1962, but the winds were strong enough on August 29, 1907 to hold back waters in the flume to the electric plant on Link River, disrupting service for an hour. Also, it was reported that on at least two occasions the winds were sufficient to hold back the waters from Link River. It is said that shortly after the turn of the century, a concentrated force of moving air created a water spout that moved inland near Odessa -- destroying boats, cabins, and a 50-foot width of trees before moving back into the lake and dissipating. Ordinarily, winds are light, averaging only 5.1 miles per hour in the urban area. No tornadoes have ever been recorded in or around the City.

The year 1948 saw the highest rainfall in Klamath, with a total of 20.91 inches; the following year, it dropped to 8.32 inches. Only in two

## Climate - History (3)

other years, 1959 and 1976, were the annual totals less -- 7.31 inches and 7.93 inches respectively. However, the yearly weather patterns do not always fit the calendar year, and from September 1, 1957, to August 31, 1958, total rainfall was 23.09 inches, a new high, and between September 1, 1976 and August 31, 1977, only 6.42 inches of precipitation were recorded. Although setting no annual records, from 1928 to 1932 the average rainfall was only two thirds of the normal 14 inches, or approximately 9.5 inches per year for four consecutive years.

Months without rain does not necessarily indicate a drought -- Klamath Falls went 138 days with no precipitation in 1951, yet the yearly total was above average. The most moisture ever to fall in any one day was 2.44 inches on December 22, 1964; this coincided with one of the major floods of the area. Not surprisingly, the total precipitation for that month was a record 8.93 inches.

Snowfall is a topic dear to the hearts of old-timers and stories of exceptional snowfalls abound. Records show, though, that snows of yesteryear were not much different from those today; it just seemed like more because no roads were ever plowed. It does appear, although it is unsubstantiated by any local official records, that the winter of 1889-1890 may have had snows over five feet deep. Military roads from Fort Klamath and local letters substantiate the estimated five-foot accumulation. The most snow on record to fall over the course of one winter in Klamath Falls was 100 inches in 1955-56, and the most accumulated at any one time was 28 inches in January of 1950. The earliest measurable snow of the season was September 26, 1971, and flakes have fallen, at one time or another, in every month of the year.

Klamath is known, however, as the land of sunshine and so it is, with January the only month of the year that the sun shines less than one third of the daylight hours. The measure of solar radiation is a Langley which equals 1 gm calorie/cm<sup>2</sup> or 3.69 BTU's per square foot. The daily averages for Langleys in Klamath Falls range from 125 in December to over 600 in July.

## Climate - Current Conditions (1)

The proximity of the Pacific Ocean moderates the climate of the Basin somewhat from the extremes that are normal at this altitude. The air masses moving in from the west must rise above the Cascades. This rise causes rain to fall on the western slopes, leaving little moisture for the Basin. This westerly air flow is the primary source of the weather in the Basin, although severe thunder storms do occur locally during the summer months.

While wind speeds of 30 miles per hour or greater have been observed in every month of the year, the average wind speeds for Klamath Falls are relatively low. Only two months, December and January, have average wind speeds of over 7 miles per hour. Six months, May through October, have average wind speeds of less than 5 miles per hour. The yearly average wind speed for the area is 5.1 miles per hour.

Temperatures of the urban locality fall within a 130°F range, but the extremes are rare. Average temperatures cover a much narrower span, the average daily highs were slightly over 84°F and lows averaged 21°F during the year. (See Fig. 1.)

Fig. 1. Temperature Data

## Climate - Current Conditions (2)

During periods of both high and low temperatures, the relative humidity is unusually low, making the climate comfortable. This low humidity, coupled with the warm summer temperatures results in a high evaporation rate for the area, averaging as high as 10.5 inches of water evaporation in the month of July. Because of the rapid drying of surface soils, winds often carry a high particulate load of dust where they sweep across the open fields and lift the topsoil; fortunately, irrigation and summer showers offset this pattern.

Precipitation for the urban area is generally between 9.5 and 17 inches a year, with an average of 14.06 inches. Approximately 70 percent of this falls in the six months between October and March. Numerous years show one or more summer months with no or only traces of moisture falling. High and low records and averages are shown in Fig. 2.

Fig. 2. Precipitation Data 1905-1977

## Climate - Current Conditions (3)

Much of the precipitation that falls in the winter is in the form of snow, and, although unusual, snow has fallen during the summer months also. High and low records are shown in Fig. 3.

Fig. 3. Snowfall Data

There is a high temperature percentage of sunny weather in the months of May through October -- often approaching 90 percent of the time possible in July. The average amount of solar energy reaching the area is given in the Energy section of this plan. January is generally the most cloudy month

#### Climate - Current Conditions (4)

of the year, with an average of over 80 percent cloud cover, while July shows an average of only about 12 percent.

Soil temperature plays an important part in the agriculture of the Basin. In order to obtain maximum germination and/or growth of seeds, the soil temperatures should be 50°F to 85°F for corn/ 60°F to 70°F for potatoes; 40°F to 50°F for wheat and 80°F for melons.

The application of fertilizers such as anhydrous ammonia is most effective when the soil temperature is at least 50°F. Measured four inches below the surface of the ground, the temperature averaged 40°F for March, 70°F in July, and 40°F in November. Thus it can be seen in part why there is such a critical concern by agriculture with the length of the growing season and soil temperature.

Despite late frosts, dry summers and a growing season of only 90-120 days, the sunshine, good precipitation in watershed areas and warm soils allow a wide variety of hardy crops to be grown in the Basin, coupling climate to the economy of the area.

A final area of concern that should be considered is the effect that urbanization has on certain aspects of local climate conditions. This is illustrated in the following table.

Average Changes in Aspects of Local Climate Caused by Cities

Aspect	Comparison with Rural Environment
Cloud cover	5%-10% more
Winter fog	100% more
Summer fog	30% more
Precipitation	5%-10% more
Summer relative humidity	8% less
Winter relative humidity	2% less
Total radiation	15%-20% less
Ultraviolet radiation	5%-30% less
Annual mean temperature	0.5°-1°C more
Average winter minimum temperature	1°-2°C more
Mean wind speed	20%-30% less

Source: H.E. Landsberg, Man-made climate changes, SCIENCE, vol. 170, pp.1265-1274 (December 18, 1970).

## Climate - Problems (1)

- Light average winds, coupled with local topography, will result in a potential for air stagnation and pollution problems.
- Snow causes annual inconveniences and hazards to motorists, as well as extra costs for removal, particularly in downtown areas.
- Ice is a periodic hazard on streets, particularly those steeper streets in the city.
- The general severity of winter conditions constitutes significant need for well-insulated and properly weatherized housing units to lower energy needs and reduce costs.
- Winter conditions occasionally curtail most construction activities, with subsequent economic hardships.
- Climatic conditions create major crop damage and adversely affect the economics of the agricultural base of the area.

## Climate - Future Alternatives (1)

- No climate trends are currently discernable.
- Various cycles of weather which could cause problems of concern include:
  - Drought strikes result in water supply problems and economic effect on community.
  - Extreme or unseasonal rainfalls cause flooding along designated floodplains -- extensive physical and economic damage could occur or cause agricultural losses.
  - Severe winter weather or continued cold cycle could cause increased costs for street maintenance, energy costs and availability.
  - Major frost damage to agricultural crops in area could cause economic slump due to losses.
  - Tornado could strike a populated area causing major damage.



**Climate - Goals (1)**

- To conserve and develop community resources in consideration of climatic conditions.

## Climate - Policies (1)

- Future public capital improvements will be designed in consideration of climatic circumstances that may create hazards, inconveniences, or additional maintenance costs.
- The City will try to improve the methods of snow and ice removal from City streets.
- The City will try to support the efforts for incentives to persons properly weatherizing houses and buildings to reduce energy needs.
- Future streets and roads should be planned to provide the quickest snowmelt and the best snow removal possible to prevent traffic problems during and after storms.

## Climate - Implementation Measures (1)

- The City will coordinate with U. S. Weather Service to keep accurate records and new trends in the weather cycle.
- Guidelines for both new construction and rehabilitation of older homes for efficient weatherization will be developed.
- More budget consideration should be diverted to adequate snow and ice removal.

## W I L D L I F E   S U B - E L E M E N T

## Wildlife - History (1)

Wildlife has always been plentiful and varied in the Klamath Basin. In the prehistoric period, a profusion of animals such as the camels, rhinoceros, three-toed horse (miohippus), saber-toothed tiger, giant ground sloths, bison, peccaries, and tapirs lived in the semitropical climate of the Basin. An ancient mammoth tusk was found in the gravel pit on Stukel Mountain; tracks and later the complete skeleton of a mammoth were found in 1922 on the bottom of Tule Lake when it went dry. The remains of camel bones were also found near Merrill several years ago. Of course, the more conventional types of wildlife, as wolves and antelope, were here also.

When settlers arrived, they found an abundance of many species of animals. The eastern shore of Klamath Lake formed a habitat for several types of chipmunks, badgers, ground squirrels, coyotes, many deer (black-tailed, white-tailed, and mule), and some antelope. High in the deeper canyons were elk, bear (black, cinnamon, and grizzly), the lynx, gray wolves, silver, red and gray foxes, cougar, and wolverine. Around the perimeter of the lake there abounded beaver, otter, mink, wood chucks (marmots), raccoons, and skunks. The kit fox and desert bighorn sheep were found in the desert areas.

Klamath Lake and its adjacent waterways is the northern limit for southern birds and the southern limit for northern birds -- then, as now, there were extensive seasonal migrations. Flocks of waterfowl -- ducks, geese, pelicans, heron, and crane lived on and around the lake. Mallard ducks, Canadian and white geese, white swans, coots, loons, peregrine falcons, fish-hawks, bald eagles, marsh hawks, sage hens, blackbirds, owls, larks, woodpeckers, pigeons, mockingbirds, from the largest raptor of the area, the golden eagle, to the smallest, the tiny hummingbirds, all were part of the lake environment.

Other wildlife, less welcome, was in abundance in the early days of Linkville. Snakes, both harmless and poisonous, were found in great numbers: garter, blue racer, black bow, water, and rattle snakes. They were so numerous as to form large masses along Link River and in the

## Wildlife - History (2)

rocky areas, and their habitats stank. The influx of human population, the extension of the canal systems, and the subsequent treatments to remove vegetation dispersed them and decreased their numbers over the years.

Fish have been of great importance to the Klamath Basin. They were a main food staple of the Indians -- Cressman, (1956) through archaeological investigations, deduced that as far back as 3,500 years ago fish constituted the major item in the diet of the local inhabitants. Fish migrations provided the Indians with food and ancient bones found in the Sprague River Valley have been tentatively identified as those of Chinook salmon.

A 1905 report states that "In the Upper Klamath Lake and Link River seven varieties of steelhead trout have been caught ranging in weight from a few ounces to 16 pounds. In the Klamath River ... the fall fishing for salmon, salmon trout and silverside trout is exceptionally fine." Link River was a superb fishing ground until the dams on the lower Klamath River stopped the runs. The runs of fish returning from the ocean to the mid- and upper Klamath Basin were curtailed after 1910 when the Bureau of Fisheries installed its racks at Klamathon. The completion of COPCO Dam in 1917 blocked the upstream migration completely. At the time of the dam's construction, fish ladders over high dams were not considered feasible. Construction required no Federal or State licensing at that time and so the dams were built with no thought for wildlife.

Civilization's intrusion into the Basin has had an effect on the wildlife and, overall, it has changed or destroyed habitats and reduced populations. Marsh habitat alone has been reduced by approximately 90 percent. However, man's effect is not always detrimental to nature. Before the turn of the century, stocking fish in the Klamath River and its tributaries had begun. Records show that in 1890, 19,000 Chinook fry were placed in the Klamath River and in 1908, one half million each of rainbow and eastern brook trout and one million small salmon were released in the Klamath River system.

One of the Basin's most popular game birds, the pheasant, is not indigenous to the area. In 1912-13, a few of the birds were brought in to

### Wildlife - History (3)

see if they could survive. They did, and on August 24, 1914, 200 Chinese pheasants brought over the mountains from Corvallis were released in the fields around the city. They and additional transplantings have thrived and each fall hunters flush these birds in relatively large numbers; however, here again, the increase in population and the building of houses and businesses are removing the habitat and reducing the numbers of birds.

To help combat indiscriminate slaughter of game animals, the Oregon Legislature passed game laws for the state, and on May 27, 1909, the Fish and Game Commission made licenses mandatory for those who wished to hunt and fish in Oregon.

Wildlife populations fluctuate naturally in accordance with food supplies. The extent is not known, but it appears that the mass death of fish in 1971 affected for a short term some of the bird populations. Such natural occurrences, coupled with man's contributions, markedly decrease the numbers of some species. In contrast, some of the endangered groups are making a comeback. Swans, a bird rarely sighted in this area for many years, are now being found in much greater numbers. Migrating bald eagles winter in the Basin each year; once seldom seen, nearly 500 were sighted during one day in 1977. Eagles were very prevalent along the west side of Lake Ewauna years ago until beaver activity removed their perching habitat.

Another step in conservation was the creation of an animal refuge along Link River by Pacific Power & Light several years ago; a trail was established along the west bank of the canyon at that time. In addition, PP&L has allowed the land to return to a natural state and conservationists have built nesting boxes for purple martin and other birds and mammals.

## Wildlife - Current Conditions (1)

The Klamath Basin has excellent wildlife populations. Over 50 species of mammals and more than 30 different reptiles have been identified in the county. The following have been found within the urban area.

Species	Average Abundance	Species	Average Abundance
Mule deer	Medium	Belding gr. squirrel	Medium
Black-tailed deer	Few	Cal. gr. squirrel	Few
Silver gray squirrel	Few	Gold. mantled squir.	Medium
Beaver	Few	Townsend chipmunk	Few
Muskrat	Medium	Yellow pine chipmunk	Medium
River otter	Few	Hermann kangaroo rat	Few
Mink	Few	Dusty foot woodrat	Few
Coyote	Medium	W. pond turtle	Medium
Red fox	Few	Rattlesnake	Few
Raccoon	Few	Rubber boa	Few
Striped skunk	Medium	Gopher snake	Medium
Spotted skunk	Few	Common king snake	Few
Badger	Few	Garter snake	Medium
Shorttail weasel	Few	Western skink	Few
Porcupine	Medium	Bullfrog	Medium
Marmot	Medium	Spotted frog	Few
Mtn. cottontail	Few	Northwestern toad	Medium
Blacktail j'rabbit	Medium		

The spreading of urban growth disrupts various habitats and the above inventory and abundance data are not empirical. However, an animal survey conducted by the Klamath Basin Nature Society and the Ponderosa Junior Historical Society indicated the presence of a wide variety of small animals within the urban area.

For the county many of these animals have some economic significance. Furbearing animals yielded almost 27,000 pelts valued at over \$137,300 in 1976. Game mammal harvest for that year was recorded at 5,171 with a recreational value in excess of \$2,800,000.

No area of similar size of the Basin in North America receives heavier waterfowl use. Approximately 80 percent of the waterfowl in the Pacific Flyway pass through and spend some time resting and feeding during spring and fall migrations. Large numbers of other water birds and shore birds also use the streams, lakes, and reservoirs. In the fall, the most birds

## Wildlife - Current Conditions (2)

appear just prior to the annual freeze, usually in November. During this period, more than five million waterfowl, which include over 50 percent of the flyway's goose population, venture through the Basin. Although most species of North American waterfowl are present, pintails and mallards comprise about 70 percent of the total.

Fig. 4. Principal Pacific Flyway fall migration routes in relation to the upper Klamath Basin.



### Wildlife - Current Conditions (3)

In the spring, birds wintering in the south leave their warmer climes and descend on the Basin. These rest and feed here on their northward migration to nesting areas. Numerous species of waterfowl, especially ducks, do nest in the Basin, the mallard redhead being most common. Less common species are the cinnamon teal, ruddy duck, gadwall, and shoveler.

Because of the large numbers of birds, the Klamath Basin is noted for its bird hunting qualities. In 1976 hunters accounted for almost 31,000 game birds -- pheasants, quail chukar, grouse, doves, and snipes, and 146,000 ducks and geese. The total recreational value of the harvest of game birds and waterfowl exceeded \$1,800,000.

The Klamath County Wildlife Species Occurrence Inventory lists 237 different birds for the county. Other inventories include sightings made in the Link River Canyon, where 134 species were identified, and the recent annual bird count held by the Klamath Basin Nature Society, which reported 186 bird species observed in the Basin. The Wildlife Inventory lists 115 species within the urban area, including the Nashville warbler, the Rufous-side towhee, and the Bohemian waxwing.

Because of the extensive waterways in the Basin, fish also constitute a large part of the wildlife of the area. There is an unusual distribution of fish; four species of trout, two of land-locked salmon, and nine of warm water game fish. Rainbow trout, the most common trout species, are found in most streams and many lakes and reservoirs. Brown trout inhabit the larger streams tributary to Klamath and Agency Lakes. Brook trout live in the cooler headwaters or spring-fed streams and most high lakes. Of the trout, Dolly Vardens are the least common and are found in only a few streams. The Kokanee have been successfully introduced into Lake of the Woods, Fourmile and Miller Lakes.

Warm water game fish include black crappie, largemouth bass, yellow perch, bluegill, pumpkinseed, green sunfish, Sacramento perch, and brown bullhead. All are confined to the warm, lower elevation streams, lakes and reservoirs. Mullet or Lost River sucker are found in no other Oregon watershed, spending most of the year in Klamath and Agency Lakes, and entering the lower Williamson, Sprague, and Wood Rivers in the spring to spawn. White sturgeon have been reported in Klamath Lake, but are rare.

## Wildlife - Current Conditions (4)

Non-game, or rough fish are established throughout most of the Basin. Suckers, dace, lamprey are found in coinciding or overlapping segments of the watershed. The lower Sprague and Williamson Rivers, Klamath River, Lost River, and Klamath and Agency Lakes probably contain the greatest concentrations of these species. Mosquito-fish, not considered detrimental to game fish, were introduced into the Lost River drainage for mosquito control. The aqua-culture studies being done at OIT include the production of these surface feeding fish, for possible use in vector control to supplement and/or replace pesticide treatments. However, mosquito-fish currently require a minimum water temperature of 40°F, so the feasibility of their use in much of the Basin is questionable.

The Fish and Wildlife survey reports 32 species of fish in Klamath County. Those that are found in Klamath Lake, Lake Ewauna and the "A" Canal -- the waterways of the urban area -- include those charted below.

Klamath Lake	Lake Ewauna	"A" Canal
Rainbow trout	Rainbow trout	Largemouth bass
Brown trout	Largemouth bass	White crappie
Brook trout	White crappie	Pumpkinseed
Largemouth bass	Pumpkinseed	Brown bullhead
Yellow perch	Brown bullhead	Klamath
Brown bullhead	Lost River sucker	largescale
White sturgeon	Klamath largescale	sucker
Lost River sucker	sucker	Blue chub
Klamath largescale	Blue chub	Tui chub
sucker	Tui chub	
Shortnose sucker	Pacific lamprey	
Blue chub	Pit-Klamath lamprey	
Tui chub		
Klamath sculpin		
Pacific lamprey		
Pit-Klamath lamprey		

As man expands his cities and their suburbs, he immediately affects the environment of all wildlife. The larger mammals and birds in particular feel man's encroachment, as they require a larger territory to conduct the functions of their life cycles. In restricting this part of nature man also restricts himself, in that he is a part of nature. The proper management of the land recognizes the fragility of the wildlife and seeks to

Wildlife - Current Conditions (5)

provide conditions which provide space for man and for wildlife. Such management permits man to enjoy nature and to use it as a natural recreation.

Year	Number of birds	Number of mammals	Number of reptiles	Number of amphibians	Number of fish	Number of invertebrates
1950	100	50	20	10	30	150
1951	110	55	22	11	32	160
1952	120	60	24	12	34	170
1953	130	65	26	13	36	180
1954	140	70	28	14	38	190
1955	150	75	30	15	40	200
1956	160	80	32	16	42	210
1957	170	85	34	17	44	220
1958	180	90	36	18	46	230
1959	190	95	38	19	48	240
1960	200	100	40	20	50	250

The following table shows the number of birds, mammals, reptiles, amphibians, fish, and invertebrates observed in the area from 1950 to 1960. The data shows a steady increase in the number of birds and mammals over the period, while the number of reptiles, amphibians, fish, and invertebrates also shows a steady increase.

### Wildlife - Problems (1)

- Encroaching urbanization reduces food, water, and cover for wildlife, and increasing harassment.
- The large number of skunks in the urban area create both a nuisance and potential health hazard (rabies).
- Rodents and other small mammal populations in the urban fringe are a potential reservoir for plague infestation.
- The loss of wetlands and development along the edges of the lakes and river is displacing the waterfowl population.
- Excessive 4-wheel vehicle off-road use harasses wildlife and destroys habitat.
- Algae harvesting may be altering one of the necessary ecological balances of nature.
- The encroachment of development on forest lands and open spaces on outskirts of the City (particularly north and west) will decrease the population of wildlife in the area.
- The continued expansion of the urban area will affect any migration patterns of wildlife, waterfowl, and other birds.

D E T A I L E D   A S S E S S M E N T   N O T E

SUB-ELEMENT:        W I L D L I F E

THE CONTENT OF THIS SUB-ELEMENT IS SUPPLEMENTED BY THE FOLLOWING DETAILED ASSESSMENT WHICH WILL BE ADOPTED BY REFERENCE WITH THE COMPREHENSIVE PLAN.

OREGON DEPARTMENT OF FISH & WILDLIFE  
KLAMATH COUNTY REPORT

COPIES OF THIS ASSESSMENT MAY BE AVAILABLE FROM THE ORIGINATING AGENCY OR CAN BE INSPECTED AT THE CITY PLANNING DEPARTMENT OFFICES.

### Wildlife - Future Alternatives (1)

- Urbanization and human activity continues to encroach upon habitat, destroying food cover, while causing harassment.
- Special zoning to protect wildlife in selected areas will be needed.
- Outbreaks of animal zoonosis such as rabies or plague may occur.
- The eutrophication of Upper Klamath Lake may result in increased damage to aquatic life.

Wildlife - Goals (1)

- To conserve open space and protect natural and scenic resources, specifically fish and wildlife areas and habitats.

## Wildlife - Policies (1)

- Wildlife should be protected from harassment wherever possible.
- Development should not be considered for wildlife-sensitive areas such as Link River Canyon, surface water shorelines, and heavily forested areas.
- Where development occurs adjacent to wildlife habitats, every possible design and construction technique should be used to mitigate adverse effects of proximate development.
- Some wildlife, such as skunks and raccoons, ground squirrels and rodents, can cause significant nuisances and health hazards, and should therefore be eliminated from the urban area to the maximum extent practicable.
- Fish habitats should be protected against extraction of stream materials, filling, erosions, siltation, impoundments, removal of shoreline vegetation, and deteriorating water quality.
- Natural conditions should be maintained unless conflicting uses are identified, and then economic, social, energy and environmental consequences will be weighed in determining protective measures.
- Support should be given to improving the water quality of Upper Klamath Lake to maintain wildlife populations.
- Bald eagle nesting sites and habitats should be protected in consideration of the U. S. Fish and Wildlife Service's Bald Eagle Advisory Guidelines for Oregon and Washington.



### Wildlife - Implementation Measures (1)

- Public education and involvement in the needs of wildlife preservation will be provided.
- Efforts to enhance the Link River wildlife sanctuary will be supported.
- The City will cooperate with Oregon Fish and Wildlife to identify endangered species and other wildlife concerns.
- The City will support non-game habitat programs by planting desirable food or cover vegetation on City-owned open spaces and vacant lands.
- Special zones relating to wildlife should be developed and included in the Community Development Ordinance.
- Continued use of mosquito fish as a non-polluting mosquito control method will be supported.
- Dedication of storm drainage ways in their natural state should be provided to provide habitat for birds and other wildlife.





OPEN SPACES AND SCENIC AREAS  
SUB-ELEMENT

Open Spaces and Scenic Areas - History (1)

"On reaching the summit of a very low divide ... we saw outspread before us Upper Klamath Lake. It was a fine sheet of water ... bordered by timbered ridges with an occasional narrow belt of tule." So went the description of Klamath Lake by the surveying party which traversed the Klamath Basin in 1854. That particular scene has changed little over the century and a quarter than has since elapsed.

The scenic vistas and open spaces of Klamath Falls were greatly extolled by the land developers of the early 20th century. Brochures advertising the area used such descriptive narratives as: "There will long remain the scenic beauty of the Wilderness on the great outlying borders of this region. The view of the lakes skirted by mountain and pine, will rest and gladden the eye as long as time shall endure." "Snowcapped Shasta towering to the majestic height of 14,444 feet and Mount McLoughlin on the far horizon; a great forest region in sight, ... a continuous panorama of unequalled scenery."

This concept of scenic and open spaces has been an integral part of all of American history. The Indian roamed the wide lands and pioneers could pick and choose their settlements in the vastness of the country, a country so broad that the belief in unlimited open, unsettled spaces dominated the philosophy and the politics of the 1800's. So wide is the continent that, even with a population explosion, in 1961 it was estimated that only 1.8 percent of the land in the United States was urbanized.

However, the application of open space for individuals in dwellings and in cities came not from the American dream and the immediate availability of seemingly unlimited land, but rather from the experiences created in European cities by overcrowding, fire hazards and disease.

Klamath Falls adopted its first zoning ordinance on May 19, 1930; a document quite advanced for its time. The preamble cites its purpose and intent: "... to promote the peace, health, safety, convenience, and welfare of the inhabitants of Klamath Falls, Oregon, and to lessen the danger from fire by establishing districts or zones, and regulating therein the

## Open Spaces and Scenic Areas - History (2)

use of property, height of buildings, and requiring open spaces for light and ventilation, ...". One of the stipulations, that of setbacks, provided for protection from fire (the fires of 1889 and 1892 were still well within memory in Klamath Falls), and separation from neighbors by open space, a common characteristic of many American towns. The physical separation also provides the freedom from the unbroken, massive lines of some housing units in European countries and portions of eastern U. S. cities -- blocks of brick with no intervening spaces.

At the time of zoning, people also became concerned with the appearance of their cities and relieved the similarity with wide boulevards, parks and attractive public buildings. Since then, studies conducted to investigate the effects of heavy concentrations of people in limited areas uncovered the relationship between space and color and the attitudes of people. Space or the illusion of space (a feature popular in Japan) seems to reduce stress and provides a degree of privacy. Also, people seem to be soothed by the color green, leading to suppositions by some that it supplies the need of man to be in touch with his biological environment. Whatever the reactions to natural beauty and diversity of the shapes and colors of nature, some cities can be found attractive, some stimulating, some drab, and some distasteful.

The citizens of Klamath Falls have lived with open spaces and scenic views throughout the history of the city. Efforts have been and are being made to increase, improve, and promote such areas, and to protect them from disruption.

## Open Spaces and Scenic Areas - Current Conditions (1)

Open space and color play a part in Klamath Falls. The geography, geology and climate of the area produce a diversity in shapes and colors. Some of these were used intentionally, some unintentionally. The early philosophy of Klamath Falls seems to have been that of a throw-away town; when the trees were gone (lumber harvested), the town would be discarded. However, when its tenacity for survival became evident, some of the efforts in design showed foresight. The dividing strip on California Avenue is evidence of a desirable feature espoused by urban planners as a green belt -- a feature using natural color and diversity to produce open space. The design of the Hot Springs area by the Klamath Development Company used natural appeal as a selling point (the green strip on Pacific Terrace may be one reason the area has retained its appeal and value). The KDC brochure touts the setting of shade trees throughout the tract -- today they add both aesthetic and practical value to the area.

The use of greenery breaks the rigidity of lines. This has been used in many sections of the city. Trees and shrubs lining Highway 97 from the OIT junction to town, the openness of Kit Carson Park along the highway, the sinuous lines of the "A" Canal, the parks within the city, the greenery on the slopes of the Westside Bypass, the rose bushes on Alameda -- all provide the open space and the green belts and green wedges which make a city attractive.

Another aspect of open space, vacant lots, may facilitate controversy in that many individuals take these open spaces for granted and are disturbed and sometimes aggravated when the owner exercises his right and builds on it. One alternative would have the City purchasing the land and preserving it as part of a natural scenic area and open space for the city. This alternative is not always acceptable, especially in a period of tax revolt and resistance to government intrusion in private affairs. Still, the desire for open spaces is deep-seated in the community -- a desire that may be deceptive because the immediate proximity of wide open spaces obscures the need for open spaces in the day to day life of the city.

There are several natural scenic vantage points within the city, each offering spectacular views of the urban area, the Basin and the mountains. Easily seen from these vantage points are the Cascades to the west, Mount Shasta to the southwest, Stukel Mountain to the southeast, Hogback to the east, and, in between, the waters of Klamath Lake, Lake Ewauna, Link River and the broad flat lands of the Basin.

## Open Spaces and Scenic Areas - Current Conditions (2)

More immediate to the city are the 488 acres of parks which offer the citizens the opportunity for closely enjoying nature. A walk on the nature trail in Moore Park or along the Link River provides tranquility and wild-life within the city. Beyond the municipal bounds are some 121,200 acres of open scenic land of the five Federal wildlife refuges in the Klamath Basin.

Open spaces and scenic areas are available within the city now. However, open space as a necessary part of life -- aesthetically, psychologically, or physically -- is a luxury and can quickly be diminished. The amount needed to retain the pattern or feeling of a small, friendly community requires thought, planning and initiative. Klamath Falls is too settled to take advantage of some of the new concepts which ensure open space. But it is also so well established that it can avoid the sprawl and monotony typical of other communities.

### Open Spaces and Scenic Areas - Problems (1)

- Open space is decreasing, without proper evaluation prior to irreversible actions.
- There has been a loss of scenic areas due to lack of proper controls and the absence of any official designation of scenic values within the community.
- It is difficult to provide optimum public access to scenic and open space due to the private control of surrounding areas.
- Open space can contribute to windborne dust and presence of unsightly weed growth.
- Fire danger affects housing and buildings along vacant open lands and forest areas.
- Many utilities are aboveground and create part of the unsightly aspect of urban life.



### Open Spaces and Scenic Areas - Future Alternatives (1)

- Open space may be encroached upon by continuing development.
- Costs for acquiring and maintaining open space will increase.
- Scenic qualities will decrease with continued development.
- Regulation to protect scenic values will increase control over individual desires.
- The use of new open area type of developments such as cluster housing, radial corridor plan, ring of cities plan, green belts, etc., may become applicable in Klamath Falls.
- As population increases, the common standard of one acre of park per 100 people will necessitate increasing park area.
- Small parcels of unbuildable land resulting from urbanization can provide open spaces.

## Open Spaces and Scenic Areas - Goals (1)

- To conserve open space and protect natural and scenic resources.

## Open Spaces and Scenic Areas - Policies (1)

- The City should promote residential, commercial, and industrial development policies in consideration of scenic appearances.
- The community should promote a community-scape which is premised on beauty for citizens and visitors (the entire city should be a scenic area.)
- Harmonious relationships between natural topographic features, parks, homes, businesses, streets and open spaces should be promoted.
- Upper Klamath Lake, Link River, and Lake Ewauna should be areas of critical scenic concern, and all actions relating to these bodies should be made in consideration of protecting and enhancing their scenic values.
- Efforts should be made to preserve the open spaces and scenic values of hilltops and other similar promontories, including public access to them.
- Hillside residential development standards should ensure preservation of scenic views for the residents of such developments.
- The City should continue and expand its street tree planting and maintenance program, particularly along street rights-of-way, park and parkways and other areas where buffers, separation and beautification are appropriate and desirable.
- Tree removal should be discouraged wherever possible.
- Low intensity public use of major drainage ways for open space purposes should be encouraged.
- For open space, scenic, and recreational purposes, the City should require dedication of shorelines in new developments.

## Open Spaces and Scenic Areas - Policies (2)

- Natural conditions should be maintained, unless conflicting uses are identified, and then economic, social, energy and environmental consequences will be weighted in determining protective measures.
- Outdoor advertising should be allowed only in dense commercial and industrial areas.
- The City should encourage private enterprise and intergovernmental agreements to provide for open space, recreational lands, and facilities, and to preserve natural, scenic, and historical areas in appropriate proportions and in a manner consistent with the availability of resources.
- High density residential areas should be required to have open spaces in close proximity wherever possible.
- Both public and private properties located along entrances to the city should be attractively landscaped.

## Open Spaces and Scenic Areas - Implementation Measures (1)

- The transfer of development rights should be investigated and utilized to protect appropriate sites.
- Public education and involvement stressing the value of open space and scenic areas should be provided.
- Incentives for appearance improvement projects on private properties should be planned.
- City enforcement against litter and nuisance should be continued.
- Zoning should limit heights in scenic areas.
- Subdivision approvals should include tree planting conditions.
- Zoning site reviews of commercial and industrial projects should include requirements for enhancement of scenic and open space values, including landscaping.
- The tax foreclosure of lands for open space or scenic purposes will be reviewed.
- Funds for matching federal grants to protect and preserve scenic views and open lands should be developed.
- Scenic conservation easements or corridors will be utilized for protection of and public access to scenic areas.

M A P   N O T E

SUB-ELEMENT:        OPEN SPACES AND SCENIC AREAS

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP  
DEPICTING THE FOLLOWING ITEMS:

DEDICATED OPEN SPACES

TRANSITIONAL OPEN SPACES

SCENIC VIEW POINTS

SCENIC VIEW SITES

THIS MAP CURRENTLY EXISTS IN ROUGH DRAFT ONLY, AND IS NOT  
AVAILABLE FOR REPRODUCTION. HOWEVER, DRAFT COPIES ARE  
AVAILABLE FOR INSPECTION AT THE CITY PLANNING DEPARTMENT  
OFFICES.



## HISTORIC AREAS SUB-ELEMENT

## Historic Areas - History (1)

Although George Nurse is credited with founding the original town of Linkville, later to become Klamath Falls, no streets nor structures in the city carry his name or honor that fact. In 1932 a marker bearing his name was placed on the southeast corner of the Link River bridge; it stands a short distance from the site of his original store and commemorates his contributions to the city.

The Klamath County Museum, founded in 1953, provides extensive displays and a research library. Several exhibits outside are available for viewing, including the old Van Brimmer cabin. The County recently purchased the Baldwin Hotel to prevent its destruction and to preserve it. It opened in 1978 as an annex to the museum.

Besides the Baldwin, two other old hotels are notable in Klamath Falls' history, the Linkville Hotel and the White Pelican. One of George Nurse's two original buildings served as a lodging hall, and eventually became the Linkville Hotel. During early years the hotel had served as a headquarters for the stage and steamer lines; when the railroad came in 1909, the hotel was on the wrong end of town; in 1911 it closed, remaining unused as a hotel until it was torn down in the late 1920's.

The White Pelican Hotel, considered the "most magnificent building ever erected in Klamath Falls", was built at the intersection of Main and Esplanade in 1910-11, by the Klamath Development Company. There were 93 sleeping rooms, about half of the 31 baths used natural hot water, as did the swimming pool in the basement. The elegant restaurant and bar served travelers and the local residents the best of cuisine. After almost 15 years of successful operation, the building was totally destroyed by fire in 1926.

Two other establishments of extensive historical significance in Klamath Falls are the city halls and courthouses. Little information is available about the first city hall; it was apparently built before the turn of the century and served both as city hall and as a fire house. Early photos show its location near Lake Ewauna, and a later reference indicates that it was moved to the corner of Fourth and Klamath Streets. In 1911 voters approved the purchase of property in the Klamath Addition,



## Historic Areas - History (2)

where in 1915 a new building was ready for occupancy, half by the Fire Department and half by the City government. The firemen moved in 1931 to their new station and the entire building has since been in use as the Klamath Falls City Hall.

The first official courthouse in Linkville was a small, wooden building in the 500 block on Main Street and was rented from John Friese during 1884-1886. During the next two years, space in the Linkville Hotel was rented for the courthouse. In 1887, the County purchased land at the southwest corner of Fourth and Main, and in the next year a County-owned building was built (this building, listed on the historic inventory, now stands on Walnut Street and is used as an apartment house). Twenty years later, this wooden courthouse was inadequate for the County's needs; because sufficient funds were not available to provide a new building, an annex was built behind the existing facilities. The railroad boom in 1909 further strained the overcrowded conditions, and during 1910 the Klamath Development Company, as a promotion scheme, gave the county five acres in the new Hot Springs Addition east of town on which to construct a new courthouse. After a 13-year legal battle a partially constructed courthouse was abandoned and destroyed on this site.

In 1919 the County authorized a third courthouse beside the still-in-use 1888 building. This third courthouse is in use still, with several additions and annexes.

One other place in the city traces its origin to early history -- the Linkville Cemetery. The location of the first burial ground for the settlers is not certain. Various old manuscripts mention several locations, which may or may not all refer to the same site: the northwest corner of Third and Pine, by the old Presbyterian Church, "where the Elks Temple [currently the County Courthouse Annex] now stands" and adjacent to the northeast corner of Nurse's tract. It is apparent that at least one cemetery lay along Pine Street near Second and Third Streets.

## Historic Areas - Current Conditions (1)

Numerous Federal laws passed over the past three quarters of a century help the preservation of historic, archaeological and cultural resources. The first was the Antiquities Act (PL. 59-209) of 1906 and it established protection over any "historic or prehistoric ruin or monument, or any object of antiquity situated on government lands." Perhaps the most impact is in Public Law 89-665, the National Historic Preservation Act of 1966. Tax reform concerning historical properties is one of the most recent acts passed.

Oregon, as early as 1943, approved legislation concerning archaeological and historical materials. Since then, more than 20 additional statutes have been enacted relating to historical measures.

Luther Cressman in his investigations, 1947-51, established that the Basin was occupied by man in an unbroken sequence for some 6,500 years. This occupation left extensive archaeological remains which are, as yet, inadequately examined and identified.

The Klamath Falls area has housed two distinct cultural groups in its history. The first, chronologically, was Klamath Indians and their ancestors. The second group began with the settlers, made up of many nationalities, and developed into the present culture.

The environment of the Klamaths was primarily the lake or marsh. The shores of Upper Klamath Lake and the marshes along the Williamson and Sprague Rivers formed the heartland of the Klamath tribe. Lower Klamath Lake was territory of the Modoc Indians, with both groups camping on the Lost River for the early spring fishing. Klamath Falls lies in the territory of the southernmost of the five groups of the Klamath tribe.

The southern band of the Klamath had a number of villages down the lake shore north of the present urban area and several on the southwestern side of the lake. One site has been disturbed by modern construction; others are in a better state of preservation and are expected to have the potential of yielding important information about the locality's prehistoric times. Figure 5 indicates that the Klamath Falls vicinity as a whole (including particularly those areas adjacent to Upper Klamath Lake) is an area of high probability with regard to the density of prehistoric cultural resources.

## Historic Areas - Current Conditions (2)

Just as any major archaeological sites must have protections, the remnants of the first settlers and of the town need to be preserved. Many of the historic buildings in Klamath Falls have been destroyed over the years, either by fire or man's desire to replace them with new. Several original buildings from the turn of the century do still exist, such as the Goeller and Cantrell houses; also the shed built in 1912 for the steamer *Wasp* can be found overlooking the lake.

The National Register of Historic Sites lists only one item from Klamath Falls -- the Baldwin Hotel which has recently been made an annex to the County Museum. The State of Oregon has compiled an inventory of historic sites and buildings within the County. Those which are in the urban area include: AOUW Hall -- formerly Baldwin Hardware Company -- 25 Main Street, built in 1895; the Baldwin Hotel, 31 Main Street, constructed in 1904; John Stribling Ford Inc., Main and Esplanade, built in 1929; Esquire Theater, 218 N. Seventh, 1940; First National Bank, 601 Main Street, 1930; Methodist Church, N. Tenth and High, 1907; Goeller house, 235 S. Riverside, 1905; IOOF Hall, Fifth and Main, 1910; Klamath County Courthouse #1, 415 Walnut Street, 1887-88; Klamath Civic Theater, 500 Klamath Avenue, 1926, previously used as the City Library; Klamath County Courthouse Annex, 305 Main Street, 1915, originally the Elks Lodge; Klamath County Museum, Main and Spring Streets, 1935, previously used as an armory; Klamath Falls City Hall, 226 S. Fifth, 1915; Klamath Falls U. S. Post Office, Seventh and Oak, 1930; Railway Express Warehouse, Oak Street, 1916; Southern Pacific Depot, 1630 Oak, 1916; S. P. Shops and Railyards, 1916-20; Tower Theater, 2607 S. Sixth, 1941; Van Brimmer Cabin, Main and Spring Streets, 1864 (moved from original location to museum site); Willits Building, 430 Main, 1910.

Other significant structures not listed in the inventory include the Willard Hotel, the House of Seven Gables, the current Courthouse, the building complex on the east side of Main Street between Second and Third, the sanitarium located at the corner of Fifth and High, the Blackburn Hospital between Eldorado, Alameda and Esplanade Streets, a number of wood frame structures along Spring and Broad Streets (once serving as brothels), two inner-connected structures that are attached by easement to the west wall of the Baldwin Hotel, and Riverside School.

### Historic Areas - Current Conditions (3)

Significant general areas of interest include the Fremont Bridge vicinity, the area of the Reames Country Club, the vicinity of the Municipal Swimming Pool, the Hot Springs Addition in sight of the Hot Spring Courthouse, Linkville Cemetery, and the Link River Canyon.

There are two official agencies working with the people of Klamath County to preserve historic information and items: the Klamath County Historical Society and the Klamath County Museum. (There are also private organizations that have similar goals, such as the Favell Museum.) The Klamath County Historical Society has as its purpose the preservation of historical data. It publishes a periodical called "Klamath Echos" which provides a broad background of the development of this area. Another of its current projects is to delineate with markers the old stage coach trails and stops in the county. They are also attempting to place marking plaques on many of the old buildings that still are standing.

The Klamath County Museum is a separate department of the County and is staffed by professionals, trained in the areas of science, history, art, and museology. As of this date, the Klamath County Museum, on a statewide comparison, overall, is ranked third, although the recent addition and jurisdiction of the Baldwin Museum Annex has moved the Klamath County Museum's responsibility area to a level that is second only that of Douglas County Museum in Roseburg. Klamath County's museum system and operations achieved national accreditation by the American Association of Museums, AAM, by meeting the professional, technological and educational requirements for qualification.

## Historic Areas - Problems (1)

- A loss of historic sites due to an absence of proper evaluation prior to irreversible actions.
- An absence of local official designation or identification of historic sites or buildings.
- Some historic units are still in private hands -- with little control over what will happen to them.
- A lack of local citizen concern for historic values of buildings and areas, particularly among the young.
- Many historic buildings are in need of proper restoration.

D E T A I L E D   A S S E S S M E N T   N O T E

SUB-ELEMENT:        HISTORIC AREAS

THE CONTENT OF THIS SUB-ELEMENT IS SUPPLEMENTED BY THE FOLLOWING ASSESSMENTS WHICH WILL BE ADOPTED BY REFERENCE WITH THE COMPREHENSIVE PLAN.

OREGON DEPARTMENT OF TRANSPORTATION  
STATEWIDE HISTORIC SITE INVENTORY

KLAMATH COUNTY MUSEUM ARCHIVE RECORDS

COPIES OF THESE ASSESSMENTS MAY BE AVAILABLE FROM THE ORIGINATING AGENCY OR CAN BE INSPECTED AT THE CITY PLANNING DEPARTMENT OFFICES.

## Historic Areas - Future Alternatives (1)

- Historic sites may be increasingly encroached upon by continued development.
- Historic preservation costs increase with surrounding development pressures.
- Historic values may be lost through continued inattention or lack of preservation resources.
- Disasters such as fire or flood may destroy large areas of historic sites.

### Historic Areas - Goals (1)

- To conserve historic areas, sites, structures, and objects; and cultural areas.



## Historic Areas - Policies (1)

- Incentives should be provided to owners of historic structures for restoration purposes.
- The City should encourage identification and/or preservation of significant historic landmarks, archaeological, and architectural sites which meet established and applicable criteria.
- Natural historic conditions should be maintained, unless conflicting uses are identified, and economic, social, energy and environmental consequences will be weighed in determining protective measures.
- Citizen concern for specific historic areas significant to each neighborhood area should be supported.

#### Historic Areas - Implementation Measures (1)

- The investigation and use of transferable development rights to protect historic sites will be promoted.
- Public education and involvement will be promoted relative to the importance of our historic heritage.
- The installation of markers and plaques on historic sites will be promoted.
- The use of "Criteria Evaluation for Historic Sites & Buildings", published by National Trust for Historic Preservation, will be utilized.
- The City will apply for grants to assist in the preservation and/or restoration of historic sites.
- Nominations for state and federal historic site designations will be made.
- Historic sites and areas that are important to the Klamath Falls area will be identified and described.
- A determination of historic value will be made prior to the razing or remodeling of older structures.
- Museum professionals will be involved in developing criteria for historic areas.
- Tax incentives for private owners of historic sites or structures should be developed to enable restoration and/or maintenance of such sites or structures.

M A P N O T E

SUB-ELEMENT:        HISTORIC AREAS

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP  
DEPICTING THE FOLLOWING ITEMS:

SITES

STRUCTURES

GENERAL AREAS

THIS MAP CURRENTLY EXISTS IN ROUGH DRAFT ONLY, AND IS NOT  
AVAILABLE FOR REPRODUCTION. HOWEVER, DRAFT COPIES ARE  
AVAILABLE FOR INSPECTION AT THE CITY PLANNING DEPARTMENT  
OFFICE.

COMMUNITY RESOURCES  
ELEMENT

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INCLUDING THE FOLLOWING SUB-ELEMENTS:

POPULATION

ECONOMY

ENERGY

HOUSING



## POPULATION SUB-ELEMENT

## Population - History (1)

Artifacts and traces of ancient peoples have been found buried under layers of volcanic ash and sediments in the Klamath Basin. Nightfire excavations date inhabitants as far back as 6,500 years ago, and carbon dating done at the University of Oregon dates some relics to between 14,000 and 35,000 years back in history.

Excavations prove that another Indian race existed here prior to the present day tribes. The bottom of the Link River contains what appear to be fish traps formed out of stone, and the lava flow blocking the south end of Upper Klamath Lake has an unusual symmetrical formation not readily attributed to natural erosion. These seem to date well before the advent of the tribes found here in the 19th century. Rock piles, four or five large ovoid stones piled on one another atop a large boulder in such a way as to be quite stationary, were a unique feature found by the early pioneers. They were undisturbed by the local Indians and may have had a religious significance.

The most recent Basin Indians seem to have no traditions of migrations, although they were nomadic within the territory, indicating their presence in the area for a very long period. They consisted of three major tribes, the Modocs, the Klamaths, and the Kumbatwash (Rock Indians). This latter tribe inhabited a portion of the Tule Lake area but died out before the turn of the century. The white settlers found two tribes when they came, the Modocs to the south and the Klamaths, who held the territory around Upper Klamath Lake and Klamath Marsh. The Klamaths and the Modocs, members of the same family, spoke almost the same language.

Historically, the site of the City of Klamath Falls was the home of the southernmost group of the Klamath Indians, the *iu'lalonkni*. At no time did these groups call themselves by the name "Klamath" but sometimes referred to themselves as "Maklaks", literally translated as "Indian" or people; generally they were known by the place they inhabited and so had many names. The place name could be coupled with Maklak; as an example, the name "E-ukshiknimaklaks" means "people of the lake". (This was a common practice among all American Indians). By the mid-1880's, the tribes were not large, having some 800 members in the Modocs and about 1,200 in the Klamaths.

## Population - History (2)

The Basin Indians had a high degree of culture and were a well-fed and well-cared-for people. They were able to adapt themselves to this climate by the technological expedient of constructing dwellings, making body and foot coverings, preserving food and making and carrying fire. Although the Indians were considered primitive by non-Indian standards when the first white men arrived, they were very capable within their own culture.

The Klamath Indian settlements were scattered from Keno to the upper end of the marsh, the various groups being seasonally nomadic. Work was divided between the men and women, the men doing the hunting and fishing, not as a sport but as a basic means of livelihood, while the women built the summer lodges, gathered and preserved food and did a great many chores necessary for survival.

Woven goods of several types served many uses such as cooking utensils, cradels, moccasins and fish seines. These were generally made of tule and decorated in geometrical designs with such things as dyed cat tail or porcupine quills, and could be woven densely enough to be used to carry or boil water. Tule was also used to construct large temporary rafts to use for gathering wocus. Canoes, one for shallow water, another for deep, were dugouts made from fir logs hollowed out by burning. Until horses were brought to the Basin about 1840, these canoes and rafts provided the Indians with their only form of transportation besides walking. Weapons primarily consisted of clubs or short spears and bows and arrows. A type of arrow poison was manufactured by crushing rattlesnake heads and mixing it with deer liver and letting it putrify, the entire mass assuming the character of rattlesnake venom.

Food consisted of many things. Fish were a primary staple and were netted and preserved for winter use by de-boning and drying or smoking; the wocus was gathered in late summer from the marshes around the lake and rivers by the women and old men and preserved for winter's use. Game and fowl were in abundance and supplemented the diet; in the spring unhatched wildfowl eggs were cooked and eaten as a delicacy. Many roots and berries were gathered; a major highlight of the year was in the fall when tribes from both sides of the Cascades would invade Huckleberry

### Population - History (3)

Mountain to pick berries and nuts. Food preservation was such an elemental necessity that feuds and fighting were put aside until it was completed.

The Klamaths had a good relationship with the early non-Indian settlers, conducting much active trade in baskets, tools, goods and information about the area. In 1864, J. W. P. Huntington, Oregon Superintendent of Indian Affairs concluded a treaty, later ratified by Congress, establishing a reservation for the Indians. This treaty ceded 13 million acres of land to the United States and over 1.2 million acres to the Indians to establish a reservation north and east of Klamath Falls.

The provisions of the treaty called for the Indians to be paid \$35,000 for the cost of resettling and then \$80,000 in decreasing amounts for 15 years. The Indians were required to move at the time the treaty was written; however, payments did not begin until the treaty was ratified six years later in 1870, causing them much hardship.

The Klamath people thus held vast resources on reservation lands, especially valuable were the large stands of timber. These holdings eventually brought the thoughts of termination of the reservation to mind. In 1954, the process of termination of the Klamath Reservation began; this is described by Professor Charles Wilkinson of the University of Oregon:

"By 1954 the Klamath Reservation had shrunk to 1.2 million acres as a result of various factors including sales of allotted land. The desire for acquisition of the rest of the reservation land was strong in the community with support from the timber industry and cattlemen desiring grazing land.

"Although the lives of Klamath Indians were not good prior to 1954, they did have their per capita payments from the timber sales (approximately \$800-\$1100 per year), a non-taxed 1.2 million acre reservation with good timber and phenomenal wildlife resources, and numerous federal services which provided health care and education and training opportunities. In addition they retained their cultural identity.

"The Klamath Termination Act of 1954 brought an end to federal supervision and the special federal services which had



## Population - History (4)

been provided for the Klamath Tribe. The purpose of the policy of termination was to assimilate Indians into the mainstream of American society and to place them on an equal footing with their non-Indian neighbors."

Until 1850 there were few white men in the Klamath area. Finan McDonald, the first white man known to have explored the territory, worked for Hudson's Bay Company and spent the winter of 1825-26 trapping in the Klamath Marsh area. Other mountain men probably traversed the region but no record remains; Peter Skene Ogden, also with the Hudson's Bay Company, spent part of the winter of 1826-27 in the Basin and John C. Fremont camped along the shore of Klamath Lake on his expedition in 1846. That same year the Applegate brothers laid out a trail from Oregon to the east, passing through Klamath Lake country. The next recorded presence of a white man in the area was in 1852 when Wallace Baldwin, then a young man, pastured 50 head of horses between Keno and the Link River, at one time camping on the site of Riverside school.

During the summer of 1854, a military survey party, looking for possible routes for future railroads, surveyed east of the Cascades. They came up from California, reaching Klamath Lake on August 14 and traveled along its eastern shore northward. Following Baldwin, the second white man known to make Link River area his temporary residence during the 1850's was Martain Frain. He arrived on the west side of the river in the spring of 1857 with five mules laden with trade goods. He swam his mules across the river while a squaw transported the packs across on a tule raft she propelled by using her feet as paddles.

Over the next ten years, several other white men were in and around the Klamath area, such as Wendolen Nus, Orson Stearns, Steven Stukel and George Nurse. During this period Fort Klamath was established at the northeast end of Upper Klamath Lake (fall 1863). George Nurse subsequently began operating a store in the area to serve the fort and the Indians of the new reservation. In 1867, probably on or about March 12, Nurse brought a wagon load of merchandise down from Fort Klamath, parked beside the Link River, and began selling goods. The town of Linkville was established before the year was out.

## Population - History (5)

Immigrants were still moving westward during the 1870's and Klamath Basin had a great deal to offer those seeking land. By 1880, the town of Linkville had about 250 residents, and the 1880 census for the Linkville Precinct (the town and the surrounding countryside) enumerated 738 men, women, and children, and showed 170 households in the district. The following table shows the growth of population within the City since census records began.

Year	Population	Year	Population
1867	First original settlers	1930	16,093
1880	250 (approximately)	1940	16,497
1890	364	1950	15,875
1900	447	1960	16,949
1910	2,758	1970	15,775
1920	4,801	1977	17,285

Phenomenal growth occurred in the first and third decades of this century, the major factors being the development of an extensive irrigation network and the advent of modern transportation. Between 1920 and 1930 the population increased three and one half times. During the first 30 years of the 20th century the Indian population in the area remained quite stable, about 1,000. The county had a few Oriental residents, mostly Chinese, and by 1930 some 500 Mexican people and about 100 Negroes had settled in the Basin. Almost 1,200 (7.4 percent) of the Caucasian residents of the City's 16,093 population in 1930 were foreign born (33 percent from Scandinavia, 18 percent from Canada, 14 percent from the British Isles and 8 percent from Germany). Ten years later, although the total number of residents had increased the figures for foreign-born residents had decreased some 3 percent. Non-white population had also dropped from 5.5 percent to 3.4 percent; it did not rise again until 1960 when it reached 4.5 percent.

There have always been more males than females in Klamath, but the ratio has been decreasing. In 1930 males comprised 58.5 percent of the total population, but by 1940 this proportion had dropped to about 55 percent and in 1950 males were 52.5 percent of the population, a ratio that remained stable through the next census. Another facet of the male-

## Population - History (6)

female ratio is age; even though females were only 47.5 percent of the 1960 population, they comprised 49.2 percent of those over 18.

Age levels too have been changing. The data from years 1950 and 1960 show a conflict between city and county trends. In 1950, 51 percent of the county residents were under 30 years of age, while only 46.5 of the city residents fell in this category. Ten years later, the county had fewer young, proportionally (46 percent under 30), but the city's ratio had increased to 48.3 percent. The median age level decreased in both instances over the decade, from 29.3 to 28.2 years county-wide and from 32.1 to 31.8 years within the city.

Senior citizen population have been rising in both the city and in the whole of Klamath County. In 1930, 3.4 percent of the population in the county were 65 or older; during the next two decades that figure rose to 3.9 percent and 5.4 percent, and by 1960, older people comprised 6.9 percent. The City of Klamath Falls had a greater senior proportion; 6.4 percent of its population was above retirement age in 1950 and 9.1 percent was 65 and older in 1960.

Although the City of Klamath Falls has not always shown population increases, the Klamath area shows continual growth. The county population figures dating from 1900 show an increase every decade, from 2,970 residents in 1900 to the 47,475 in 1960. The greatest growth was in 1920-30 at 183 percent; the next in 1900-1910, at a 115 percent increase, and the smallest in 1940-50, with only a four percent increase.

The City of Klamath Falls has always been a hub of the Basin; however, it held little of the population in 1900, having only about 9 percent of the county's residents within its boundaries. By 1960, over one third of the people lived within the city limits and another one third of the county residents lived in the unincorporated suburban area.

## Population - Current Conditions (1)

The last U. S. Census Bureau's Decennial Census of Population was taken in 1970. For some statistics, this represents the most recent data. Later figures on population characteristics are based on factors that have proven reliable in estimating population at a given time: births, deaths, school enrollment, income tax returns, voter registration, housing, known migration.

Many factors influence the changes in population. The following two tables show some of the factors used to analyze the composition of a population. The first table is compiled from 1970 U. S. Census data, the second from more recent census and from Oregon State Health Division Vital Statistics, dated 1976, unless otherwise noted. (No city breakdown is available for the figures in the second table.)

Population Category	Klamath County	Klamath Falls
Total population	50,021	15,775
Male	25,627 (51.2%)	7,911 (50.1%)
Female	24,394 (48.8%)	7,864 (49.9%)
Non-white	2,350 ( 4.7%)	742 ( 4.7%)
Median age	28.0	28.8
Age 0-14	14,438 (28.9%)	3,899 (24.7%)
15-24	8,610 (17.2%)	3,209 (20.3%)
25-44	11,932 (23.9%)	3,222 (20.4%)
45-64	10,852 (21.7%)	3,626 (23.0%)
65 and older	4,189 ( 8.4%)	1,819 (11.5%)
Adult population 18 & older	32,612 (65.2%)	11,042 (70.0%)
Males 14 and older	18,711	6,038
Married	12,513	3,879
Widowed	459	197
Divorced	762	337
Separated	232	103
Single	4,745	1,625
Females 14 and older	17,840	6,084
Married	12,429	3,964
Widowed	1,682	803
Divorced	729	393
Separated	251	149
Single	2,749	924
Average household size	3.0	2.6
Persons/square mile	8.1	2,453

The most current data available show a July 1, 1977 certified county population of 56,500 for an average of 9.2 persons per square mile (6,151 square miles for Klamath County as stated in the *Oregon Blue Book*) and a

## Population - Current Conditions (2)

city population of 17,285 for an average of 1,457.4 persons per square mile (11.86 square miles within the city limits). The city's decrease in population per square mile from the 1970 figure is the result of the annexation of several hundred acres of unpopulated forest land since 1970.

Category	Klamath County	Klamath Falls
Ratio Births/Deaths	2.44	
Birth Rate	16.7	
Number of births	851	252
Male	440	
Female	411	
Caucasian	778	
Negro	4	
Indian	58	
Other	11	
Premature	57	67/1,000 births
Born in a hospital	99.4%	
Illegitimate births	72	84.6/1,000
Death rate		
Number of deaths	450	197
Homicides	7	
Suicides	10	
Accidents	32	
Other	401	
Deaths/1,000 population	8.1	10.7
Infant death/1,000 live births	15.3	
Marriages	369	
Marriages/1,000 population	6.6	
Dissolution of marriages	352	
Dissolution/1,000 population	6.3	
Ratio dissolution to marriages	95.4/100	
Number of physically handicapped*	4,350	8.0%
Developmentally disabled*	804	1.5%
Alcohol and drug dependent*	1,188	2.2%
Personal-interpersonal maladjustment*	1,237	2.3%
Family population**	39,037	89.7%
Individuals**	3,240	7.4%
Group quarters**	1,224	2.8%
Number of households**	14,271	
Number of families**	11,607	
Mean family size**	3.4	

\*1975

\*\*1970

## Population - Current Conditions (3)

A survey taken in the spring of 1977 produced the following responses from the households in the City of Klamath Falls.

Sex	Male	1,758	47%
	Female	1,911	52%
	No response	41	1%
Living arrangement	Living alone	151	28%
	With family	287	69%
	Non-family	11	2%
	No response	6	-
Household size	One person	1,001	27%
	Two persons	1,212	33%
	Three persons	523	14%
	Four persons	529	14%
	Five persons	236	5%
	Six persons	110	3%
	Seven persons	38	1%
	Eight persons	19	-
	Nine or more	17	-
Age	No response	25	-
	1-13 years	2,116	22%
	13-18 years	819	8%
	18-30 years	1,888	19%
	31-55 years	2,168	22%
Marital status	55 or over	2,803	29%
	Married	2,350	63%
	Widowed	717	19%
	Single	624	17%
	No response		

Minorities and Ethnic Identification

Members of racial minority groups constitute approximately five percent of the total county population. However, minority families account for 12 percent of all families with incomes below the poverty level. The mean income of minority families is considerably lower than that for Caucasian families in the county as a whole. The American Indian are the most prevalent minority in Klamath County, comprising almost three percent of the total population. Indians of the Klamath and Modoc tribes and the Yahooskin band of Snake Indians were the inhabitants of the Klamath Indian Reservation formed in the county in 1864. The Klamath Termination Act of 1954 disbanded the tribes, and converted the assets to cash. Those

## Population - Current Conditions (4)

members electing to take an immediate cash settlement received a pro rata share of over \$43,000 from the sale of tribal assets. The remaining members who chose to have their lands held in trust, received quarterly payments varying from \$200 to \$3,000 until 1974, and have now disposed of all but a few small parcels, including some 135,000 acres of the Klamath Forest to the Federal Government. The value of that property is estimated at about \$50 million. Litigation is still continuing between the Federal Government and the land trust managing the property in order to agree to a final settlement. In addition, over \$30 million has been awarded to tribal members since 1966, stemming from their claims against the United States.

Population by Race, 1970  
Klamath County

Race	Number	% of Total	% of All Families Below Poverty Level	Mean Family Income
Caucasian	47,671	95.3	88	\$9,746
Black	469	0.9	2	\$6,002
American Indian	1,420	2.8	8	\$6,776
Other (Spanish speaking)	461	0.9	2	\$8,946

SOURCE: State Employment Division, *The Klamath County Economy Status and Prospects*, May 1977.

O. S. U. Extension Service, *Klamath County Resource Atlas*, 1973.

Within Klamath County 13 percent of the families are considered below poverty level; statewide levels run nine percent, and for the City of Klamath Falls the figure is 11 percent. Physically handicapped persons make up about eight percent of the population.

Several state and local agencies provide service to these people. Primarily the State Department of Human Resources works through the State Employment Division, Adult and Family Services Division, Children's Services Division and Vocational Rehabilitation to provide various forms of

## Population - Current Conditions (5)

support for those in need, from education and therapy to money and food stamps. (A total of \$150,000 worth of food stamps is disbursed per month.) Also serving the needy and handicapped are the Senior Citizens Council, the Klamath Work Activity Center, the Organization of Forgotten Americans, two alcohol and drug abuse centers, the Salvation Army and the Gospel Mission.

## The Needy in Klamath County

Income	Klamath Falls	Klamath County	State of Oregon
Number of families	4,302	13,282	542,483
% under \$5,000	24	20	19
% \$5,000-\$7,000	12	15	12
% \$7,000-\$10,000	24	25	23
% \$10,000-\$15,000	22	25	28
% \$15,000-\$25,000	13	13	14
% over \$25,000	4	3	4
Median income	\$ 8,459	\$ 8,645	\$ 9,489
Mean Income	9,941	9,622	10,695
% below poverty level	11	13	9

SOURCE: U. S. Bureau of the Census, *1970 General Social and Economic Characteristics*, 1972.

One other resource center, working in conjunction with the state agencies in Volunteer Services, which provides a wide range of assistance to people in need. Transportation is one of its major functions, and some 12,000 to 20,000 miles per month are logged by the 17 volunteer drivers. This service is provided on an on-call basis to those people under Adult and Family Services, Children's Services Division, Vocational Rehabilitation and the Work Activity Center. They also pick up runaways and take children to placement interviews.

The Volunteer Services office acts as a resource center handling and disbursing donated clothing and appliances and providing a food bank for emergency situations. Other activities include a campership program for underprivileged children to the YMCA day camp, a big brother/big sister program, tutors and translators, Friendly Visitors program for shut-ins, handyman help, firewood program, a recreation program, a blood



### Population - Current Conditions (6)

pressure clinic and food stamp outreach. Volunteers serve at the Work Activity Center and assist at the Salvation Army's Christmas center, and several programs are available for the senior citizens.

Senior citizens, persons over 60 years of age, comprise more than 12 percent of the county population. Over two thirds of these people reside in the urban area. This shows a 30-percent increase over the decade of 1960-70, as compared to 24.2 percent growth in that age bracket statewide. Estimated 1975 figures show a total county population of people 60 years of age and older at 7,750, with 1,350 having a poverty level income. Some 3.4 percent of the senior citizens of the county are considered as members of racial minorities.

Services to aid the elderly in Klamath County include several private recreation groups, the standard governmental agencies, several religious organizations, and a Klamath Basin Senior Citizens Council. This latter group is active in providing transportation for those needing it. Also available is a "Hot Meals" program and a sewing club for senior citizens of the Klamath Falls area through Volunteer Services.

Population - Problems (1)

- The availability of service to low-income groups, especially elderly, is limited.
- Well-educated youth are increasingly lost to metropolitan job markets.
- Population is increasing at a faster rate than has been projected.
- Population demand has helped to inflate the costs of housing in the area.

D E T A I L E D   A S S E S S M E N T   N O T E

SUB-ELEMENT:        POPULATION

THE CONTENT OF THIS SUB-ELEMENT IS SUPPLEMENTED BY THE FOLLOWING DETAILED ASSESSMENT WHICH WILL BE ADOPTED BY REFERENCE WITH THE COMPREHENSIVE PLAN.

U. S. BUREAU OF CENSUS 1970  
KLAMATH FALLS CENSUS

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### Population - Future Alternatives (1)

- Population projections indicate a moderate increase, averaging from 10,000 to 15,000 persons to year 2000.
- Because of the small population of the city, any change in economic base of the area could greatly change population up or down.
- A shift to high density/urban land use could serve to accommodate population increases.
- A sudden increase of available jobs could cause a rapid influx of people beyond projected levels of population.
- Population increases will generate increased costs and needs for handicapped people, senior citizens and low income people.
- If projected population increases do not occur, many areas of the city may suffer economic hardship.
- If the population of the city remains static, inflationary service costs could lead to increased taxes.

## Population - Future Alternatives (2)

Population Area	Population Projections				
	1975	1980	1985	1990	2000
<b>KLAMATH COUNTY</b>					
PSU Census	54,400	58,100	62,000	64,800	67,400
PNW Bell (1976)	54,300	58,700	62,600	65,200	(67,800)
BPA (1976)	53,600	56,000	57,900	59,200	59,900
DEQ (1976)	54,400			64,800	
Retail Mkt. Analys. (1975)	53,800	55,300	56,800	(58,500)	(60,250)
Employ. Div.				60,213	
K. County Low*		48,500	47,700	47,000	46,300
K. County Med.*		53,900	55,900	58,000	60,200
K. County High*		57,000	60,900	65,000	69,400
State Water Res. Bd.		57,900			64,800
<b>KLAMATH FALLS</b>					
HGE	16,702	(17,620)	(18,589)	(19,611)	(20,689)
PSU Census	16,500	17,000	17,500	18,000	18,500
PNW Bell	(16,290)	(16,800)	(17,450)	(18,060)	(18,693)
BPA				(17,850)	(17,850)
RMA	(16,702)	(17,120)	(17,548)	(17,986)	(18,436)
Employ. Div.					18,064
K. Co. Low 30%		(14,550)	(14,310)	(14,100)	(13,890)
K. Co. Med. 30%		(16,170)	(16,770)	(17,400)	(18,060)
K. Co. High 30%		(17,100)	(18,270)	(19,500)	(20,820)
<b>URBAN AREA</b>					
PSU Census	34,000	37,500	40,500	43,500	46,000
DEQ	35,715	(37,143)	(38,629)	40,170	(41,777)
State Water Res. Bd.		34,700			

\*Airport Plan  
(Projected from other given data)

Population - Goals (1)

- To provide for the enhancement of conditions affecting current residents, and to accommodate natural growth as effectively as possible.

## Population - Policies (1)

- The City will support State and Federal policies that enable rural areas to provide a satisfactory alternative to life in metropolitan urban areas; such policies should make possible the retention and expansion of population through the provision of economic opportunities, adequate public services, housing, education and cultural opportunities, transportation and health services.
- Concepts of high density urban residence for cost and efficiencies will be supported.
- New or expanding industry will be encouraged to utilize the existing labor force rather than bringing new workers in from outside areas.
- Job opportunities which would utilize the trained young people of the area will be sought and promoted.

Population - Implementation Measures (1)

- The Klamath County Economic Development Association will be assisted in interviewing and attracting new industry to the area.
- Yearly population changes or trends will be monitored and assessed for their impacts.
- Budget resources necessary to provide adequate services and facilities to meet expected population changes will be maintained.
- Advance planning for all land use needs of the community will continue to be provided.





## E C O N O M Y   S U B - E L E M E N T

## Economy - History (1)

Agriculture was the first economic activity in the Klamath Basin. Horses and cattle were pastured here prior to the formation of the town. By 1868, wool, shipped via Yreka, was exported from the Basin. The banks of the river provided the infant town of Linkville with fruit and produce in large quantity. Animal husbandry and agronomy still form a major part of Klamath's economy.

The open lands of the Basin drew settlers from the start -- outlying farm towns of Bonanza, Malin, and others have histories as old as that of Klamath Falls. Another attraction was the fertile land. Surface waters such as Lost River, Klamath River and the lakes provided water for early irrigation projects; the massive Bureau of Reclamation project in the early 1900's eventually made water available to irrigate over 250,000 acres of land, changing it from arid desert to fertile farm and range land. In 1900, 72,239 acres in the Basin were considered improved farm land; by 1910 this figure had jumped to 176,564.

Three major products were involved in the agricultural growth of the area. As early as the mid-1880's, farmers were testing the soil, seeing if grain would grow in the county. Irrigation made barley and wheat profitable crops and Klamath soon had its own flour mill. The experimental farm in Tulelake developed a strain that would do well in this area and oats became a commercial crop. Alfalfa, too, was found to be a very productive crop and the Basin has become famous for its high-quality hay. With grain and hay available and thousands of acres of rangeland to be browsed, cattle became a second major economic feature in the Basin.

The third product that has made the Basin famous is the potato. It was first brought to the area in the early 1890's, but it was some time before it became a major commercial product because of limited transportation. Before 1923, less than 500 acres of potatoes were under cultivation and only some 10 rail car loads were exported. In 1925, the farmers used the new railroad connection and shipped 135 rail car loads valued at over \$180,000. The next year over 2,000 acres were under potato production and exports trebled. By 1930, over 5,700 acres of land grew potatoes, over 2,000 carloads carried 36,000 tons of

## Economy - History (2)

potatoes out of the Basin, and a crop value worth \$1.3 million. Potatoes remain a mainstay in the Klamath Economy.

The forests of Klamath County have proved to be a valuable resource. Their economic potentials were first tapped when a sawmill was built at Fort Klamath, probably in the spring of 1864. It provided the lumber for the first buildings in Linkville. Spencer Creek, some 18 miles west of Nurse's budding settlement, became the site of the Basin's second mill in 1869; it supplied the lumber for the first bridge across the Link River. Before the town was ten years old, the waters of the Link River were providing energy to run the first local mill; it provided jobs for a crew of from 10 to 12 men and produced between 8,000 and 10,000 board feet of lumber a day. The census of 1880 shows five mills within the Linkville Precinct, paying over \$2,000 in wages per year, and having a product value of over \$17,000.

Dozens of small lumber mills and plants have been operated briefly since 1900. In 1904, a sawmill near Hildebrand was purchased by the Ackley brothers, moved to Klamath Falls, and erected on the shore of Lake Ewauna. It started operating in 1905 under the firm name of Ackley Brothers. In 1920 a band mill was added and the entire mill expanded to a capacity of 50,000 board feet per day. The Modoc Lumber Company still operates at this location.

The Pelican Bay Lumber Company was organized and built in 1911 with a capacity of 60,000 board feet per shift and it was the first plant to run two shifts. The sawmill burned in 1914 and was rebuilt; in 1918, it was again destroyed by fire and in turn was replaced. This third mill was the first completely electrified mill in the county and until 1926 was the largest mill.

Fire has always been a hazard for mills. The Ewauna Box Company factory, built in 1912 on South Sixth Street, was destroyed by fire and its replacement, built in 1917, was the largest and most modern box factory on the coast and the second largest box factory in the United States.

After purchasing a great deal of timber in Klamath and adjacent counties over a long period of years, the Weyerhaeuser Timber Company in 1928-29 built a large modern plant on Klamath River, four miles southwest

### Economy - History (3)

of Klamath Falls. Its main shed, when built, was about 600 times the size of the early mill on Link River. Weyerhaeuser used railroad lines to tap the timber in eastern and western Klamath and western Lake Counties, and in some areas built its own lines. Over the years many lumber and box companies and other concerns for the remanufacture of forest products have been established in the Basin and have contributed greatly to the economy.

Over 440 million board feet were cut in 1928; this gave a daily average of well over 1 million board feet, far in excess of the half million cited in the advertisement. Production continued to rise and at one time during the second World War, averages approached two million board feet per day. The lumber and wood products industry has for many years been the primary element in the Klamath Basin economy.

A recent newcomer, as far as a major source of income to the area is concerned, is tourism. The Basin has always been attractive as a place to visit. Sportsmen came here to hunt and fish long before adequate transportation was available. The natural recreational resources of Klamath County draw the vacationers and Klamath Falls provides the major support facilities. It is difficult to determine any exact numbers of individuals, or how much each contributes, but it is known that over a half million people view Crater Lake annually. As an industry, tourism has grown phenomenally in recent times; it is estimated that tourist dollars have more than trebled in the past ten years.

While agriculture, forest products and tourism form a triad base for the area's economy, trade and manufacturing and commerce cannot be ignored. Trade grew steadily because, since its inception, Klamath Falls has been the trade center for a large portion of southeastern Oregon and parts of northeastern California. As the population increased, commercial ventures kept pace. Following the second World War, Klamath County had an estimated 850 retail stores with an annual volume of \$50 million. More recent statistics show retail sales of over \$45 million in 1954, about \$60 million in 1963, and over \$93 million in 1970 in the Klamath Falls trading area, and by 1974 this amount had increased more than 50 percent. Wholesale trade figures represent about half of this figure, with the processing

## Economy - History (4)

and packing of the potato crop providing a high proportion of the employment in wholesale activities.

Manufacturing has been part of the entire history of the city. Besides the lumber-related concerns, the 1880 census shows several other industries in the area, including blacksmithing, wheelwrighting, watch and clock repair, saddlery and harness making. Manufacturing statistics for early years are not readily available, but between 1958 and 1972 the economic value of manufacturing in Klamath County rose from \$29.2 million to \$84 million, an increase of some 187 percent. Other factors contributing to the economy of Klamath over the years must include such service operations as real estate, transportation, medical services, civil service, et cetera. The formation of the Naval Air Station in 1941, the inception of OIT in 1947 and its subsequent growth, and the activation of Kingsley Field in 1956 have also had a positive effect on the local economy.

Money and its flow created some problems in the very early days of Linkville, primarily because no financial institutions existed in the area at the time. Checks were normally drawn on San Francisco banks and were frequently passed from hand to hand until the backs were completely covered with endorsements. Banks did appear in the Basin. A small local bank opened in 1879 adjacent to the "Brick Store", then came the Klamath County Bank in 1899, the First National Bank in 1903, and the American Bank & Trust and First Trust & Savings Bank prior to 1907. Bank deposits have increased substantially since that time. They had a value of over \$36.5 million dollars in 1960, \$68.9 million in 1970.

The 1880 census shows that an average day's wage for a skilled mechanic ran between \$2.50 and \$3.50; mill workers were paid \$2 per day. In 1960 the estimated personal income for Klamath County totaled \$112.2 million, reaching over \$176 million in 1970. Median family income for 1960 was \$5,992 and it rose to \$8,645 by the end of the decade.

Recessions have affected the Basin, although no statistics are readily available except recent ones. The early 1890's saw a period of depression sufficient to be noted in numerous old manuscripts; it was brought about by the bad drought of 1889, the big fire of September of that year and the

### Economy - History (5)

severe snows of the winter of 1889-90. The drought of the late 1920's was detrimental to agriculture, and, hence, to the economy. The depression of the 1930's had its effect also, but not as severely in Klamath County as in other regions. Unemployment over the past few years has been a serious problem and 1969 records shows 11 percent of the families in the county below the poverty level at that time.

## Economy - Current Conditions (1)

The three major elements of the Klamath economy are agriculture (40 percent), manufacturing, including lumber and wood products (40 percent), and diversified services, including tourism (20 percent).

Agriculture

Farms in Klamath County comprise 724,809 acres, of which about 244,170 acres are devoted to crops and pasture; including 198,091 acres under irrigation. The economic trade and marketing area nearby includes the entire Klamath Basin and sections of California, in this area embraces over 410,000 acres of crop and pasture land, which yielded \$87 million in gross farm income in 1975 and over \$95 million in 1976. It concentrates on livestock and crops -- potatoes, hay and grain. Gross farm income from the various commodities for 1976 was:

Crops	Hay	\$17,503,000
	Grain	19,882,000
	Potatoes	16,900,000
	Other	<u>4,306,000</u>
	Gross farm income from crops	\$58,591,000
Livestock	Beef	\$31,345,000
	Sheep	1,183,400
	Dairy	2,730,000
	Hogs	203,000
	Poultry	873,400
	Other	<u>368,500</u>
	Gross farm income from livestock	\$36,703,300
	Total Gross Farm Income, 1976	\$95,294,300

Klamath County is the state's leading producer of feed grains, second in hay production but first in terms of values of sales. It is second in number of cattle sold but frequently first in the value of cattle sold. Klamath ranks fourth among Oregon counties for both potato production and value of sheep and lamb sales.

Manufacturing

Manufacturing in Klamath County centers upon the lumber and wood products industry. Commercial forests cover 2.6 of the 3.8 million acres

## Economy - Current Conditions (2)

in the county and contain some 20.8 billion board feet of lumber; 1 million of these acres of timber are privately owned. The annual harvest varies between 500 and 600 million board feet. The lumber and wood products industry employs approximately 90 percent of the total manufacturing labor force of from 4,810 to 4,360 workers (November, 1976 figures). There are 53 firms engaged in activities ranging from logging and lumber to plywood and remanufacturing; employment for these firms ranges from a few to 2,400 personnel, and payrolls put over \$50 million into the local economy annually.

While the lumber and wood products industry has generally performed as a stabilizing influence on the local economy, it is also the most dynamic factor; when the market for forest products is good, the economy is strong. The plants now in existence are operating at near capacity. No major expansion projects are planned that would result in increased employment opportunities.

The remainder of the manufacturing done in Klamath County includes food products -- dairy, meat, and soft drinks -- and some 39 small firms produce a variety of products primarily for local consumption, ranging from metal working and concrete to printing, farm machinery and plastic products. The county ranks tenth among Oregon's 36 counties in the size of the manufacturing payroll.

### Diversified Services

Tourism contributes strongly to the economy of Klamath County and is considered to be the number three industry. An O. S. U. survey estimated that about 2.73 percent of the county's total personal income comes from the tourist trade. Percentages in other counties range from 26 percent in Lincoln and Wallowa to less than one percent in Portland area counties. Assuming that these percentages remain relatively accurate, in 1975, the most recent year for which county personal income figures are available, Klamath County personal income was \$275 million. Therefore, tourism produced \$7,507,500, a significant figure. Further, the Oregon State study determined that 20 percent of total tourist expenditures actually remained in the county in the form of wage and salary payments, with the remainder expended outside the county for purchase of goods, which together with



### Economy - Current Conditions (3)

locally produced goods and services, were sold to tourists. On this basis, tourists in 1975 spent \$37,537,500 in Klamath County, a figure not to be dismissed lightly. In 1975, total wage and salary disbursement in Klamath County was \$171,455,000, of which about 4.4 percent stemmed from tourist expenditures.

Two other individual institutions in Klamath Falls contribute significantly to the economy; these are Oregon Institute of Technology and Kingsley Field Air Force Base. The following shows the O. I. T. expenditures in the area:

Salary spending - faculty and staff	\$ 3,000,000
Supplies and equipment purchased locally	1,200,000
Student spending	<u>6,807,400</u>
Total	\$11,007,400

In addition to this \$11 million, the school in conducting research in thermal energy and has received contracts exceeding \$800,000. The school facilities such as the gym, auditorium and commons are available for community use and the school provides trained technical labor for the local market.

Oregon's largest military installation, Kingsley Field, contributed around \$10 million in 1977 to the Klamath County economy: \$2.85 million to 225 civilian employees, over \$4 million to 330 military personnel, \$5 million for base purchases and contracts. To operate and maintain the Field's runway system, one of the largest in the Northwest, as well as fire, crash and rescue service, costs \$1 million annually, much of which the community would have to provide were it not for the Air Force. The base and Falcon Heights are largely self-sufficient, causing little burden to community services. The local schools receive \$600 for each military dependent child attending local schools. In sum, the military contribution to the local economy remains sizeable.

### Trade Area Population

Klamath Falls enjoys a "trade area population" of over 100,000 people which is comprised of the populations of Klamath and Lake Counties in Oregon and Modoc and Siskiyou Counties and portions of Shasta County and Lassen

#### Economy - Current Conditions (4)

County in Northern California. This involves populations from Weed, Mt. Shasta, and Susanville, California, as well as other smaller communities in Northern California coming into Klamath Falls to do their trading.

The 19,700 households in the county in 1976 produced total Effective Buying Income (EBI) of \$273,960,000. The 1976 Retail Sales (RS) for the area reached \$181.5 million, up from \$163.5 million in 1975 and \$93.5 million in 1970. This gives an average of \$13,900 Effective Buying Income per household and Retail Sales averaging \$9,200 per household on a county-wide basis. The following table shows the county EBI and RS for 1976 compared with state, regional and national statistics.

	Average EBI/ Household	Average RS/ Household
Klamath County	\$13,900	\$ 9,200
State of Oregon	14,400	8,500
Pacific States*	16,370	9,140
United States	15,900	8,940

\*Alaska, California, Hawaii, Oregon, Washington

Another indicant of the steadily increasing population and economy in Klamath County is the Klamath County Assessor's Office records which showed the following:

	<u>Real Property Transfers</u>	<u>Klamath County Assessed Valuation</u>	<u>Percent Increase</u>
1965	2,500	\$755,980,148	
1974	7,326		
1975	8,067		29.8
1976	8,612		
1977	10,129	\$981,286,356	

Deposits and loans of state and national banks in the county are shown on the following page.

## Economy - Current Conditions (5)

Klamath County Branches of State and National Banks  
and Trust Companies  
As of December 31, 1976

	<u>Deposits*</u>	<u>Percentage of Change</u>	<u>Loans and Discounts*</u>	<u>Percentage of Change</u>
<u>Chiloquin</u>				
Chiloquin Branch USNB	\$ 6,273	15.89	\$ 596	15.28
<u>Klamath Falls</u>				
Klamath Falls Branch FNB	39,051	8.30	13,481	(0.30)
S. 6th St. Branch FNB	16,871	8.28	4,942	20.24
Klamath Falls Branch USNB	29,779	7.39	16,217	27.87
Shasta Way Branch USNB	2,667	318.68	386	1,069.70
Town & Country Branch USNB	11,627	21.93	2,372	8.51
Klamath Branch Western Bank	15,147	5.62	11,468	19.65
Shasta Plaza Branch Western Bank	4,739	12.51	2,318	19.61
<u>Merrill</u>				
Merrill Branch FNB	<u>11,596</u>	<u>2.88</u>	<u>7,204</u>	<u>38.46</u>
Totals	\$137,750	10.40	\$ 58,984	18.50

\*All amounts expressed in thousands of dollars.

The Labor Force

Between 1970 and 1975, the work force increased by 16 percent, while population rose about 9 percent. Two factors explain this anomaly: first, the constant rise in the number of women entering the work force; second, the entry of the baby boom of the 1950's and early 1960's into the labor force. The largest rise in employment since 1970 occurred in non-manufacturing industries. The sharp increases in services and government reflect a public demand for not only more services, but also for varied service. The increase in population and in tourism contributed to an increasing employment.

## Economy - Current Conditions (6)

Klamath County Work Force and Employment  
by Sex and Minority Status  
April 1977

Sex and Minority Status	Work Force	Employed	Unemployed	Unemployment Rate
TOTAL both sexes	23,170	21,050	2,120	9.1
White	22,463	20,540	1,923	8.6
Black	163	116	47	28.8
Other races	544	394	150	27.6
Spanish American	498	463	35	7.0
Minority group*	1,205	973	232	19.3
TOTAL female	8,632	7,668	964	11.2
Percentage of both sexes	37.3	36.4	45.5	--
White	8,414	7,509	905	10.8
Black	83	51	32	38.6
Other races	135	108	27	20.0
Spanish American	164	153	11	6.7
Minority group*	382	312	70	18.3

\*Sum of Spanish American and all races except white. Some duplication possible since Spanish American may include nonwhite races in addition to white.

SOURCE: Oregon Employment Division

The following table shows Klamath County employment for 1976.

Klamath County Employment

	1970	1976	Percentage Change
Manufacturing	3,870	4,810	+ 24
Wood products	3,460	4,360	+ 26
Food products	150	120	- 20
Other	260	330	+ 27
Wholesale, retail trade	3,290	4,120	+ 25
Services	2,260	2,850	+ 26
Farm	1,640	1,250	- 24
Transportation, communications, utilities	1,460	1,480	+ 1
Contract Construction	470	630	+ 34
Government	3,280	4,319	+ 32
Finance, insurance, real estate	610	690	+ 13
Other	2,360	1,370	- 42
Total employment	19,240	21,519	+ 12
Unemployed	1,350	2,250*	
Percentage of labor force	7.0	10.0	

\*1975 Unemployment figure

SOURCE: State of Oregon Employment Division, *The Klamath County Economy: Status of Prospects*, May 1977.

## Economy - Current Conditions (7)

Median family income for 1974 ran about \$11,000; this rose to \$12,109 in 1975 and to \$12,751 in 1976. Per capita personal income in Oregon, 1974-1975, is estimated to have risen 6.25 percent from \$5,284 to \$5,610. Wage and salary rates in manufacturing (primarily wood products) and agriculture tend to be roughly equivalent to statewide averages. Entry rates in the lumber and wood products industry currently average approximately \$5.75 per hour (May 1977), while those in agriculture average \$2.75 to \$3.50. Piece rates are not as important a factor in agricultural wages as they are in many other Oregon agricultural areas. Basin wages for clerical and service occupations are generally lower than in other Oregon metropolitan areas due to competition stemming from a labor surplus created by the growing number of women entering the labor force, and by youth and military personnel seeking part-time work. Summer employment for youth is limited, because the area's agriculture does not employ large numbers of seasonal hand labor.

The current proportion of the total county population falling below the poverty level is 10.9 percent. Low-income elderly make up about 26 percent of those over 65 years. The average number of cases of General Public Assistance for 1977 was 59, while the monthly average for food stamp recipients was 3,435. Aid to Dependent Children averaged 744 cases per month serving 2,313 persons.

During the summer of 1977, the City of Klamath Falls surveyed some 2,200 county business firms. Those in the urban area who replied ranked manufacturing the number one business of economic importance, general retail next important, followed by wholesale supply and financial services. Forty-seven and one half percent felt that their businesses depended to some extent on tourists. Within the urban area, over one third felt they would expand their operation sometime within the next decade, presenting the possibility of over 475 new jobs. Only 5.5 percent of the urban businesses responding to the survey felt they might reduce or curtail present activities. Well over half felt they could hire local people with necessary skills.

## CITY FISCAL REPORT ADDENDUM

Local Government Economics

The purpose of this subsection is to analyze the City's past and current financial condition, and to review the future abilities of the City to obtain necessary funds for the capital improvement program to be adopted within the Comprehensive Plan, interlaced with the operational programs that heretofore have been provided as a basic level of services to the City citizens.

The character and nature of the population relates directly and indirectly to the community's financial situation. The ability of the City to obtain future funds will relate directly to the perceived level of services of the citizenry of the City. This is more specifically borne out by the present day tax revolt which is sweeping the country in relationship to property taxes. In the future, the citizens will be asked more and more for their input in the areas of authorization for bond sales relative to recommended improvements as generated by the local governing body.

Historically, Klamath Falls has depended to a great extent on the property tax as the principal revenue source for financing its services. Within recent times the dependence has fallen off because of the generation of other revenue sources outside of property tax for the provision of basic services. In 1940 the City of Klamath Falls' dependence on property tax for general services was 57.9 percent. In 1977, the percentage of dependence on property tax was 28.7 percent, indicating a decrease of 29.2 percent of dependence on property tax.

The approach of using property tax as a chief revenue source can be logically explained in that services historically provided by the City such as police, fire protection, street services were directly related to real, tangible property improvements. Moving away in recent years from such great dependence on property tax can also be explained logically from the standpoint that services required by the City citizenry have moved into other areas such as parks and recreation, sanitation, airport, and public restroom levies which do not directly correlate with real property values.

Also, the City's moving away from a large dependence on property tax can be explained by the limited amount of property tax dollars available to be distributed between other local governments such as the County and

school districts. The growth of education is financed largely by property tax and is crowding the City's taxing ability from the overall view of total property tax dollars available. It is quite apparent from this study that unless the State takes more responsibility for financing local schools, Klamath Falls and other Oregon municipalities will have to abandon property tax as a revenue source in favor of other revenues. Because of the motion away from dependence upon property tax, the limited number of financial avenues open to the City is becoming more apparent. The City will have to review more innovative procedures with which to finance the operation of the capital program required by the citizens. Within the City's Comprehensive Plan will be established a set of goals and objectives identified in the Comprehensive Plan process of neighborhood groups, town hall meetings, public hearings before the Planning Commission and the City Council. In the final analysis the implementation of the Plan and the component of the Plan referred to as the capital improvement program will rest upon the community's desire and ability to provide services with existing revenues, as well as its adaptability in generating sources with which to provide services and programs.

#### Financial Policies and Methods Regarding Capital Improvements

Historically, the City has provided for sewer, storm sewer, and water improvements by the issuance of general obligation bonds. The general obligation bonds traditionally have been retired with utility revenues and grants received from various special agencies rather than property tax. Specifically, as looking toward the future, the dependence upon obtaining Federal grants to accomplish the goals outlined in the Comprehensive Plan will become more and more necessary in the future.

The rationale on the use of general obligation bonds for capital improvements has been based on a historical analysis that general obligation bonds are sold at approximately two percent less interest rate than revenue bonds.

As far as improvements to general neighborhoods in the City, previous methods used have centered around local improvement districts and Bancroft bonding. Under this method, benefited property owners form a special assessment district in view of the City's bonding capacity to provide the necessary improvements. With the completion of the improvements the City issues

Bancroft bonds providing the financing mechanism over a period of 10 to 20 years; thereby the total cost of the project may be spread, with the property owner making semi-annual payments.

The City has developed procedures whereby new subdivisions developed within the City are responsible under the performance bond filed with the City to provide the necessary water, sewer, street, and sidewalk improvements according to the City's approved specifications. Once the improvements are completed, the City assumes the responsibility for maintenance and also the cost apportioned with that responsibility.

In relationship to providing the public buildings relative to the services generated, the City historically has relied upon other revenue sources besides the property tax. They have relied on general revenue sharing, Federal grants and the general fund for the necessary funding for the public buildings and necessary attachments thereto.

The allowable bonding dependence of Oregon municipalities is limited by State statute to three percent of assessed valuation. The three percent limitation does not include bonds for municipal utilities or bonds issued for improvements, such as streets, which are paid for in installments by assessments against the benefited property. The total bonds outstanding as of June 30, 1977 were \$1,343,399.63.

As of June 30, 1977 the City had no outstanding utility bonds because the early retirement of the 1968 sewer bond was accomplished through the obtaining of EPA grants paying for approximately 50 percent of the project. The City of Klamath Falls is in the envious position of having no net debt; net debt is defined as gross debt less sewer, water and special assessments. The position is one that is very rare within municipal finance. The explanation of no debt of the City can be seen in the reluctance of past City Councils and Budget Committees to ask the citizens of Klamath Falls for funding outside of its general revenue sources for public facilities. Past Councils and Budget Committees have provided the funding for services routinely paid for by other municipalities with bonded indebtedness through the use of general fund and Federal revenue sharing. It should be noted that historically the City has depended upon continuing millage levies which were not allowed after 1962 for such services as parks, recreation, cemetery, airport, fire operations and public restrooms.



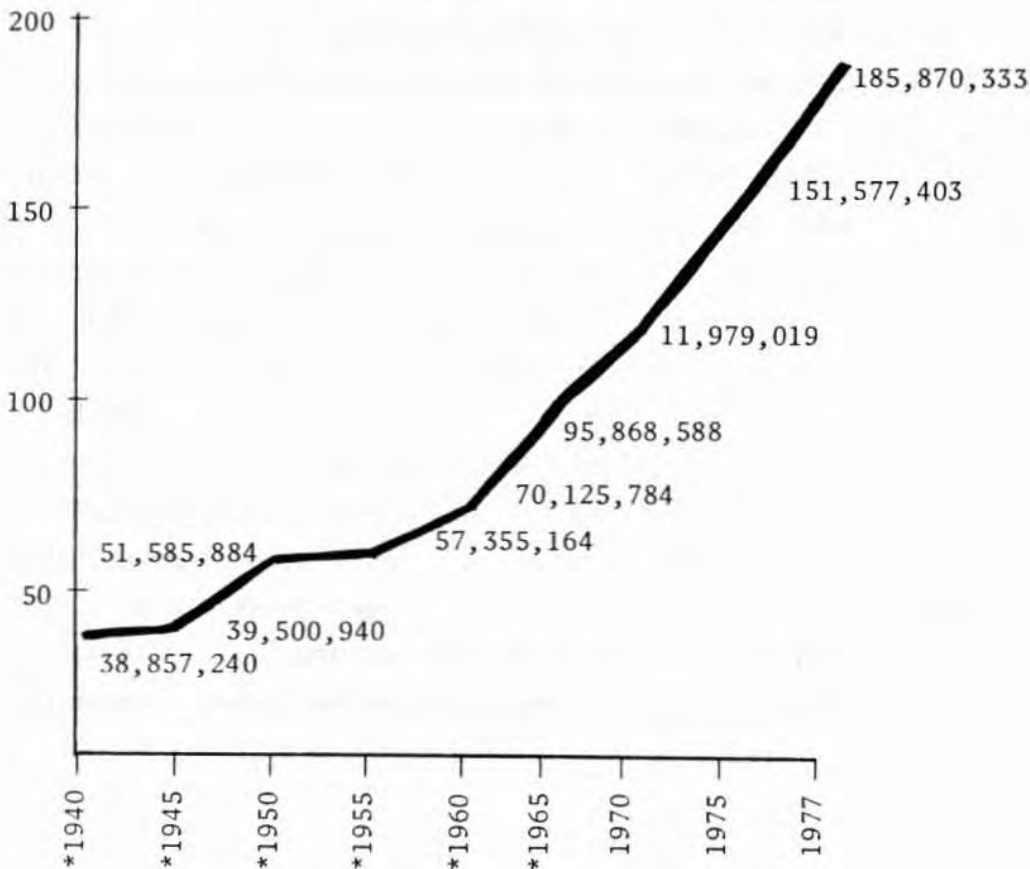
Provisions of the continuing levy allow for funding to continue for various operational funds and generated the services required not only by the citizens of Klamath Falls, but also the residents of the urban area which use the services of the funds listed above.

Property Tax Trends - The Assessed Valuation

Figure EC-1 displays the property valuations for Klamath Falls adjusted to 100 percent of assessment. The valuations remain relatively stable for the period of 1940 to 1960. From 1960 to 1970 the assessed valuation of the City rose dramatically from over \$70 million to \$112 million. During the period from 1970 to 1977, the property valuations continued rapid acceleration, moving in a seven-year period \$74 million in comparison to the period from from 1940 to 1969 where the assessed valuation increased by approximately \$31 million.

EC-1

VALUATION  
 Klamath Falls Property Valuations  
 \*Adjusted to 100 percent true cash value



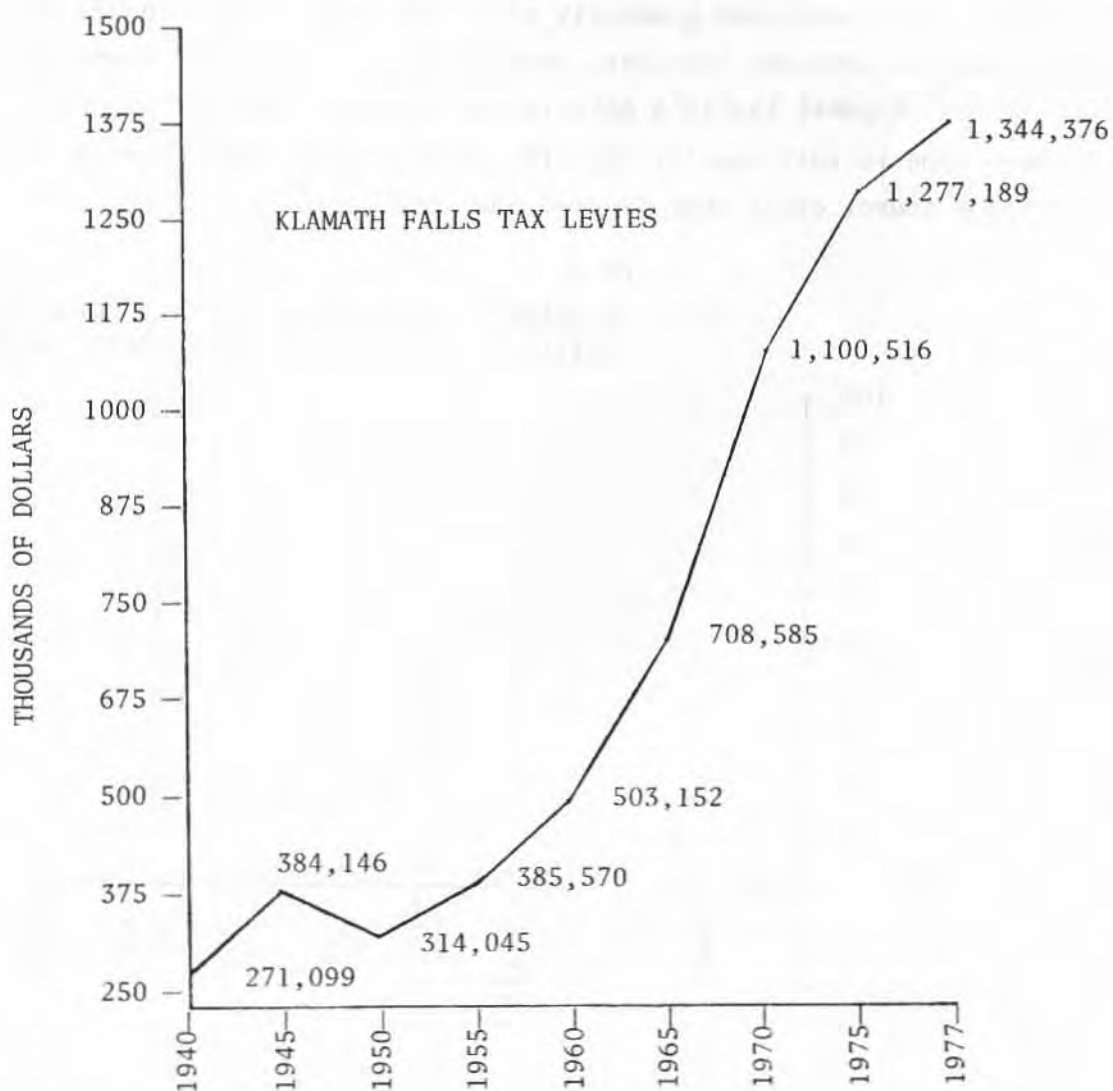
### Tax Rate and Tax Revenue

Revenues to City government from the property tax have changed substantially as indicated above.

In 1940 the City of Klamath Falls boasted a population of 16,497 people living in the City with 100 percent assessed valuation of \$38,867,000. The tax rate adjusted for the County assessment ratio was \$6.98/\$1,000 assessed valuation. Since 1940 the City of Klamath Falls has grown substantially. Throughout that period of time, the tax rate has fluctuated a great extent, from a high of \$9.94 in 1973 to the 1977 levy of \$7.18 in comparison to \$6.98 in 1940.

While the tax rate has fluctuated with the assessed valuation, the income from the property tax has dramatically changed. The City has increased revenue from property tax in the amount of \$1,020,000 from the \$271,099 collected in 1940 to the 1977 collection of \$1,344,500. See Figure EC-2.

EC-2

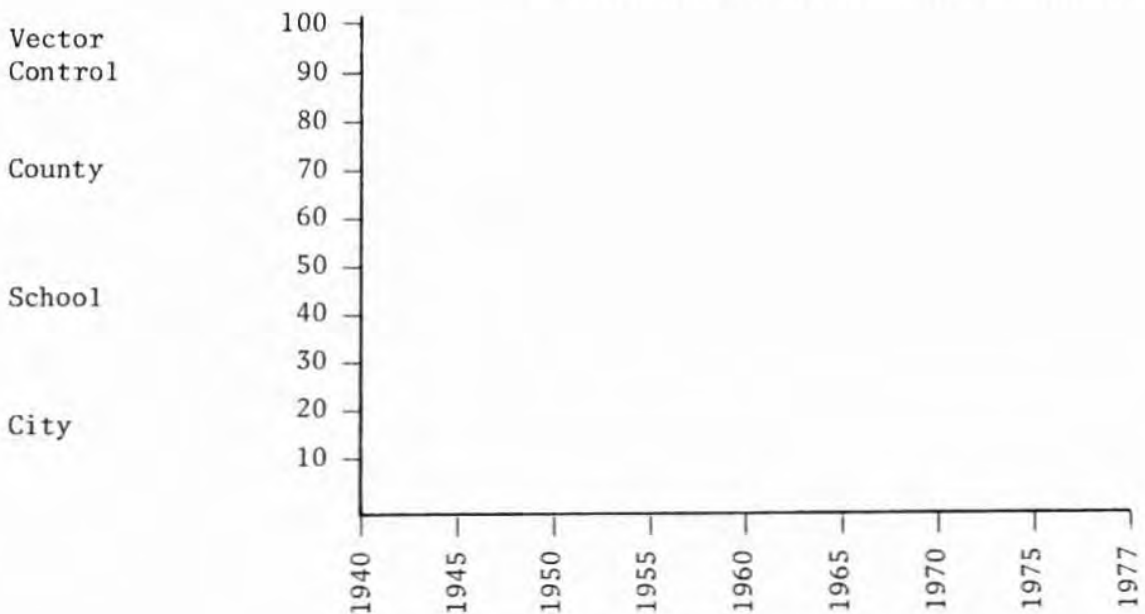


I should again point out that the City Council and the Budget Committees of the City of Klamath Falls have been very reluctant to take tax levies to the voters for approval. This conservative fiscal attitude has helped maintain the City in a solvent financial operation, without yearly dependence on property tax increases over and above the six percent limitation. The last levy to be taken to the people was a fixed levy for higher services in 1962.

Distribution of total tax levy collected per capita in City tax and the distribution of local property tax to various governmental units has dramatically changed since 1940. (See Figure EC-3.) In 1940 there was somewhat of an even distribution between the City and County schools of the total property tax levy. That even distribution was approximately 30 percent. Since 1940 the City and County have had to come to rely on other sources of the property tax while the school districts have increased their share of property tax allocation from 29 percent in 1940 to 56 percent in 1977. The proportion of the total property tax levied by the County and City has declined gradually since 1940, while the schools have accounted for the greatest increase, locally as well as in the state, of the use of the property tax as a main revenue source. The school districts have come to rely heavily upon the property tax since it is their major revenue source other than Federal and State grants.

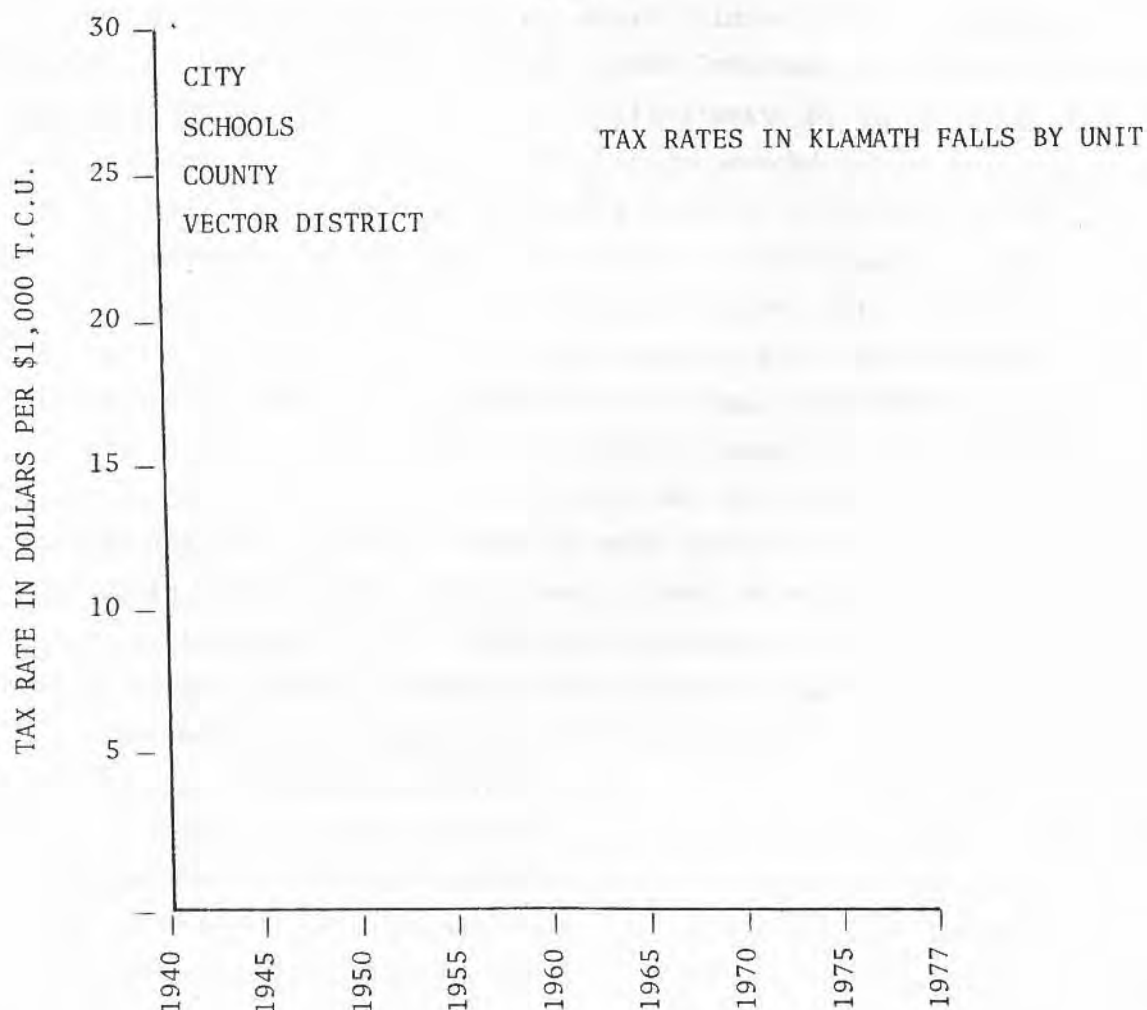
EC-3

PERCENTAGE DISTRIBUTION OF PROPERTY TAX LEVIES BY LEVYING UNIT IN KLAMATH FALLS



The City and County have developed more diversified approaches to raising local revenue, primarily through user charges and fees for a wide variety of services provided by the governmental units. In 1977 the City general fund was financed by only 31 percent property tax funds and the remaining 69 percent from other sources. Figure EC-4 indicates that without the proportionate increase of property tax levies by the school district, the City and County have remained relatively stable in relationship to the property tax levies levied in 1940. Figure EC-4 also demonstrates the period of time where school districts' dramatic increase and reliance on property tax took place, mainly, the period of time from 1950 through 1960. School district reliance again demonstrated a sudden upsurge during the period 1965 to 1970 in relation to assessed valuations. The school districts along with the City and County have demonstrated in the period from 1970 to 1977 a decline in the tax rate per \$1,000.

EC-4



In summary, tax rate and property tax valuation are the two factors which determine local property tax revenues. The valuation of property has skyrocketed in recent years due to inflation, annexation of property and services rendered which directly relate to property value. There has been a relative reduction in the City tax rate over the period 1940 to 1977, but there has been an overall increase in revenues collected by the City. This is an indication of the spreading of the tax base between more users of the services provided by the City and relates to the theory that the spreading of the tax base provides for the local services at a more economical and efficient use of Klamath Falls revenue sources.

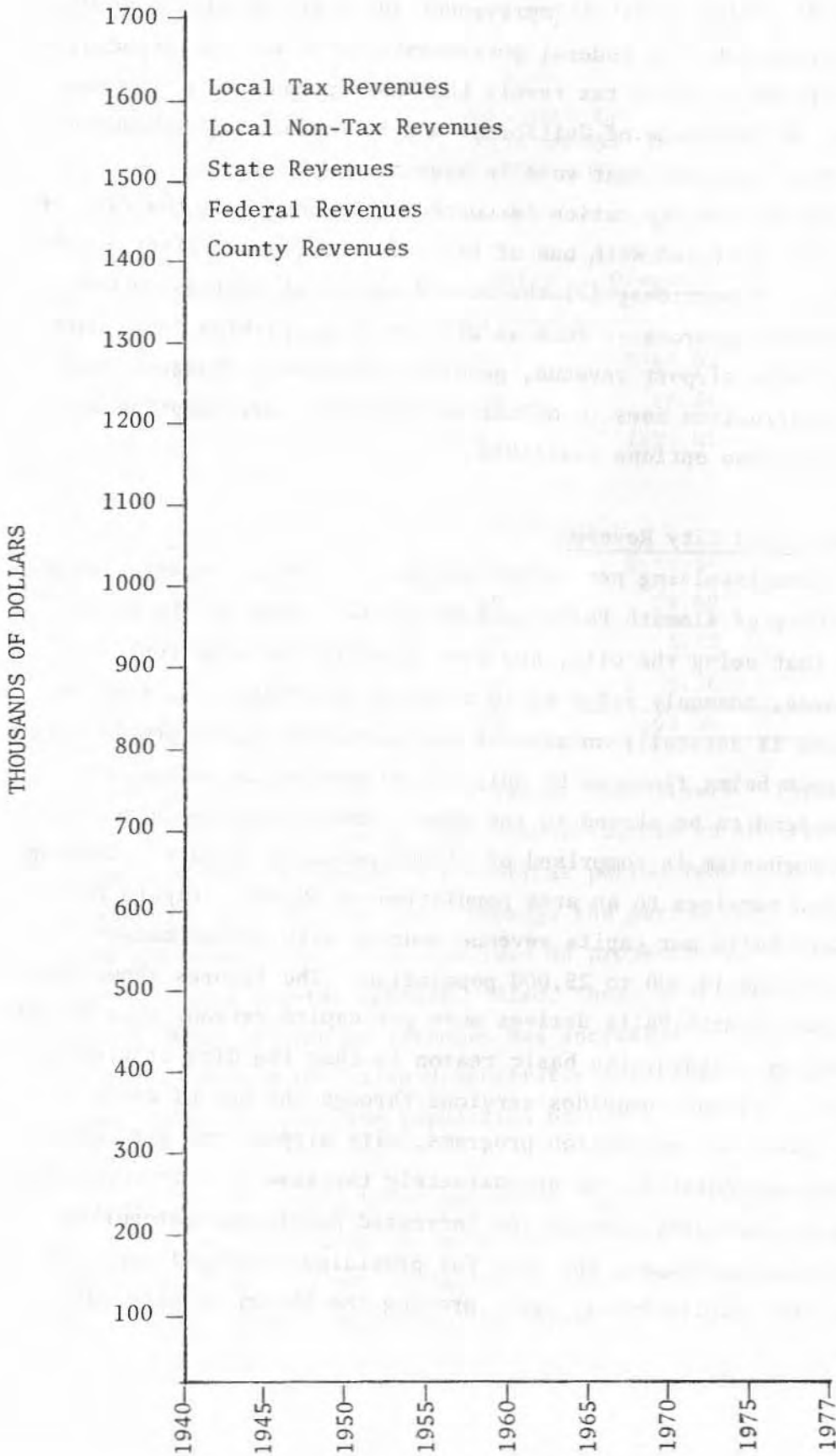
#### Trends in Klamath Falls Revenue Sources

In the period 1940 through 1960, all revenue sources with the exception of County revenues were to the greatest extent stable. For the period 1960 to 1977, the areas of local tax revenues (which include not only property tax but franchise taxes, payments in lieu of taxes, business licenses and occupational taxes), local non-tax revenues and Federal revenues have increased dramatically. It should be pointed out, as has been indicated in the aforementioned, that the City has continued to increase its reliability on revenue from non-tax resources in the last 37 years. This is demonstrated by the accelerated increase depicted in Figure EC-5 of non-tax revenue sources, which in 1977 amounted to over \$1,600,000 while local tax revenues amounted to \$1,300,000. This is in comparison to 1940 where local non-tax revenues were \$200,000 and local tax revenues were just under \$300,000, again indicating a change of revenue sources available to the City.

The most dramatic increase from the period 1970 to 1977 can be seen in the City's dependence on Federal sources for the providing of continuing services in capital improvement projects. It is especially critical to look at the trend of increased revenue from the Federal source in light of future capital improvement projects and services to be rendered. In 1970 the City received from the Federal government \$12,808. In 1977 the City received \$572,844 in revenue. In 1978 the City will receive \$3,998,236, with the main use going to capital improvement projects in the area of geothermal development, sewer development, street projects, and airport construction. The 1978 figure indicates a per capita amount

EC-5

GENERAL REVENUE SOURCES  
FOR KLAMATH FALLS



returned to the City by the Federal government of \$231.31, in relationship to the 1977 per capita amount which is \$.81.

As indicated by Figure EC-5, the major trends to look in regards to future revenue for future capital improvement again are non-tax revenue sources and sources from the Federal government. This will be especially true in light of the property tax revolt that has spread the nation and has been passed in the State of California and is tentatively scheduled for the constitutional amendment vote in November of 1978.

If the property tax limitation is successfully approved, the City of Klamath Falls will be faced with one of two options: (1) the first option being the cutting of services; (2) the second option of increasing non-property tax revenue sources -- such as utility fees, parking fees, park and recreation fees, airport revenue, general development charges, land use fees and construction fees to offset service cuts; or, adopting a combination of the two options available.

#### Per Capita Amounts of City Revenue

The situation involving per capita amounts of City revenues is very unique to the City of Klamath Falls because of the status of the incorporated area, that veing the City, and the status of the huge non-incorporated area, commonly referred to as South Suburban. The Klamath Falls urban area is basically an area of approximately 35,000 people with a governing agent being financed by only 17,000 people; therefore, per capita figures tend to be skewed to the upper amounts because in reality the financing mechanism is comprised of 17,000 people which are providing in essence urban services to an area population of 35,000. Figure EC-6 compares Klamath Falls per capita revenue sources with cities between 25,000 to 50,000 and 10,000 to 25,000 population. The figures shown indicate the City of Klamath Falls derives more per capita revenue than cities in either category. Again, the basic reason is that the City of Klamath Falls taxpayer in essence provides services through the use of city streets, city parks and recreation programs, city airport and city police to a large non-incorporated area approximately the same size in population. Figure EC-6 also indicates through the increased population categories that as population increases, the cost for providing municipal services decreases on a per capita basis, again proving the theory of more cost

effective services with a larger population or tax base providing the service. Figure EC-6 also indicates that the City of Klamath Falls has continually relied more heavily upon other outside sources of revenue such as Federal, State and inter-local governments for revenue than other Oregon

EC-6  
COMPARISON OF  
PER CAPITA AMOUNTS OF  
KLAMATH FALLS REVENUE SOURCES WITH OTHER OREGON CITIES

Source	Klamath Falls	10-25,000 Population Oregon Cities	25-50,000 Population Oregon Cities
<u>Own Sources</u>			
Tax revenues	\$ 85.16	\$ 64.60	\$ 53.93
Local non-tax	62.79	58.34	54.18
Total General Revenues From Own Sources	\$147.95	\$122.94	\$108.10
<u>Other Governments</u>			
Federal	\$ 39.30	\$ 46.54	\$ 34.62
State	21.49	24.69	21.12
Inter-local	1.25	5.13	10.14
Total Other Government	\$ 62.04	\$ 76.36	\$ 54.88
TOTAL REVENUE	\$209.99	\$199.30	\$173.98

cities its size and also cities larger than itself. Figure EC-7 compares the City of Klamath Falls' own revenue sources to the revenue derived from other governments through a historical period from 1958 through 1974. Figure EC-7 demonstrates that through the period 1958 through 1974, the City has come to rely less and less on property tax revenues and more and more on local non-tax sources. Also, there is a demonstration that the use of other government revenues has increased through the same period of time. Figure EC-7 also demonstrates the relationship of the City to other cities in the same population bracket.

#### Evaluation of Present Local Government Economic Characteristics

The City's ability to raise revenue with the property tax is very limited. A major limiting factor is the overall increase in the last 25 years of the school districts' reliance on the property tax as a major



EC-7

COMPARISON OF PERCENTAGE OF TOTAL REVENUES  
WITH OTHER OREGON CITIES 10-25,000 POPULATION

SOURCE	1958-59			1963-64			1968-69			1973-74		
	KLAMATH FALLS	OTHER CITIES	KLAMATH FALLS	OTHER CITIES	KLAMATH FALLS	OTHER CITIES	KLAMATH FALLS	OTHER CITIES	KLAMATH FALLS	OTHER CITIES	KLAMATH FALLS	OTHER CITIES
<u>Own Sources</u>												
Tax revenue	46.0	50.1	59.5	52.4	53.9	39.8	40.7	33.7				
Local non-tax	<u>21.4</u>	<u>25.6</u>	<u>22.5</u>	<u>24.0</u>	<u>26.1</u>	<u>29.0</u>	<u>29.9</u>	<u>29.3</u>				
TOTAL Own Sources	67.4	75.7	82.0	76.4	80.0	68.8	70.6	63.0				
<u>Other Governments</u>												
Federal	16.1	1.7	-0-	3.0	1.5	9.6	18.4	21.3				
State	14.3	17.8	16.5	16.9	17.0	17.9	10.3	12.7				
Inter-local	<u>2.2</u>	<u>2.6</u>	<u>1.5</u>	<u>1.2</u>	<u>1.5</u>	<u>3.6</u>	<u>.6</u>	<u>3.0</u>				
TOTAL Other Governments	32.6	22.1	18.0	21.1	20.0	31.1	29.3	37.0				

NOTE: Percentages may not total 100 percent due to rounding.

SOURCE: "Revenue Sources of Oregon Cities" for 1958-59, 1963-64, 1968-69, 1973-74.

revenue source. Historically the school districts on a yearly basis have gone to the voters for an increase in property taxes over and above the six percent limitation. Because of the sharing of the total property tax levy it becomes very difficult for other units of local government to proceed outside the six percent. Another hindrance on generating revenue from property tax is the possible property tax limitation, known as Proposition 6, to limit property taxes to 1.5 percent of assessed valuation. The limitation will in essence drop the total City levy for all units of government from \$21.00/\$1,000 to \$15.00/\$1,000. The distribution of the \$15.00 levy will be in accordance either with State mandated ratios or based on ratios of the current year's levies. If the property tax limitation is passed, future reliance on property tax as a major revenue source for capital improvement programs will become a non-factor. Any property tax revenue will only be used to provide basic services.

#### Revenues from Other Governments

As indicated above, the City of Klamath Falls came to rely more and more on revenues from other governments and especially the Federal government in order to finance capital improvements. At this point it can be reiterated by looking at the percentage increases, not only from 1970 to 1977, but the years from 1977 to 1978. In 1970 the City received only 16 percent of its general revenues from other governmental sources. In 1977 the total was up to 26 percent. The year 1978 will be seen as the year of change in heavy reliance upon other governmental revenues for capital improvement programs. In 1978 the City of Klamath Falls received approximately \$3,988,236 in revenues from other governments for capital improvements. With the property tax limitations expressed above, the reliances on other government resources will become more and more important if the City is to continue to provide necessary capital improvements that its citizens feel necessary.

#### Local Non-Tax Revenue

Klamath Falls is apparently ahead of other Oregon communities in obtaining general revenue from local non-tax sources such as user charges, fees, fines, forfeitures, interest payments, special assessments and utility revenues. According to a League of Oregon Cities study done in 1975 for Fiscal Year 1973-74, the City of Klamath Falls on a per capita basis has

generated \$62.79 in local non-tax revenue versus cities of similar size generating \$58.34 in local non-tax revenues.

As a future revenue source for capital improvement programs, this type of revenue is not seen as a major contributor, the reason being the local non-tax revenue sources are in many instances generated for specific programs such as water and sewer services, and to a great extent will not generate sufficient revenue for an overall capital improvement program designated by the citizens of Klamath Falls.

#### General Obligation and Revenue Bonds

The legal debt limit for Klamath Falls as of June 30, 1978 was \$5,550,000. The City has not in the past used general obligation revenue bonds as a method of financing capital improvements. General obligation and revenue bonds have been used only for sewer and water programs and are not subject to the Oregon statutory limitations. Therefore, the City has not infringed on any limitation of sources available under the bonding limitation. The revenue or general obligation bond procedure would appear to be a viable method to raise revenue for capital improvements, limited mainly by the local taxpayer approval to increase his taxes or user fee. The general obligation and revenue bond procedure would be a direct method of financing. Due to the necessity of voter approval for the issuance of such bonds, the voter would have a direct say in the capital improvement programs which he wished to see initiated.

#### Implications of Future Government Financing

##### A. Major Capital Improvements.

Klamath Falls for the most part may not be able to finance the total planned public improvements, that is by property taxes and local non-tax revenues because of the attrition of the City's share of the property tax, current state limitations placed on local governments in reliance on the property tax and possible future, more conservative and strict limitations on the use of property tax. Other sources of financial assistance from State and Federal governments and to an extent from the County, must be sought and utilized if its citizens desire to maintain a livable community as the area's population expands.

Among the many general methods used in financing capital outlay items, the four considered here seem to be the most common and desirable:

1. Payments in Advance. This may be made possible through a capital improvement fund or a capital reserve fund initiated by the City which calls for creation of an amount of revenue to be set aside to assure participation in future debt or future requirements. The City has used this procedure in the past, establishing capital reserve funds for the purchase and construction of capital items from revenue generated from the general fund and revenue sharing. As of July 1, 1978, the City had within its capital reserve appropriated and unappropriated funds in the amount of \$925,835.
2. Pay as You Go Policy. This policy is generally considered the most desirable when the size of the capital outlay is relatively small and when there are sufficient resources available to meet the expense without creating a burden on the City's general fund. This option appears to be less viable in the future because of the continuing escalation of capital outlay programs.
3. Borrowing. This may include the issuance of bonds or bond anticipating notes. Borrowing is the most commonly used method of financing capital outlay items in the State of Oregon, but has tended not to be used by the City of Klamath Falls. But, as more and more restrictions are placed on the general revenue sources of the City, borrowing may be a main source of revenue in which to initiate the capital improvement programs, again, if approved and desired by the City voters.
4. Subsidies or Grants-in-Aid. As has been indicated throughout this portion of the Plan, subsidies and grants-in-aid have become a major portion of revenue available to finance capital improvements. This is seen as a continuing process to provide the programs that are desired by the citizens of the City. Subsidies and grants-in-aid may become in the future a more intensified action program of the City in attempts to obtain the competitive funds available through the State and Federal governments for various capital improvement programs.

These four methods of financing are primarily used with the following objectives in line: the lowest possible cost; a stable tax rate; a low debt in relation to resources. It is quite possible that Klamath Falls might and should utilize all four methods of financing capital programs as identified in the Comprehensive Plan.

Borrowing on a short term basis would be feasible when grants for particular projects are not available currently but will be available in the near future for reimbursement of the project. Borrowing would be feasible when the interest paid on land and facilities would not rise as rapidly as the cost of the land and utilities. In other words, if property values are booming, it may be cheaper to borrow the money and buy the property now than to wait until the price doubles and the grant is available. Borrowing may also be used if sufficient funds from other sources are not available as matching requirements in relationship to obtaining grants from various other governmental agencies. Another advantage of borrowing is those that benefited in later years from the improvements also will help to pay through tax rates or user charges, whereas in a direct purchase with no borrowing, only the existing citizens pay and future users of the improvement who use and benefit from the programs do not contribute.

#### Potential New General Revenue Sources

Even if the City is able to finance capital improvements with its limited revenue sources, the continuing and on-going maintenance and operation and up-keep of those projects represent a large fiscal hurdle for the community in the future. The property tax apparently will no longer be a viable source of general revenues. The sources listed below have been reviewed by the City administration and review potential new revenue sources for the City. Listed below are only a potential list of revenue sources which would have to receive approval of City Council, and in some cases a Charter amendment approved by the voters of the City.

Income Tax. In 1939 the City of Philadelphia passed an income tax which was applied to the earnings of all the residents regardless of

whether their employment was in the City or not and upon the salaries and wages of all non-residents who work within the City.

Utilizing previously obtained figures and some assumptions, it would appear that the adjusted gross income from within the City of Klamath Falls is somewhat in excess of \$124,000,000 annually. Therefore, a tax of one half of one percent of that income derives an annual sum of \$620,000 to the City. The State of Oregon is empowered to collect such taxes for local government and will do so on a formal request payment of an administrative charge. The advantages of a municipal income tax are:

1. Taxation of those who use City services, but who may not directly contribute financially otherwise to the service provided;
2. The great revenues it produces to the City;
3. High response to inflation and growth;
4. Low administrative costs; and
5. It is relatively simple, direct and non-regressive.

The viability of an income tax is that it would be highly controversial, predominantly because of the pioneering aspects within the State of Oregon.

Retail Sales Tax. The first local sales taxes to be levied in the United States were in New York City in 1934 and New Orleans in 1936. In other states in which a local sales tax is levied, excepting Alaska, there is also a State sales tax. The Oregon legislature has authorized the Department of Revenue to enter into agreements with local governments to collect, enforce, administer and distribute local sales tax. The sales tax is generally levied on most retail sales at a uniform rate, collected from the purchaser at the time of purchase and identified as such when the purchase is made. Often general sales tax excluded certain sales such as drugs, repair services, and local transportation.

Based on estimates generated from the 1977 editors and publishers market guide, retail sales in 1977 within the City of Klamath Falls were slightly over \$126,000,000. Assuming certain exemptions from these sales and other possible exclusions or reductions, this would indicate a one percent sales tax and the City of Klamath Falls would yield \$1,100,000 to \$1,200,000 annually. The benefit of a sales tax is:

1. Primarily, it produces a substantial yield;

2. It truly catches the community service user such as tourists and others who did not otherwise provide any resource for the services utilized;
3. Payment being made in small increment does not develop emotional reaction of a once-a-year substantial payment such as a property tax or income tax;
4. Its flexibility in respect to community growth, increased sales and inflation;
5. The administrative costs of such tax are traditionally low, ranging from .8 percent to 2.5 percent.

A detriment of a general sales tax is, again, the pioneering aspect and also the regressive feature of the tax and actual, psychological City Limits barrier in relationship to businesses outside the City. Finally, the retailers involved would heartily resist such a tax obligation, listing the administrative detail costs as a detriment along with the appearance of driving customers out of the City.

Utility Surtax. The utility user surtax is extensively used in the State of California and many other states. The tax rate imposed in California varies from one percent to five percent, the majority utilizing the five percent rate.

The benefits of a utility tax are substantial in that it is a stable tax and it follows the growth of the economy and inflation. Additionally, it is economic to administer, it is paid a bit at a time and receives less resistance and would include renters and lessees heretofore exempt along with other property tax exemptions. Plus, finally it would invoke a direct charge on institutional facilities within the City that have traditionally enjoyed exemption from tax payment at the same time as benefiting from certain services.

The disadvantage of the utility tax is that it is regressive in nature; however, this can be mitigated. Finally, it is a pioneering tax effort in the State of Oregon that would most likely be bitterly contested by the utility companies to say nothing of the paying citizens.

In Lieu of Taxes. In lieu of taxes is a relatively new concept that has been generated in reference to payment by the Federal government, state, counties and other non-tax supporting institutions. Federal in lieu of taxes payment has been revenue sent to certain counties in the State of

Oregon. In lieu of taxes is funding which the county would have otherwise received on land if not held in Federal ownership.

From the municipal financing standpoint, it would seem to be a direct correlation that services provided to such Federal and other governmental buildings as post offices, county courthouses, state office buildings, college campuses in the way of police and fire protection and parks and recreation programs should be revenues transferred for use of such municipal services.

The implementation of such in lieu of taxes would be based on negotiated agreements between the appropriate governmental levels. One example of implementing the amount of transfer in lieu of taxes would be based on the assessed valuation relative to specific services used by governmental agencies; i.e., courthouses and post offices generate certain benefits by the lower City fire rating and thus proportionately should pay an amount to receive that fire service. The benefits of such a transfer spreads the cost of the service more equitably from the City citizen to the user of the services.

Real Estate Transfer Tax. The mechanics of the real estate transfer tax can be very complex, utilizing such features as exemption of the mortgage portion exemption of everything except property appreciation. However, most examples of the real estate transfer tax utilize the direct gross price approach excluding contracts and escrow agreements. In Oregon where the county records property transactions, any tax effort would have to be negotiated with the county for cooperation and their administration of the collection. The potential yield of such a resource is variable with the best information available indicating 1977 deeded real estate transactions within the City were over \$34,800,000. A tax rate could raise up to roughly \$120,000 annually on such transactions. The administrative costs of such tax procedures would be approximately two percent.

In summary, it should be reiterated that the above information is substantially superficial and all figures quoted should be taken as very rough approximations; also, that any establishment of the above revenue programs would be done through Council action with appropriate public hearings and the possibility of voter approval. It should also be noted that any move toward implementation of the above will meet opposition from one or more special interest groups in the eventual levy of the revenue source.



Final Summary

The future financial situation of local government of the City of Klamath Falls is at a turning point. The turning point evolves around the successful implementation of capital improvement programs through borrowing and future use of grants from other governments. The City will also be faced, if Proposition 6 is successfully passed, with implementing policies and deriving revenue sources to provide not only for capital improvement programs, but also for the providing of basic services which the citizenry has come to expect of the City

As has been indicated throughout this portion of the Plan, the property tax can no longer be seen as a viable avenue for operational funding and will be extremely limited in funding any proposed capital improvements. In light of the current taxpayer feeling regarding higher taxation at any level for any service, it seems that in the future the taxpayer will be more and more in control of financing capital improvement programs and operational services through the voter's box. Through the voter's box tax paying citizens will determine the level of services which they will require and need and the capital improvements they deem necessary for community in light of the standards developed by consensus of the voting population.

### Economy - Problems (1)

- The lack of adequately serviced and suitable vacant land is a handicap to industrial expansion.
- Most of the job market supply is by migration from other population areas, not local.
- Irratic zoning in the urban area inhibits economic growth.
- Inflation is affecting land values and supply costs.
- Roughly 90 percent of the manufacturing employment is in lumber and wood products, creating need for diversification.
- There is a surplus labor force, particularly of women and youths.
- The phase-out of Kingsley Field, which contributes about \$10 million to the local economy, is a possibility.
- Urban sprawl of the city without a proper tax base of land has led to a rising property tax burden.
- Rising energy costs created increased transportation, utility and other costs.
- There is limited conflict between industrial, agricultural, and water uses of Upper Klamath Lake, Link River, Lake Ewauna, and Klamath River.
- Commercial and industrial development will have to expand to meet future growth needs.

D E T A I L E D   A S S E S S M E N T   N O T E

SUB-ELEMENT:    ECONOMY

THE CONTENT OF THIS SUB-ELEMENT IS SUPPLEMENTED BY THE FOLLOWING DETAILED ASSESSMENTS WHICH WILL BE ADOPTED BY REFERENCE WITH THE COMPREHENSIVE PLAN.

KLAMATH COUNTY OVERALL ECONOMIC DEVELOPMENT  
PLAN

OREGON EMPLOYMENT DIVISION ANNUAL COUNTY  
STATUS REPORT

COPIES OF THESE ASSESSMENTS MAY BE AVAILABLE FROM THE ORIGINATING AGENCY OR CAN BE INSPECTED AT THE CITY PLANNING DEPARTMENT OFFICES.

### Economy - Future Alternatives (1)

- No major expansion in wood products will limit economic growth in the area.
- The continued mechanization of agriculture reduces the number of farm jobs.
- Tourism and recreation continue their moderate growth as part of the area's economic base.
- Service industries will continue their moderate growth.
- Industrial use of geothermal water may accelerate rapidly.
- Energy costs or availability will greatly restrict available industry and jobs.
- There may be adverse effects on small local businesses if commercial chain stores continue to expand in the area.
- What will happen if one of the major industries shuts down due to economic or energy crisis?
- Tax reforms may change tax loads on citizens, and may cause a loss of jobs and services that are tax supported.

Economy - Goals (1)

- To diversify and improve the local economy.

### Economy - Policies (1)

- Tax reforms that would reduce dependence on property taxes should be supported.
- Research to increase diversification within the lumber and agricultural industries should be supported.
- Adequate infrastructure facilities and services to industrial and commercial areas should be ensured.
- New, non-polluting industry that can use O. I. T. students during their education and O. I. T. graduates should be sought.
- Klamath Falls' position as the retail center for south-central Oregon and northern California should be strengthened wherever possible.
- Existing and planned commercial and industrial areas should be protected from encroachment from incompatible land uses.
- The comparative economic advantages of Klamath Falls as contrasted with other areas should be identified and promoted.
- Appropriate improvements in local conditions should be made in order to attract private capital investment.
- In developing City regulations, careful consideration should be given to any possible adverse economic impacts resulting from them, and appropriate mitigating measures should be attempted.
- Development which will assure the city of an adequate tax base should be encouraged and supported.
- State and Federal financial assistance policies that recognize the special needs of small, rural communities with high unemployment and limited base economies should be supported.
- The retention of Kingsley Field's mission should be promoted, and alternative uses for the facilities, if the field is closed, should be prepared.

Economy - Policies (2)

- Development should be controlled to provide maximum efficient use of public services and facilities.
- Public services should be consolidated wherever feasible, i.e., police, fire, waste disposal, schools, et cetera.

### Economy - Implementation Measures (1)

- The public should have access to education and involvement.
- The City should support and cooperate with the Klamath County Economic Development Association, maintaining a complete inventory and information for use in attracting non-polluting industries.
- Efforts to retain Kingsley Field or to prepare to take over operation of the facilities should be continued.
- Review of the land use needs of the urban areas should continue.
- Grant support of geothermal heating district should continue.
- A broader tax base should be sought to help reduce the property tax base.
- Public services and utilities should be provided at a minimum cost in face of continuing population demands.



M A P N O T E

SUB-ELEMENT: ECONOMY

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP  
DEPICTING THE FOLLOWING ITEM:

EXISTING AND UNDEVELOPED COMMERCIAL  
AND INDUSTRIAL SITES

THIS MAP CURRENTLY EXISTS IN ROUGH DRAFT ONLY, AND IS  
NOT AVAILABLE FOR REPRODUCTION. HOWEVER, DRAFT COPIES  
ARE AVAILABLE FOR INSPECTION AT THE CITY PLANNING  
DEPARTMENT OFFICE.

## ENERGY SUB-ELEMENT

## Energy - History (1)

Geothermal

Klamath Falls lies above what is called a Known Geothermal Resource (KGR), a new title for a phenomenon known for centuries.

Basin Indians used this energy long before any geothermal technology was developed. Later the settlers took advantage of the readily available hot water to make their existence a little easier. By the turn of the century, those living near existing springs or hand-dug shallow hot water wells were using the energy for heat as well as for cooking and cleaning.

By 1925, residents had begun drilling wells using cable drilling equipment. Because of lack of knowledge of the natural convection movements of hot water (thermosyphoning), these wells were pumped by a plunger pump circulating the geothermal waters through the heating system. The waters corroded and scaled the plumbing. Almost all of the early wells were dug or drilled in the lower Pacific Terrace-Hillside area where the energy was readily available.

In 1929 the first down-hole heat exchanger (coil) using the thermosyphoning principle was installed at 519 Pacific Terrace. In 1937 the last plunger-pumped well at Alameda and Esplanade was abandoned, and the closed-loop coil became the principal method of extracting heat. Now, coils filled with City water run into the wells a hundred feet or more below the level of the water; the well heats the coil and the City water. The heated City water returns to the surface as a usable source of heat.

The residential wells in the Basin vary in depth between 90 and 100 feet. Those wells used to heat larger establishments such as schools or the hospital are deeper, some over 1,800 feet beneath the land surface. Because of the layered and channeled nature of the underground geothermal resources, wells drilled side by side do not always produce similar results. One well, over 1,000 feet deep, remained dry; yet only 250 feet away was a well 220 feet deep producing hot water. These dry wells often have high rock temperatures, but fail to provide the medium, such as water, to transfer the energy. These are known as mud wells and with a down-hole heat exchanger do produce some heat, but not as efficiently as do the hot water wells.

## Energy - History (2)

Casing in the early wells was thin and only deep enough to cut off the cold water. The wells would often cave in below the casing, causing the water to cool. Those wells had to be cleaned every few years. More advanced practices have helped to eliminate these problems, and current expected life of the well approaches 50 years.

Klamath Falls is noted for some of its unique uses of geothermal energy. In addition to heating approximately 500 residences and commercial buildings, geothermal energy warms the swimming pools and keeps ice off the pavement on Esplanade Avenue. A local creamery uses 181°F water from its well to pasteurize milk, and the ice plant placed closed-loop heating coils three feet below the floors of the cold storage warehouse to prevent the soil from freezing and frost heaving. Oregon Institute of Technology in the past few years has experimented with geothermal waters for greenhouse heating and aquaculture. Also, the laundry facilities at the nearby hospital use the naturally heated, Known Geothermal Resource Area waters.

### Solar Energy

Sunshine and the thermal energy it provides have always been used directly, but only recently has technology been able to store this energy for later use. Subsequently, several types of solar energy collectors -- many homemade -- have been put to use in the Basin. The exact date of the first solar energy collector for domestic heat in the Basin is unknown, but the practice is rapidly expanding.

### Electrical Energy

The flowing waters of the Link River have provided Klamath Falls with electrical power for over three quarters of a century. The Klamath Falls Light & Water Company, owned by George Baldwin, built the first plant in 1895 on the east side of the river. A water wheel, run by water piped through a two-foot square wooden flume for 250 feet, provided the energy for the generator. This supplied sufficient electricity to light 360 16-candle-power lamps, or the equivalent of lighting 100 rooms.

### Energy - History (3)

The growth of the city over the next 11 years taxed the capacity of the facility, and, in 1906, a second east-side plant was built. Generating power for 4,800 16-candle-power lamps, it too was soon inadequate. Demand sparked by invention of the electric motor soon exceeded the supply.

A plant begun on the west side of Link River by the Moore brothers in 1907 produced approximately three times the wattage of the second east-side plant and within a short period of time was supplying electricity to such outlying areas as Merrill and Bonanza.

Ownership of the electric companies changed in the next decade. The Moores bought the Klamath Falls Light & Water Company in 1910, and sold it to the Siskiyou Electric Power and Light Co. in 1911. This company became the California-Oregon Power Company (COPCO) in 1912. It bought the eight-year-old rival Keno Power Company in 1927. No more changes occurred until 1961 when COPCO merged with Pacific Power & Light Company and PP&L now serves the Basin.

During these years, the electric service grew, supplying electricity to the nearby Pelican City (1916), Algoma (1921), and to Sprague River, Langell Valley, Bly and Beatty in 1929-31.

COPCO, with U. S. Bureau of Reclamation's approval, built a dam on the Link River, and built the necessary dikes and structures to regulate the waters of Upper Klamath Lake, finishing the project in October, 1921. It also completed its big Keno project on the Klamath River between Keno and the COPCO plant in California in 1958, and later renamed it the John C. Boyle Hydroelectric Project.

Even with these developments, the Basin demands grew faster than the local supply so outside power was needed. In 1953, a 230 Kv line from Klamath to Yamsey connected the Basin to the Bonneville Power network. Later, in the mid-1960's, a transmission tie from the Northwest Power Pool to California had a connection at Malin, bringing in an additional 500 Kv to the area.

By the end of the 1960's, a Pacific Northwest Joint Power Planning Council (now the Pacific Northwest Utilities Conference Committee) was formed. It united over 100 electrical systems and Federal agencies, including PP&L, to coordinate a 20-year plan for the development of new power facilities adequate to supply the Pacific Northwest.

## Energy - History (4)

Fuels

Wood. The fuel first used in the Basin was wood. It became a commercial product as the lumber industry developed in the area. These early mills had no way to dispose of the slabs and edgings that were produced so local wood distributors collected the waste slabs or blocks and delivered them to homes as fuel. In the early days the mills had no burners and stopped operating when scrap containers overflowed. At one time, production was so great that Klamath Falls exported wood for fuel as far away as San Jose. The Basin burned some 20,000 cords per year. Advancing technology eventually allowed the mills to utilize more and more of their own waste products, decreasing the supply of wood to the local markets. At the same time, new methods of heat for cooking and heating were becoming popular so the demand for wood dropped along with the supply.

Coal. One of the first fuels imported into the Basin was coal, the first shipment arriving by railroad car from Utah in 1913. Local dealers stored coal and delivered it to the Klamath residents. Coal was a major source of domestic heat, probably second only to wood for many years. Shipments went directly to some of the large users, such as the military base, because the local coal yard had storage space for only 3,000 tons. The Second World War made supplies difficult to get and coal was used from Montana, Wyoming, and Utah; and some was even shipped to the Basin from the Coos Bay mines on the Oregon coast.

Oil. The history of oil begins at about the same time as coal, the first shipment arriving in Klamath in 1914. It was not refined to the extent it would be later and was referred to as "black oil" and generally was burned in a "Ray Burner". The larger institutions, such as schools, hospitals and industrial buildings, were the first to use oil heat. Later, as technology provided a better product (diesel oil became available in 1928), having an oil burner in a home instead of a wood stove became somewhat of a status symbol. Both diesel oil and stove oil were shipped in tank cars, the latter being used by many of the farmers to run equipment. By the 1940's, six or seven tank cars of oil arrived in

## Economy - History (5)

the Basin each day; some storage was available, one tank system holding 250,000 gallons. As the economic levels rose after the war, more oil was used, as was electricity to heat homes.

Gas. In 1911, a City franchise was granted to allow "the manufacturing, sale and distribution of bottled gas for fuel, illumination and heating purposes." Records do not show the extent of production. In 1929-30 a plant to produce butane (and later propane) was constructed and lines were laid within the city for its distribution. The gas was used primarily in homes because its cost was too high then for commercial use. Later, a few local industries did convert and use this convenient fuel, but the supply was conditional: if the gas was needed elsewhere, the large user had to revert to standby bottled gas.

In the early 1960's Klamath Falls was able to connect to a large natural gas line running between Canada and California. This main distribution line passed some 14 miles east of the city and a lateral line laid under Lost River tapped the main line to a substation in the Moyina Heights area. Lines run to the downtown section and to the south suburbs brought the natural gas to the existing system. Since then, the lines have been extended and service is available in most, if not all, of the entire urban area.

## Energy - Current Conditions (1)

Geothermal

Along the fault block that forms the eastern edge of Klamath Falls, heat from the interior of the earth is close enough to the surface to be used by man. This is referred to as a "Known Geothermal Resource Area". It is believed that two main geothermal reservoirs exist: a lower region with temperatures above 250°F (121°C); and an upper level accepting heat in the form of steam and hot gases moving upward from the lower level via fault zones. Groundwater seepage into this upper reservoir tends to lower its temperature. The horizontal hot water flows appear to be in layers through the more porous materials from two to twenty feet in thickness, with impervious layers between.

Hundreds of warm wells scattered throughout the area have water temperatures that range from just above normal for the region (60°F, 15°C) to about 104°F (40°C). Most of the wells with temperatures greater than 140°F (60°C) are confined to the Klamath Falls urban area. Wells and springs with temperatures greater than about 150°F (65°C) are located not farther than about one mile (1.5 km) from the major fault zones. It is estimated that the amount of heat stored in the Klamath Falls geothermal system down to a depth of three kilometers is  $1.2 \times 10^{17}$  BTU's (an amount equal to the heat derived from burning 21.5 billion barrels of oil). This estimated heat content places the Klamath Falls system among the five largest known geothermal systems in the United States, excluding the Gulf Coast geopressed areas.

The amount of geothermal energy that is currently utilized in Klamath Falls is estimated as follows:

1 municipal swimming pool @ $3 \times 10^8$ BTU/year	=	$3 \times 10^8$ BTU/year
1 hospital @ $130 \times 10^8$ BTU/year	=	$130 \times 10^8$ BTU/year
3 churches @ $12 \times 10^8$ BTY/year*	=	$37 \times 10^8$ BTU/year
8 commercial establishments	=	$200 \times 10^8$ BTU/year
11 apartments @ $9 \times 10^8$ BTU/year*	=	$100 \times 10^8$ BTU/year
7 schools @ $29 \times 10^8$ BTU/year*	=	$200 \times 10^8$ BTU/year
1 college (O. I. T.) @ $250 \times 10^8$ BTU/year	=	$250 \times 10^8$ BTU/year
Approximately 500 residents @ $1.75 \times 10^8$ BTU/year*	=	<u><math>875 \times 10^8</math> BTU/year</u>
Over 500 sites using more than 400 wells	=	$1,795 \times 10^8$ BTU/year

\*Approximate average

## Energy - Current Conditions (2)

These figures indicate average consumption of geothermal energy; peak use could equal from eight to ten times this amount.

In the past three years, 29 new wells have been dug within the city, primarily for residential use. However, the cost of hot water well operation in Klamath Falls appears to be somewhat expensive for an individual homeowner. Initial investment of from \$7,000 to \$10,000 appears to be usual at the present time. Alternatives that could be considered are a minimum of four homes sharing a well, an entire block sharing a well, or an entire subdivision sharing a well. The greater the number of homes on one well, the larger and deeper the well will probably have to be and the greater the overhead cost for maintenance and administration will be. Four homes to a well appear to be near optimum for cost and efficiency when using down-hole heat exchangers.

The City is investigating the feasibility of using geothermal heat commercially, i.e., using a system to heat an entire district: domestic, commercial, or industrial. The direct use of geothermal heat for space and process heating has proven to be economical and reliable over the past 70 years. The potential for geothermal heat to produce electricity at this time is unknown. Temperatures above 350°F are necessary for producing electricity and their presence in the Klamath Falls area has not been substantiated.

## Solar Energy

The harnessing of solar radiation to provide an alternative energy source for man is a relatively new technology. Here in the Klamath Basin, its utility is just beginning to be considered, although the energy source is certainly available. Records over the past few years show the following averages for the months of the year in amounts of solar energy available:



## Energy - Current Conditions (3)

Month	BTU's/sq. ft./day
January	557
February	849
March	1,255
April	1,775
May	2,129
June	2,185
July	2,273
August	1,996
September	1,601
October	1,063
November	590
December	461

Several homes in the Basin have installed solar heating systems. Unfortunately, some systems that worked very well in Arizona were put in homes in the Klamath Basin, with its colder ambient air temperatures and lower solar radiation levels. Analysis of the efficiency of solar collectors shows that efficiency drops with lower ambient air temperatures and the Arizona style systems proved insufficient for use in the Basin. Larger, more efficient units are now available and are being used in new homes; in Klamath County, even on a non-sunny day in winter, a good solar heating system can supply half the heat needed in a home during daylight hours.

The initial cost of solar heating is high, currently about \$30 per square foot of collector area. Also, a solar heater requires a forced air system to circulate the heated air throughout the house. For those cloudy days, a backup system, either electrical, gas or oil, is needed.

### Electrical Energy

A recent survey in the Klamath Falls urban area showed that 100 percent of those questioned used electricity to some extent in their homes or businesses. Data from Pacific Power & Light Company shows the following (April, 1978):

Type of Service	Within City	Outside City	Total Urban Use
Residential	6,380	14,360	20,740
Commercial	1,342	4,874	6,216

## Energy - Current Conditions (4)

These numbers are increasing daily; the number of new hookups in 1977 included 426 new homes, 70 multiple dwelling units, and 245 mobile homes in the area.

Power is generated locally by two power plants on Link River and one on Klamath River. The Link River East Side Plant has a capacity of 3 megawatts, while the West Side Plant produces 600 kilowatts. The John C. Boyle Powerhouse can generate 82 megawatts. Thus the total capacity of the area is 85.6 MW of power, dependent, of course, on available water supplies. (The Klamath River supports five projects with a total generation rating of 162.5 MW.)

Peak demands for electricity in the area reach 130 MW on occasion so local supply is insufficient. Klamath Falls is connected with a 500,000-volt transmission tie from the Northwest Power Pool and this transmission tie will be further reinforced by major 500,000-volt lines from Malin to Idaho and Medford with construction now awaiting the approval of State and Federal authorities.

Conservation efforts are being expanded in an attempt to lower per capita usage; such things as storm windows, additional insulation and lower thermostats are being promoted. Even with such practices, the increase in population projected for this area will increase the total electrical requirements.

## Fuels

Wood. Because of the rising costs of electricity, coal, oil, and natural gas, the use of wood as a fuel is increasing. In addition to up-to-date fireplaces with heat circulators, several varieties of modern and efficient woodburning stoves can be purchased locally, and are being used.

Wood is readily available within a few miles of the urban area to those who wish to cut and haul it. Several enterprising individuals or groups also provide cut wood by the cord -- prices begin at \$20, depending on the type of wood and how it is cut. Some scrap wood is also available from local mills, but this supply is limited as the mills utilize most of their waste wood.

Coal. Except for Kingsley Field, not many users in the Klamath Falls urban area burn coal anymore. There is only one distributor and his volume

## Energy - Current Conditions (5)

is limited. A recent survey showed coal to be the source of energy for less than one percent of the urban area.

Oil. Oil is still in use as a heating fuel, although it is less popular than it once was. There are several distributors in the area, so statistics on volumes used are difficult to obtain. It is estimated that 10 percent of the homes in the urban area use oil for heat.

Gas. Next to electricity, natural gas is the second most used form of energy in the Basin. It is available for cooking and heating as well as for industrial uses, and it is estimated that it provides about one third of the energy for the area. At the beginning of 1977, nearly 5,000 residences, over 660 commercial businesses, and a few industries used natural gas in the Klamath Falls area.

Energy - Problems (1)

- Average wind speeds (5.1 mph) within the Klamath Falls urban area are not sufficient for electrical generation.
- The incineration of solid wastes is not financially feasible within the scope of the existing County-managed program.
- Klamath Falls will continue to be a net energy importer in the foreseeable future, particularly of high-cost electricity and natural gas.
- The rising costs of available energy increase home and business expenses.
- The private versus public use of area's geothermal resource may be in conflict at times.
- The high use of wood or fossil fuels contributes to air quality problems.
- Less than one percent of the urban area energy is derived from the most abundant fossil fuel energy source -- coal.

D E T A I L E D   A S S E S S M E N T   N O T E

SUB-ELEMENT:    ENERGY

THE CONTENT OF THIS SUB-ELEMENT IS SUPPLEMENTED BY THE FOLLOWING DETAILED ASSESSMENT WHICH WILL BE ADOPTED BY REFERENCE WITH THE COMPREHENSIVE PLAN.

OREGON INSTITUTE OF TECHNOLOGY/  
LAWRENCE LIVERMORE HOT WELL STUDY

COPIES OF THIS ASSESSMENT MAY BE AVAILABLE FROM THE ORIGINATING AGENCY OR CAN BE INSPECTED AT THE CITY PLANNING DEPARTMENT OFFICES.

### Energy - Future Alternatives (1)

- On a national basis, energy demands are doubling every 14 years.
- By 1980, general energy costs will rise from 34 to 59 percent over 1975 levels.
- The national dependency on electrical energy will increase from a 1970 level of 25 percent of total energy consumption to 50 percent in the year 2000.
- By 1980, there will exist a shortage of electricity, with no shortages of petroleum, natural gas, or coal.
- Nuclear energy will provide 25 percent of the national needs by 2000.
- The proposed geothermal heating district could become infeasible due to a change in water supply or earthquake impact.
- A decrease in available fossil fuels can lead to economic problems within the area relative to transportation, agriculture, and heating.
- Geothermal, solar, coal and other alternative energy sources will become economically more feasible.
- Growing electrical demands will require additional transmission to Pacific Power & Light's existing 230 kv substation; this may require either an additional 500/230 kv transformer at Malin in 1982 and an additional 230 kv Malin-Klamath Falls line in 1984, or a new 500/230 kv transformer at or near the above mentioned Klamath Falls substation.

**Energy - Goals (1)**

- To conserve energy and promote the utilization of alternative energy sources.

### Energy - Policies (1)

- The prudent use of alternative energy devices (solar, geothermal et cetera) should be encouraged through provision of tax incentives.
- Energy efficiency should be a principal criterion in evaluation of all transportation facilities -- both public and private.
- Energy-efficient residential densities will be promoted relative to work sites and transportation planning.
- Urban sprawl will be curtailed and in-filling of vacant land promoted to reduce energy costs.
- Energy-consuming vehicular trips should be discouraged and the development of mass transportation within the city promoted.
- Recreation-related energy consumption should be reduced in view of less energy-consuming recreation activities (in the urban area itself).
- In an effort to lessen the energy expenditures for service provision, the utilization of the maximum usable building area on each lot should be encouraged, thereby resulting in an energy-efficient building configuration with minimum street frontage.
- Pedestrian and bicycle use should be promoted as alternative modes of transportation.
- The recycling of solid waste materials for both energy and reclamation purposes will be promoted.
- Building access to solar rays will be protected to provide for lower heating costs.
- The carrying capacity of the Known Geothermal Resource Area must be defined and then not exceeded.
- Geothermal space heat should be available to the largest number of residences and businesses possible.



Energy - Policies (2)

- Moving or flashing outdoor advertising signs and other non-essential energy utilizing activities will be discouraged.

### Energy - Implementation Measures (1)

- All City construction projects should provide leadership in demonstrating energy conservation.
- Public education relative to energy conservation and the attendant savings to the consumer should be promoted.
- The use of heat pumps should be promoted in lieu of electrical resistance heating.
- The City will apply for grants to develop special heating or other energy-saving measures.
- A detailed carrying capacity analysis of the Known Geothermal Resource Area will be developed and the uses of the geothermal heating district will be promoted.
- A recycling center for the area should be developed, including the provision of adequate funding where necessary.
- The use of solar energy as an adjunct energy source will be encouraged through the protection of solar exposure, flexible setbacks and height requirements, and the promotion of a building code which allows for innovative design.
- Projects such as centralized parking areas, downtown shopping malls, and public transportation will be promoted as a means of reducing short vehicular trips within the urban area.

M A P N O T E

SUB-ELEMENT: ENERGY

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP DEPICTING THE FOLLOWING ITEMS:

ELECTRICAL

NATURAL GAS

GEOTHERMAL RESIDENTIAL AREA

THIS MAP CURRENTLY EXISTS IN ROUGH DRAFT ONLY, AND IS NOT AVAILABLE FOR REPRODUCTION. HOWEVER, DRAFT COPIES ARE AVAILABLE FOR INSPECTION AT THE CITY PLANNING DEPARTMENT OFFICE.

## HOUSING SUB-ELEMENT

## Housing - History (1)

The first permanent structure built within what is now the City of Klamath Falls was the wooden cabin constructed by George Nurse when he first arrived. It was built from sawed lumber rafted down the lake from the Fort Klamath mill. The proximity of this mill and the easy transportation by water provided adequate access to building materials. The addition of two more mills to the area within a few years improved the situation. Log housing, found so often in the pioneer settlements, never proliferated here. Instead, early structures were constructed of hewed timbers and rough planking, often with small boards covering the open cracks. As planed lumber became available, a form called "lap board" became popular and such buildings as the old courthouse (1888) and the first city hall were constructed in this manner.

Mineral resources of the area also provided building materials. One of Nurse's early buildings was supplemented with brick purportedly made in the downtown area. Stone was also used a great deal, especially in the more expensive structures. Well known was the one stone building on Payne Alley which was built in the mid-1880's and survived the fire of 1889. The quarry east of town supplied the stone, which, it was claimed, was soft when cut and hardened with age. In any event, over the years a large amount of the stone was used for construction in the Basin and it proved a very durable building material.

Architectural styles of from 50 to 75 years ago can still be seen in some of the older houses in Klamath Falls. Perhaps the most well-known example of the Victorian form is the ornate Goeller home overlooking Lake Ewauna. It was begun shortly after 1900 but was not occupied until 1905, and finishing touches were added later. Cupolas were popular and appeared on several buildings, such as the Lakeside Inn, and dormers were a favorite second story appurtenance. Most of the residential homes dating back to the early days of the city were either built by the owners or custom built; the latter usually being costly, but of varied and interesting architecture. As land developers prospered, tract-type housing began appearing, especially in the lower price ranges. The first model home in the City was opened in the Hot Springs area and is still in use as a residence.

## Housing - History (2)

Electrical service was available to homes by the turn of the century, as was water distribution. The sewer districts were formed soon after, so lighting and plumbing were accessible to those who lived in town. By the end of 1907, the City required building permits within the City limits, and it hired a sewer inspector in 1910. Specific areas such as electrical wiring and plumbing did not require technical inspection until 1948 and 1952 respectively, at which times the offices of an Electrical Inspector and a Plumbing Inspector were created.

In the early years of the City, a number of the residents lived in boarding houses such as the "Huston Hotel". No specific numbers of boarding houses are available, but several old manuscripts refer to them. By 1925, some 35 hotels existed in Klamath to house the flood of construction, railroad and mill workers.

The 1920's were a period of rapid growth for this area and Klamath County rated the honor of having the most new home constructions in the state in 1924. Two years later the City adopted a building code and by 1930 developed its first zoning ordinances.

Two housing-related organizations that have recently come into being are the Klamath Basin Home Builders Association in 1969 and the Housing Authority. This latter bureau was authorized under the Federal National Housing Act of 1937, but was not available in Klamath Falls until 1970. Its purpose is to aid low-income families and senior citizens in obtaining adequate housing. One project that is completed is the Kingwood Apartments for senior citizens, built in the mid-1970's.

Housing starts over the years between 1960 and 1977 have risen sharply, and multiple housing has also risen extensively; this can be seen from the following chart which enumerates construction within city limits only.

## Housing - History (3)

Year	New Construction				
	Single Dwellings	Total Valuations	Average /Unit	Multiple Dwellings	Total Valuations
1960	23	\$ 305,639	\$13,288	2	\$ 181,000
1961	23	341,554	14,850		
1962	28	443,560	15,841		
1963	28	461,440	16,478		
1964	28	420,000	15,000	2	41,000
1965	16	281,300	17,581	5	264,000
1966	16	262,900	16,431	4	74,888
1967	22	477,141	21,688	6	118,305
1968	24	553,279	23,053	2	131,440
1969	30	548,716	18,290	7	810,281
1970	20	413,196	20,660	2	44,028
1971	11	228,980	20,816	3	97,825
1972	21	433,881	20,661	2	52,819
1973	19	436,478	22,972	7	304,674
1974	33	831,306	25,188	24	770,400
1975	76	2,310,788	30,405	12	1,791,205
1976	105	3,010,337	28,669	39	1,787,682
1977	169	5,418,672	32,063	27	2,584,764

Census figures show the total housing units for the County rising 13.4 percent from 1940-50, 13.9 percent from 1950-60, and only 8.1 percent between 1960 and 1970. In 1950, 41.5 percent of the dwellings were rented units; in 1960 this had dropped to 37.5 percent and the trend continued with only 37 percent of the County's housing occupied by renters in 1970. Total housing units within the City have risen from 5,292 in 1940 to 6,307 in 1970, a drop from the high of 6,803 in 1960. The ratio of rentals to owner-occupied was higher in the City than in the County, equaling 48 percent in 1940, 47.5 percent in 1950 and rising to 49 percent in 1970. Of all the owner-occupied households in the County, 10.4 percent were below poverty level in 1969, and over 19 percent of the renter households fell below the poverty level, giving an overall average of 14.1 percent.

## Housing - History (4)

The following housing report made for the County in 1976 gives an accurate picture of the housing situation in the area during the early 1970's.

During the 1970-73 period the local real estate market underwent a boom as the surge in population put increasing pressure on an already inadequate stock of family housing, much of it of sub-standard quality. In 1970 the median number of rooms per dwelling in Klamath County was 4.6 compared with 5.0 for the State as a whole. Persons per unit was 2.5 compared with 2.4 statewide. Median value was \$12,700 compared with \$15,400; 6.1% of housing units lack some or all plumbing, compared with 3.5% statewide. While construction of single unit family housing has proceeded at an accelerated pace, particularly in the suburban area around Klamath Falls, that of rental housing appears to be lagging. In 1970 the vacancy rate was 7.5%, compared with a State average of 7%, while the median rent was \$69 compared with a statewide median of \$87. The rental picture is complicated by numbers of married students attending Oregon Institute of Technology and personnel assigned to Kingsley AFB. The recent reduction-in-force at the base resulted in the vacation of in excess of one hundred units of rental housing. Following a period of adjustment, a shortage again exists. It is not primarily quantity but quality that is in short supply. The low median rent is indicative of the quality available, much of which consists of substandard single family dwellings vacated by homeowners who have purchased better homes. These units remain on the market and are not demolished due to the lack of adequate low and median income rental housing.

SOURCE: Oregon Employment Division.

## Housing - Current Conditions (1)

When compared to other cities or to the State as a whole, Klamath Falls can be characterized as having both a unique and a serious housing situation. The following table compares several parameters of the housing situation for Klamath Falls, the 18 eastern Oregon counties, the State of Oregon and the United States.

	Comparative Housing Status			
	<u>Klamath Falls</u>	<u>Eastern Oregon</u>	<u>State of Oregon</u>	<u>United States</u>
Percentage single housing units	70.3	79.7	75.7	66.2
Percentage meeting requirements for standard housing as set by U. S. Bureau of Census	96.6	95.3	96.4	93.4
Median household size (persons)	2.6	2.5	2.4	2.7
Percentage of households comprised of only one person	24.0	18.0	19.2	17.6
Percentage of households comprised of six or more persons	5.5	9.1	8.5	10.4

The 1970 census data indicate that for Klamath Falls 43 percent of all housing units (6,304 total) were 30 years old or older, eight percent of all housing units were overcrowded and 5.8 percent of all the units lacked some plumbing facilities. Nearly half of all occupied structures were rentals (49.5 percent), and 42 percent of these rental units were considered cost-excessive for the renter, i.e., more than 25 percent of their gross income went for rent. In this group, 89.3 percent had gross incomes of less than \$5,000 per year. The vacancy rate for single units was 1.7 percent and that of multiple units was 7.7 percent, indicating a lack of available housing.

This lack of living quarters has led to an increase in construction, with 736 housing units being constructed between January 1970 and April 1978, or an 11.7 percent increase in the number of units. According to the Department of Housing and Urban Development, the overall occupancy rate was still at 99.08 percent by the end of 1976. At that time, there was an average rental range of from \$130 to \$240 per month.



## Housing - Current Conditions (2)

Other detailed statistics on the housing in Klamath Falls show that, as of May 1978, there were 7,068 housing units within the City; 66.7 percent of them single housing units, 6.1 percent duplexes, 0.5 percent triplexes, 1.9 percent fourplexes and 24.8 percent with five or more units. The overall conditions rating of these structures shows that 49.0 percent are not defective, 30.7 percent show slight defects, 16.9 percent have intermediate defects and 3.4 percent are critically defective.

The City Planning Department conducted two surveys in 1977. Of the people responding, 62 percent owned their own housing, 36 percent were renters and two percent gave no response. The people stated the following concerns.

Condition of Housing. Twenty-three percent felt their housing would be classed as excellent, 56 percent as good, 17 percent as fair and three percent as poor. Sixty-six percent of the people said there were not adequate numbers of affordable housing units in the City. Addressing this concern, 58 percent felt that more single family units should be constructed, and 20 percent felt more apartments should be constructed; 56 percent favored rehabilitation of old structures rather than new constructions.

Housing thus appears as a serious problem in the community and has a direct effect on the economic future of the area. According to Klamath Multiple Listing Association, in 1977, the real estate agencies had a total of 1,162 sale closures, amounting to a residential sales volume of \$34,838,620 or an average sale of \$29,981. Klamath First Federal Savings and Loan Association data gives the average sale of residential property within the City limits as \$29,700 versus an average of \$32,800 for the suburban area. The total unit construction in the City for the first four months of 1978 shows 51 single units, seven duplexes and one apartment with a total valuation of \$2,818,664.00.

Probably most affected by the inadequate housing are the low-income families, the single head-of-household families and the senior citizens. The Klamath Housing Authority during its eight-year tenure here has assisted 294 families under its programs. One hundred ninety-eight families are receiving assistance at the present time under the HUD

### Housing - Current Conditions (3)

Section 8 program. This assistance helps low-income families, most having children, pay their rent; also a small number of elderly are currently receiving assistance. The major senior citizen program is the 80-unit Kingswood Apartments; however, these units are full to capacity and a waiting list for vacancies exists.

For future developments, the Klamath Housing Authority has applied for 65 units of public housing for low- to moderate-income families. These units will consist of two-, three-, and four-bedroom homes, 10 of which will be located in Lake County and the remainder in Klamath County. The Klamath Housing Authority director stated in 1975 that there was a need for 500 more senior citizen housing units and a need for 500 multiple family units. Of these units, 250 should be designated for low-income senior citizens and 250 should be for the general low-income families.

Any construction done within the City must meet certain standards to be acceptable. The criteria for the quality of buildings in Klamath Falls was established by an ordinance adopting the "Uniform Building Code". This code was developed to provide minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location and maintenance of all buildings, structures and certain equipment within the City limits.

The Code provides for buildings and structures to be classified by fire zone, occupancy group (kinds of uses), types of construction, location on property, floor area, height and number of stories and capacity or occupant load. In addition, verification of compliance in construction, renovation, remodeling or repair is handled by the Uniform Building Code and enforced by the City Building Inspector and the Health and Safety Officer.

## Housing - Problems (1)

- There exists an increasing number of absentee landlords.
- Sources of local building materials are limited.
- New residential development in the city is limited due to a lack of suitable vacant lands.
- The available housing stock within the city is generally older than that of the suburban area.
- A substantial portion of the City's residents cannot afford to buy new housing.
- Increased government regulations can add to housing costs.
- House maintenance costs are increasing.
- The housing needs of the low-income and the elderly are greater than existing supplies of such required units.
- Developers prefer large open tracts of land for new housing, thereby passing over scattered, individual vacant lots which already contain full services.
- Large multiple housing units are either in poor condition or not available to low- or middle-income persons.
- There exists a lack of incentive to rehabilitate and maintain or utilize older buildings.
- Rising property taxes reduce the number of available homeowners and raise the costs of housing.
- The planning process has failed to provide sufficient multiple dwelling housing development potential.
- The high costs of building permits, fees and taxes on home improvements increase housing costs.
- In 1970 over 70 percent of all renter households in Klamath Falls were paying more than 25 percent of their gross incomes for rent,

## Housing - Problems (2)

and about 90 percent of such households had gross incomes of less than \$5,000 per year.

- Approximately 14 percent of the year-round housing in Klamath Falls is substandard.
- Current zoning and development ordinances add substantially to basic housing costs.
- To meet the projected needs of the population, residential development of various types, built at various densities, will be required.
- There is an acute shortage of apartments or other multi-family dwelling units which provide for the proper use of space relative to privacy and outdoor living areas.

D E T A I L E D   A S S E S S M E N T   N O T E

SUB-ELEMENT:    HOUSING

THE CONTENT OF THIS SUB-ELEMENT IS SUPPLEMENTED BY THE FOLLOWING DETAILED ASSESSMENT WHICH WILL BE ADOPTED BY REFERENCE WITH THE COMPREHENSIVE PLAN.

U. S. BUREAU OF CENSUS 1970 KLAMATH  
FALLS CENSUS

COPIES OF THIS ASSESSMENT MAY BE AVAILABLE FROM THE ORIGINATING AGENCY OR CAN BE INSPECTED AT THE CITY PLANNING DEPARTMENT OFFICES.

### Housing - Future Alternatives (1)

- Construction costs will continue to increase and outstrip ability of most people to buy or rent.
- New technologies will change the design and functions of homes, this serving to minimize the costs of construction.
- Densities will increase and serve to save costs relative to energy consumption, travel, public facilities and services, et cetera.
- The demand for adequate housing serving the low-income and elderly will increase.
- Federal and State housing programs frequently alter proposed housing production due to changes in funding or emphasis.
- The reliance on mobile home units as a means of meeting housing demands will increase.
- Housing densities will increase due to a demand for low cost housing.
- An increased number of low-income people will be relying on homeowner or rental assistance programs, thereby reducing the assistance available.
- New housing assistance programs will be set up under the authority of the Federal Housing and Community Development Act of 1974.

Housing - Goals (1)

- To provide for the housing needs of the citizens of Klamath Falls.

## Housing - Policies (1)

- The interrelationship with transportation, job sites, shopping sites, recreation, open space and scenery, education, and similar activities should be emphasized to provide maximum and efficient use of public facilities and service.
- Housing projects should serve a variety of ages, incomes, occupations, and interests while maintaining individuality in design and aesthetic concern.
- Increased densities should be promoted to reduce energy consumption, facility and service costs, and urban sprawl.
- A maximum priority should be given to maintaining and rehabilitating, where possible, existing housing units.
- State legislation that allows private developers to provide housing at low prices will be supported.
- Efforts to remove tax assessment penalties from home improvement, particularly regular maintenance activities, will be supported.
- Special emphasis will be given to the monitoring of the needs of the low-income population.
- Programs and incentives will be developed to provide for better management and maintenance practices relative to rental housing.
- The question of allowing single mobile homes will be studied and appropriate actions taken based on the results of such studies.
- The City will continue to identify critically substandard housing and seek appropriate removal actions, but only when occupants, if any, can be assured of substitute accommodations.
- Housing for the elderly, including low maintenance smaller units, will be promoted.



## Housing - Policies (2)

- Housing styles for single adults or childless couples will be supported.
- Mobile home parks, as alternative housing choices, will be promoted, while minimizing the adverse impacts on adjacent properties through appropriate site location and design criteria.
- Excessive concentrations of low-income housing should be avoided.
- The development of smaller, isolated vacant lands already available within the City limits will be encouraged.
- The construction of multi-family, low-income housing throughout the city will be supported.
- The City should meet future housing needs in the planning area by encouraging the development of economic dwelling units which produce diverse residential environments and increase housing choice.
- The City shall review and carefully consider the immediate and long-term effects of fees, charges, regulations and standards on dwelling costs.
- The City will encourage the use of innovative site development techniques and the mix of dwelling types in all undeveloped residential areas.
- The City should preserve and encourage a mix of household and densities use.
- The continued residential use of existing high-quality residences will be encouraged within the downtown area.
- The City will identify housing needs within the community to assist O. I. T. and the housing industry in coordinating provision of adequate student housing.
- The City should encourage the use of high-density residential development compatible with the area in which it is located to provide for student housing close to the O. I. T. campus.

### Housing - Implementation Measures (1)

- The City should provide avenues for public education and involvement.
- Zoning should permit maximum flexibility of type and density (condominiums, row houses, et cetera).
- The City should support and cooperate with Klamath Housing Authority, Home Builders Association, Board of Realtors, to provide a balance of housing offerings and choices.
- A buildable lands inventory and housing condition tally should be maintained to show actual areas of needs and developments.
- The City should apply for grants to provide low income housing for senior citizens and other needy people.

M A P N O T E

SUB-ELEMENT: HOUSING

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP  
DEPICTING THE FOLLOWING ITEM:

STRUCTURAL CONDITIONS

THIS MAP CURRENTLY EXISTS IN ROUGH DRAFT ONLY, AND IS  
NOT AVAILABLE FOR REPRODUCTION. HOWEVER, DRAFT COPIES  
ARE AVAILABLE FOR INSPECTION AT THE CITY PLANNING  
DEPARTMENT OFFICE.





PUBLIC FACILITIES AND SERVICES ELEMENT

INCLUDING THE FOLLOWING SUB-ELEMENTS:

EDUCATION

RECREATION

TRANSPORTATION

WATER SERVICE

SEWER SERVICE

SOLID WASTE DISPOSAL

STORM DRAINAGE

SAFETY AND HEALTH

COMMUNICATIONS



## E D U C A T I O N   S U B - E L E M E N T

## Education - History (1)

Education, in the early days of Linkville, was haphazard. State regulations required that classes must be held for three months before a school district could be formed, so in 1870 the local citizens rented a room over Robert's Store at Payne Alley and Main Street, and hired a Mr. Nail as teacher. He instructed the students for the required three months. On July 1, 1871, the Linkville School District was formed. This district became School District #1 when Linkville became county seat for Lake County and remained so when Klamath County was formed.

The very early records of the district no longer exist so the date of building the first official school house is unknown. In either 1876 or 1878, a one-room board building, 12 feet by 16 feet, was built to serve as a school. It was small and crowded and water had to be carried from the spring near Seventh Street and Klamath Avenue. The school's exact location is not known, but in Nurse's original town platting, Block 12 was dedicated to "common school purposes". In 1880, by a deed of exchange, Block 13 became school property and Block 12 was returned to Nurse. Conveniently the school was built on the wrong lot by mistake, necessitating the change. Block 13 lies between Pine and Main Streets and Ninth and Tenth Streets. In 1886 a new school, a two-story, two-room wooden building was constructed on Block 13 for \$1,500.

Even though a school superintendent was elected in 1882, the public school system was not completely satisfactory to all of the populace and over the years several small private schools flourished. "Academy Hall" was one such and occupied the upstairs of the drug store in 1886. Dissatisfaction with the system was so great that in 1891 no school tax was approved and no classes were held that fall. By the following year, two more rooms were added and the school reopened; this structure remained in use until after the turn of the century.

In 1903, Klamath County High School was officially formed and a principal was hired. However, construction of the school building, located on High Street between Fifth and Sixth Streets, was not completed until 1906. For the intervening years the classes met in the town hall.

Central School, a stone structure built for \$29,500 in 1905, replaced the old four-room school and Ninth and Main Streets, and served the children



### Education - History (2)

until it was demolished in 1925. A second elementary school, West Side School (later Riverside), opened Thanksgiving 1910. It became the first school in Klamath to have a cafeteria and in 1919 served hot lunches for 9¢ and 11¢. Prior to 1912 a three-seat spring wagon carried pupils to Riverside from the north end of town -- probably the Basin's first school bus.

The original Mills School was built in 1911. It was replaced in 1919 by the present building; 11 classrooms and a gymnasium were added between 1926 and 1929, and the current auditorium was constructed in 1949. It was the parents of the Mills district who established the first P. T. A. organization in the city in 1924.

Pelican Bay Lumber Company donated lumber for a two-room building near Lakeport Boulevard in 1912. It apparently was used as Pelican School for a decade, and, having been moved to another location, is now the Merry Mixers Square Dance Hall. Blocks 3 and 4 of Klamath Lake Addition were purchased in 1921 and a school building valued at \$31,780 was completed there in 1922.

In 1926, the Klamath Falls City School District became a separate entity. During the decade of the 1920's, Fairview, Fremont, Conger, and Roosevelt Schools were built, and only Fremont no longer serves the city. Klamath Union High School was constructed at its present location in 1928. Ponderosa was built as a starter unit in 1956 and completed as a seventh and eighth grade junior high school in 1971. Lucille O'Neill School was built in 1961, and Mazama Mid-High (ninth and tenth grades) was completed in 1965.

Educational levels are not available from early records, but the 1950 statistics show that the average number of years the County's adult population (over 25 years of age) had attended school was 11.7 years, while in 1960 it had risen to 11.8 years and 48.4 percent had completed high school.

### Kindergartens

It has only been over the past few years that public kindergarten has been available in Klamath Falls. In the early 1970's five elementary

### Education - History (3)

schools began offering kindergarten classes to all of the city school district's five- and six-year-olds. Various private preschools have been available in the urban area for quite a few years.

#### Private Education

Several private schools flourished in the early days of the city. They lost prominence as public education facilities improved. The most well-known and long-lived private institution was and is the Catholic academy, Sacred Heart. It began holding classes in the fall of 1917, moving into present accommodations in 1929. It has served the city as a parochial school for over 60 years.

The Seventh Day Adventist School was begun here sometime in the mid-1950's and moved into its current facilities in the mid-1960's. In 1975 the Assembly of God Church opened its private school in its present location in Klamath Falls.

Over the years there have been some small business colleges serving the city, the last one closing its doors about 1970 as O. I. T. increased its curriculum to include business and secretarial training.

#### Oregon Institute of Technology

During World War II the government constructed a recuperational and training center near Klamath Falls on Old Fort Road, commonly known as the Marine Barracks. In 1946 the War Assets Administration offered the facilities for sale, and in 1947 the center was sold to the State Board of Education.

On July 14, 1947, Oregon Vocational School opened its doors to Oregon veterans, offering classes in auto mechanics, auto body and fender repair, and commercial cooking. By the next April there were 500 students enrolled. In December 1948, the name was changed to Oregon Technical Institute. Originally founded under the State Board of Education, in 1960 O. T. I. came under the jurisdiction of the State Board of Higher Education, indicative of its status as a full-fledged college. In September 1964 the college was moved to its present location.

Oregon Tech, after its inception as a trade school, in 1951 began offering two-year technical programs and in 1958 associate degrees; by

#### Education - History (4)

1966 a bachelor of technology degree became available in specified fields, and a bachelor of science degree in 1978. Professional accreditation for some individual technologies began in 1953, and the school attained regional accreditation for two-year programs in 1962 and for four-year programs in 1967. To reflect its expanded function, the name of the school was changed to Oregon Institute of Technology in October of 1973.

#### Libraries

The Klamath County Library was constructed in 1913 and was located near the high school. It was replaced by the structure at Third Street and Klamath Avenue in 1954, and was extensively enlarged in 1974-75. The construction of a City library was approved by the voters in November, 1924, and a free public library was established in May, 1926. In its first five years of operation, circulation rose almost 600 percent from 13,000 to over 78,000 books per year. The two libraries, City and County, were consolidated in July, 1969, into a single County library which remains housed in the County Library Building.

## Education - Current Conditions (1)

The urban area of Klamath Falls is served by three school districts. School District #1 administers grades kindergarten through eighth within the City; it is coupled with School District UH #2 which handles mid-high and high school. Both districts are managed by one administration. Outside of the City is the County School District which serves the remainder of the urban area as well as the rest of the County.

There are ten schools in the City's two districts; data concerning them are shown below.

<u>School</u>	<u>Grades Served</u>	<u>Classroom Capacity</u>	<u>Current Enrollment</u>	<u>Percentage of Capacity</u>	<u>Acres of School Site</u>
Conger	K-6	260	222	85	4.80
Fairview	K-6	365	299	82	1.60
Mills	K-6	460	356	77	3.53
O'Neill	1-4	200	165	83	19.00
Pelican	K-6	250	205	82	5.20
Riverside	1-6	200	166	83	2.40
Roosevelt	K-6	360	346	96	4.02
Ponderosa	7-8	600	501	84	23.00
Junior High					
Mazama	9-10	1,225	1,180	96	49.50
Mid-High					
Klamath Union High School	11-12	1,200	881	73	15.00

O'Neill School, although providing regular classes for only grades one through four, is the facility for special education classes. These special classes are not reflected in the above data. Ponderosa is the only junior high school in the City system but Mazama Mid-High receives students from Brixner Junior High School, one of the County schools, and from Ponderosa; hence, Mazama has more than double the enrollment shown for Ponderosa. Kindergarteners in the Riverside area are enrolled in the Conger kindergarten class; those in the O'Neill district attend Mills.

There are ten County schools in the Klamath Falls urban area, seven elementary and two junior high schools, and one high school. Data concerning them are shown below.

## Education - Current Conditions (2)

<u>School</u>	<u>Grades Served</u>	<u>Classroom Capacity</u>	<u>Current Enrollment</u>	<u>Percentage of Capacity</u>	<u>Acres of School Site</u>
Altamont	1-6	350	337	96	20*
Fairhaven	1-8	275	277	101	11
Ferguson	1-6	525	512	98	14
Henley Elementary	1-6	300	287	96	**
Peterson	1-6	500	548	110	8
Shasta	1-6	550	523	95	11
Stearns	1-6	400	403	101	14
Brixner Junior High	7-8	600	458	76	22
Henley Junior High	7-8	450	488	108	**
Henley High	9-12	800	720	90	**

\*Two pieces

\*\*Three sites total 47 acres.

High school drop-out rates for the 1977-78 school year are 12.1 percent for Klamath Union and 5.3 percent for Henley. However, these are not directly comparable as Klamath Union is only a two-year high school while Henley is a four-year high school.

Our cultural pattern of increasing mobility is reflected in the transfer statistics of the local schools. During the 1976-77 school year, the 10 City schools showed totals of 919 transfers in and 844 transfers out; this is approximately 40 percent of the total student body either leaving, coming, or switching schools locally. A survey done at one school, Mills, showed that of the 90 children entering the first grade there in 1970, only three were still attending Mills in 1976; a withdrawal rate of 96 percent over six years; the class entering in 1971 showed a withdrawal rate of 87 percent over five years.

Both City and County schools make their institutions available for many community service activities. Most of the schools serve as voting places during elections; and as meeting places for such organizations as Scouts, Campfire, 4-H, and various neighborhood groups. Recreational activities using gymnasias and outdoor facilities are frequently scheduled as additional uses outside of normal school functions.

### Education - Current Conditions (3)

The total budget for the two City school districts for 1978-79 exceeded \$7.25 million. Approximately 40 percent of this goes for teaching salaries, the remainder covers a wide variety of costs ranging from administration to transportation.

For those who did not complete high school as scheduled there are two ways of doing so at a later date. Klamath Union offers high school courses for credit, designed specifically for adults who wish to earn sufficient credits to meet graduation requirements. These cover the areas of English, mathematics, social studies, science and health. A diploma is granted to those who earn the required number of credits.

The second alternative is the General Education Development, or G. E. D., examination. The person who passes this group of tests has the skill and abilities equal to those of a high school graduate. A certificate is issued by the State Board of Education to persons 18 years of age or older who successfully pass these tests. Klamath Union offers classes in preparation for this G. E. D. exam.

By 1970, the median number of school years completed by persons 25 years of age or older in Klamath County was 12.3 years. This was an increase of six months in education over the previous decade. Of these adults, 59.7 percent are high school graduates and nine percent are college graduates.

### Private Schools

There are three private schools in Klamath Falls, all with religious affiliation. Sacred Heart Academy provides both primary and secondary education for approximately 300 elementary and 150 high school students. The school is fully accredited, with about 40 percent lay teachers and 60 percent teaching nuns. It offers a full academic program and the curriculum is comparable to that of the public schools, but it is religiously oriented with the students offered 2.5 hours of religious training a week.

The Seventh Day Adventist School teaches grades one through eight and normally has from 30 to 35 students; the Assembly of God School, grades two through twelve, has about 60 students. Both teach standard curricula and are religion oriented.

#### Education - Current Conditions (4)

Eight State and/or Federally licensed day care centers, with a combined capacity of 268 children, are located in the urban area. Five private kindergartens operate within greater Klamath Falls.

#### Oregon Institute of Technology

Oregon Tech is the coeducational polytechnic college of the Oregon State System of Higher Education, and holds a position of national prominence in the field of technical education. Several programs are offered in each of the fields of business, engineering, industrial, and allied health technologies, and in a college transfer program. An associate degree is available in most programs after completion of a two-year course of study. A bachelor degree, either of science or technology (B. S. or B. T.) depending on the programs, is available in many of the curricula.

Programs at O. I. T. are technical in nature and are job oriented. A "hands on" experience is provided in the major interest fields. Instead of requiring two years of general education in the lower division and two years of specialization in a major field at the upper division level, O. I. T. puts the technological specialization in the first two years with diversification coming later. This unique structure is best described as a "two-plus-two" program rather than a four-year program. For those interested in specific fields not offered at O. I. T., a basic, two-year college transfer program of core classes is available.

The Oregon Tech campus covers 158 acres in north Klamath Falls and includes nine major and 11 minor buildings. Because of the "hands on" program, many of the classrooms are laboratories with equipment facilities ranging from typewriters and drafting tables to electronic, automotive and industrial tools, to patient clinics for some of the allied health technology fields. Oregon Tech has a large computer center which provides services for the instructional, administrative, and research needs of the college. The geothermal resources available to the school are being researched through the Geo-heat Utilization Center which provides a focus for applied research and development programs for geothermal energy. Two current examples of application experiments are the greenhouse and the aquaculture ponds.

## Education - Current Conditions (5)

### Other Education

In addition to O. I. T., the Division of Continuing Education offers a range of courses, and Klamath Union High School offers several adult education classes. Private education facilities include a beauty college, an art school, and several dance studios.

### Library Facilities

The Klamath County Library, serving both City and County residents, has a volume of 131,000 books, seven daily newspapers, and over 250 current periodical subscriptions, as well as a variety of reference collections. The Library operates with 23 full-time staff and others on part-time and volunteer basis. The main library will show an approximate monthly circulation of 20,000 items plus the extensive services provided to the outlying County areas.

In addition to the books and circulation, the Library offers such special services as Spanish language material, second language materials, political research on State and Federal laws, books and materials for the visually handicapped and a free meeting room for the community.



## Education - Problems (1)

- A few older elementary schools are nearing capacity, possibly requiring redrawing of attendance boundaries to accommodate new subdivisions, or construction of larger facilities.
- Truancy rates continue to detract from the community's overall educational character.
- The costs of maintaining both County and City school systems, with their duplication of personnel and services, continue to burden taxpayers.
- There is lack of a maximum, year-round use of school facilities.
- There is a limited number of outdoor physical education facilities, such as tennis courts, playing fields, et cetera.

### Education - Future Alternatives (1)

- Existing elementary schools will have to absorb piecemeal attendance increases, or new schools will be needed.
- School grounds will increase in importance as neighborhood focal points.
- Maintenance costs will continue to increase.
- Changing enrollment levels at O. I. T. could affect the local economy.
- Both future and existing schools will help define residential areas.

Education - Goals (1)

- To plan and develop a timely, orderly, and efficient arrangement of educational facilities and services.

### Education - Policies (1)

- Land use and transportation decisions should be made in support of school conditions, on a neighborhood basis; the general location of new schools shall be determined by the school district in cooperation with the City in a manner which contributes to the identity of residential areas.
- School sites will be credited with substantial park and recreation values, and also as general neighborhood activity and meeting sites; the costs of schools and parks should be minimized by joint location, acquisition and use of sites for both schools and parks.
- Maximum education opportunity at minimum cost to the taxpayers should be supported.
- The City and O. I. T. will work together to assure compatibility between land uses on private and public lands and within the main campus.
- School locations shall be served by streets which assure a balance between safety and ease of access.
- The City should support and cooperate with the school districts to promote the best use of school facilities, including during summer periods.

## Education - Implementation Measures (I)

- The City should encourage public education and involvement.
- The City should cooperate with City School Districts #1 and #2, Oregon Tech, and the County School District.
- Application for grants should be made to help renovate school buildings and other areas.
- Support for the efficient use of the school tax dollar should be continued.

M A P N O T E

SUB-ELEMENT: EDUCATION

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP DEPICTING THE FOLLOWING ITEMS:

EXISTING SCHOOL SITES

UNDEVELOPED FUTURE SITES

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## RECREATION SUB-ELEMENT

## Recreation - History (1)

The Park Board Commission was created by a vote of the people of the City of Klamath Falls May 27, 1911, following guidelines set for park commissions by the State Legislature in 1889. The money for running a park department was, and is, provided by a tax levy. The responsibilities of this commission included obtaining, equipping and maintaining City parks for the use by and enjoyment of the people of Klamath Falls.

The first recorded park site was a four-block area bounded by Klamath Avenue and Oak Street and First and Third Streets. It was acquired in 1912, but was sold in 1920 to eventually become a mill site.

The 18 parks now in existence within the City range in size from .21 acre of Michigan neighborhood park to the 435 acres of Moore Park. Stukel is the oldest, dating from 1922. The parks differ in appearance also: some are only open grassy areas; others have blacktopping, gym equipment, tennis courts and one, a municipal swimming pool, which was constructed in 1953. Three of the parks were sponsored by local Kiwanians who donated considerable time, effort and funds toward their development. Mills-Kiwanis Park, consisting of 2.39 acres, was created in 1937 and expanded in 1941. Kit Carson-Kiwanis Park, deeded to the City in June of 1949, covers 9.1 acres and holds picnic and playground equipemnt, tennis and volleyball courts and two rough baseball fields. Krause-Kiwanis Park, consisting of 2.8 acres, was deeded to the City in 1961 by DiGiorgio Fruit Company and became a Kiwanis-sponsored park in 1971. It is located at Hanks and Bismark Streets.

Moore Park is by far the City's largest and best-equipped facility. Its 435 acres were donated in several parcels between 1926 and 1946. Improvements made over the years include picnic facilities, playgrounds with a wading pool, a small zoo, tennis courts and an archery range. One area, developed by the Klamath Falls Jaycees in the 1960's, is used as a day camp, and another area has both a scenic drive and a nature trail.

In 1943 plans for an ice rink were discussed, but it was not until 1947 that they became a reality. In 1962, it was in use of 67 consecutive days, but, in general, the major problem of the rink has been the difficulty in keeping it sufficiently frozen since no mechanical refrigeration



## Recreation - History (2)

was ever installed. Another large addition to Moore Park is the marina, construction of which began in the mid-1960's. It provides a public boat launch at the southern end of Klamath Lake.

A Public Recreation Committee was formed in 1924, its members being the mayor and four appointees, but little record of their activities is available. In May of 1938 a Recreation Board was formed, funded by a tax levy, and authorized to hire a "recreation officer"; they did, and Klamath Falls had a recreation program. Records show it to have been very effective, providing a wide range of activities for children and adults alike.

Softball or baseball and aquatic recreations have been two mainstays of the program. Baseball activities started long before the Recreation Department sponsored them; the first city baseball team was formed in May of 1903. During the early 1950's the town boasted a semi-professional baseball team, the Klamath Gems. It is still a most popular sport in the Basin, with several Little Leagues, the Babe Ruth League (chartered in 1956), and the American Legion League all being very active.

City-sponsored swimming, prior to the building of the municipal pool, was in the pool on the old O. T. I. campus. It was necessary for the Recreation Department to provide transportation, though, since the facilities were some distance from the city, and in 1948 fund drives began raising money to construct the geothermally heated downtown municipal pool, which was completed in 1953.

During the 1940's, fishing derbies were popular; after the war, tennis became popular, as it did again in the 1970's. Square dancing was a favorite recreation during the 1950's, a state meeting being held here one year. The ground in Kiger Stadium was covered with plywood to provide a surface on which the several thousand participants could dance. The recreation program also offered such things as dramatic instruction, chess tournaments, bridge lessons, band concerts, dog obedience classes and ice cream socials.

The City Charter was amended in 1958 to join the Park Board Commission and the Public Recreation Committee. They became the Parks and Recreation Board. Over the ensuing years the recreation program has continued to provide a wide variety of both summer and winter programs,

### Recreation - History (3)

primarily for younger people, but not limited to them. In 1966 a contract was made with the City schools to open school facilities for public recreation at specified times under Board supervision. This has widened the scope of activities since indoor programs can be offered over the winter months.

Only a portion of the recreation in Klamath Falls has been under City auspices. July 4, 1879, saw the first recorded horse race -- it was held on a track where the post office now stands. In 1899 the people of Klamath witnessed an air circus featuring a hot air balloon ascension. By 1902 a county fair had been started and 1911 saw the first airplane flight exhibition.

Excursions on the lake were popular for many years when water transportation was at its height, with the *Winema* the largest and most popular vessel. The year 1914 brought the opening of the first art show in the city, featuring local artists and, for the younger set, the opening of the first roller skating rink. Butler's Natatorium was built in 1928 -- it made use of the geothermal waters to provide year-around swimming. It was eventually sold to the school district and is now part of Klamath Union High School.

The locally famous Houston Opera House was built at Second and Main Streets in 1897. It was used as a dance pavilion and community hall, a sports arena for boxing and basketball, and as a stage for stock shows and vaudeville acts. Late in 1900 it provided the people of Klamath Falls with the first motion pictures to be seen in this community. On September 6, 1920, a fire destroyed it. The Houston Opera House held a monopoly on "motion pictures" shown in the city for several years, but in 1909 the Iris Theatre was constructed on North Sixth Street, and seated 250 people. This was followed in 1910 by the Sparks Theatre, and, over the course of 41 years, Klamath Falls has had a total of 17 show places under 22 titles. All that remain are the Esquire, built in 1940, the Tower Theater, built in 1941, and the Shasta Drive-In, which opened in 1950.

Perhaps the best-known odeum was the Pelican Theater. This show place of theaters was the largest between Portland and San Francisco and seated 1,590 people. The theater became a financial burden, closed in 1958, and later was demolished.

#### Recreation - History (4)

One other organization in the City of Klamath Falls has been instrumental in providing recreation programs: the YMCA. It received its first charter for Klamath County on February 10, 1948. The Y gradually grew from a very small beginning to a building on Pine Street. By the late 1960's, because of increased demands for space, plans for construction of a new facility were implemented and the YMCA moved into its current building on South Alameda in 1970.

## Recreation - Current Conditions (1)

Klamath Falls supports a well-established parks and recreation program. Within the City are 18 facilities, 14 neighborhood parks and four special use parks. These are outlined on the following page.

Generally the City's parks and recreation programs are busy. Attendance levels indicate that a large portion of the urban area population is consistently using Moore Park, the swimming pool, most recreation programs, and even some neighborhood parks (primarily Veterans Memorial and Kit Carson). During the three months of the year when the Klamath Falls Municipal Swimming Pool is open, a variety of recreation classes, public swim sessions, and special events are held there. The activities pursued in the pool complex break down to 72 percent user ratio for the swimming pool itself, eight percent for the wading pool, 20 percent usage by spectators and sunbathers. The majority (60 percent) are from the Klamath Falls suburbs, 30 percent of the users are from the City and only two percent are from outlying areas.

Moore Park, the City's premier facility, attracts a diverse group of visitors, representing all ages, origins, and recreational interests. Because of its location, it is reached almost exclusively by auto, and has become a popular gathering spot for young "cruisers" who now constitute its largest user group. The most frequent visitors to the park are City and suburban residents (48 percent and 43 percent respectively), traveling an average of from one to five and from five to ten miles to reach the park. As the City's only regional facility, it receives a large number of visitors from outside the urban area (nine percent). The park's proximity to Highways 97 and 140 contributes to tourist rest stops and picnic uses, and for outlying residents it serves as a regional focal point for recreation, especially lake-oriented activities. Activity participation rates break down as follows (1977 data): picnic, 18 percent; spectators, 17 percent; tennis, 13 percent; field activities, 13 percent; cruising, eight percent; boating, six percent; zoo, six percent; wading pool, four percent; nature trail, two percent; cultural activities, two percent; day camp, one percent; and archery, one percent.

Statistics on the use of Kiger Stadium and Maple Park (the art gallery) are not currently available.

## Recreation - Current Conditions (2)

Park Name Location	Year Founded	Acreege	Playground Equipment	Picnic Facilities	Restrooms	Basketball	Wading Pool	Tennis	Baseball
Conger Delta & Siskiyou	1947	10.6	x	x	x				x
Eldorado Heights* Eldorado & Esplanade	1948	0.4							
Esplanade* Esplanade & Pacific Terrace		0.6							
Fairview Worden & Fairview	1950	3.3	x		x				
Henderson Henderson & Wendling	1944	0.6	x						
Kit Carson-Kiwanis Manzanita to Portland	1949	9.1	x	x	x		x	x	
Krause-Kiwanis Hanks & Bismark	1961	2.8	x	x					
Mills-Kiwanis** Reclamation & Mitchell	1940	2.4			x		x		x
Oregon* Oregon & U.S. 97		0.6							
Recreation & Mills Little League*** Darrow & Richmond	1939	5.3			x				x
Stukel Stukel & Home	1922	0.7	x			x			
Veterans Memorial Klamath/Center/ Main	1944	3.3	(x)	x	x				
Michigan* Michigan & Esplanade	1924	0.2							
Richmond McKinley & Third	1926	0.6	x						
Kiger Stadium Crest Street	1957	8.0	Baseball stadium with bleachers = 4,000 + augmented 1,000						
Municipal Swimming Pool Main Street	1953	2.4	Geothermal, 275,000 gallon pool; bleachers, dressing facilities, wading pool, concession area						
Maple Riverside & Main	1946	1.0	The Moore House (art gallery)						
Moore Park	1926	435.0	Picnic, playground, tennis, wading, scenic drive, marina, day camp, archery, nature trail, sledding, ice rink						

\*No facilities \*\*Craft building, horseshoes \*\*\*Concession building  
(x) Steam locomotive

### Recreation - Current Conditions (3)

The recreation programs begun in 1938 fluctuate with the public interest. To a large extent the City acts as a "clearing house", coordinating the capabilities of private instructors with public needs, rather than maintaining a full-time public recreation staff. The City relies on other organizations as well as its own park system to provide physical facilities for the programs. One primary resource is the public schools, and numerous activities are held both indoors and outside on the school grounds.

The 1977 summer programs consisted of some 22 different activities with a total participation of 2,717. These included: swimming lessons (981), track and field (600), archery shoots (193), Pee Wee softball (182), tennis lessons (160), arts and crafts (133), Babe Ruth baseball (91), baton and tap dance (80), bike races (53), American Legion baseball (39), recreational rowing (29), jogging/walking (29), drama classes (27), skateboard tournament (25), drawing (17), folk dance and creative movement (15), Casey Stengel baseball (15), tumbling for tots (13), slim and trim exercise (11), mountaineering (9), Hatha Yoga (8), beginning ballet (8).

It can be assumed that the largest majority of participants were children, and, to a lesser extent, young adults. Although this is a City-sponsored program, 50 percent of the participants were from the suburbs of Klamath Falls and only 40 percent were from within the City limits. The remaining 10 percent were from outlying areas.

Winter recreation programs included Saturday open gyms at six City schools (Roosevelt, Conger, Mills, Fairview, Pelican and Riverside), swimming at the Klamath Union High School pool, two basketball leagues, volleyball, a Special Olympics recreation program, and adult open gym facilities for such recreation as basketball and tennis one weekday at the junior high school.

Many of the recreational programs include special sessions and activities for the handicapped youth and adults of the Klamath Falls urban area.

The City is not the only entity in the recreation business in Klamath Falls. Oregon Tech offers a wide range of physical education programs on a college credit basis. The County schools, like the City schools, open their facilities to public use under certain special guidelines. Another major element in the urban area is the Wiard Park District, serving the south suburbs.

## Recreation - Current Conditions (4)

Private recreational facilities are also available. The Yacht Club, Klamath Basin Boaters, Reames Golf and Country Club, the Elks Club, Lake Ewauna Rowing Club, the Racquet Club, two gun clubs, private tennis courts, two bowling alleys, a youth center and numerous indoor table game amusements offer recreation for the local citizenry.

One other well-known recreational facility is the YMCA. Its present programs vary from Yoga to soccer, women's weight lifting to modern dance. It also offers classes in various subjects such as interior design and finance seminars. Structured youth leagues in basketball and soccer have also been formed. During the summer the Y provides day camp programs and skills classes to range from sports to art. The aquatics department is one of the best in the county, offering lessons for all ages ranging from infants to adults, and lap swims, open recreational swims, and a handicap swim for those mentally or physically disadvantaged.

The trend today toward more leisure time combined with a growing need to conserve resources will increase the requirements for quality recreational opportunities. The citizens' concern for these matters can be seen in recent Planning Department surveys taken in the Klamath Falls area which show the following public opinions concerning City parks and recreation.

1. Do you feel the community has adequate park and recreation facilities?  
Yes, 55%; no, 40%; no opinion, 5%.
2. Do you feel these parks and recreation facilities are conveniently located to your neighborhood?  
Yes, 68%; no, 25%; no opinion, 7%.
3. Do you feel that the City should consider capital investment in any of the following recreation facilities? (Multiple answers were given.)
 

a. Major reconstruction/remodeling of Kiger Stadium	23%
b. Covering Municipal Swimming Pool for year-around use	28
c. Creation of an additional swimming pool	6
d. Both b and c	17
e. Building an ice skating rink	46
f. Building a large auditorium for special events, performances and meetings	41
g. Creating additional tennis courts	25
h. Constructing a bicycle trail	41

## Recreation - Current Conditions (5)

4. As a taxpayer, would you be willing to support any of these proposed recreational facilities?

Yes, 75%; no, 25%.

If yes, specify. (Multiple answers were given.)

- |                             |     |
|-----------------------------|-----|
| a. Kiger Stadium            | 22% |
| b. Covering Municipal Pool  | 17  |
| c. Another pool             | 6   |
| d. Both b and c             | 14  |
| e. Ice rink                 | 38  |
| f. Auditorium               | 41  |
| g. Additional tennis courts | 19  |
| h. Bicycle trail            | 33  |
5. Do you feel the City should put its parks revenues into:
- |   |     |
|---|-----|
| a. Supporting and improving existing present facilities and programs                | 35% |
| b. Adding new programs and making new capital investment in recreational facilities | 8   |
| c. Both a and b   | 52  |



## Recreation - Problems (1)

- The swimming pool is nearing its effective capacity and is in need of maintenance.
- The tennis courts are nearing their effective capacity.
- The lack of multiple use recreational facilities (such as a civic center) prevents the efficiency and economy of mixing user groups, such as the young and elderly.
- There is a lack of equipment at many neighborhood parks, such as Riverside and Stukel Parks.
- The use of parks for nonrecreational activities (drugs, drinking, cruising) inhibits intended use.
- Certain areas of the city do not have access to park areas within reasonable walking distance, such as Gatewood, Riverside, Nob Hill, and downtown.
- There is the lack of a swimming pool in the southern urban area.
- Certain neighborhood parks, due to lack of facilities or location, do not receive sufficient use to justify maintenance costs.
- The costs of City facilities are not supported by non-City users.
- Many park facilities are in need of extensive rehabilitation and maintenance.
- Most urban types of recreation involve costs (e.g., transportation) which limit the choices available to some citizens.

DETAILED ASSESSMENT NOTE

SUB-ELEMENT: RECREATION

THE CONTENT OF THIS SUB-ELEMENT IS SUPPLEMENTED BY THE FOLLOWING DETAILED ASSESSMENTS WHICH WILL BE ADOPTED BY REFERENCE WITH THE COMPREHENSIVE PLAN.

CITY OF KLAMATH FALLS INVESTIGATION OF  
TODAY'S PARK AND RECREATION CONDITIONS  
(1977)

CITY OF KLAMATH FALLS WINTER RECREATION  
EVALUATION

OREGON DEPARTMENT OF TRANSPORTATION  
STATEWIDE COMPREHENSIVE OUTDOOR  
RECREATION PLAN

COPIES OF THESE ASSESSMENTS MAY BE AVAILABLE FROM THE ORIGINATING AGENCY OR CAN BE INSPECTED AT THE CITY PLANNING DEPARTMENT.

## Recreation - Future Alternatives (1)

- Park needs will increase with population growth.
- Park acquisition and maintenance costs will increase with inflation and greater demand on facilities.
- The citizens' preference for certain types of recreation activities may change, leaving some facilities unused and others overtaxed.
- There should be an increased use of school property and other City open spaces for recreational uses.
- Klamath Lake may continue its eutrophication and become unsuitable for recreational use.
- Due to economic circumstances, private or semi-private recreational programs may cut back their services (YMCA, Yacht Club, et cetera), increasing recreational demands on public facilities.

### Recreation - Goals (1)

- To provide as much choice as possible in recreational alternatives to satisfy the needs of the citizens of the City and its visitors.
- To provide a timely, orderly, and efficient arrangements of recreational facilities and services.

## Recreation - Policies (1)

- A wide range of recreational opportunities should be provided for the urban citizens of all ages including the handicapped and elderly.
- School grounds will be credited as substantial park sites in planning and developing new City parks.
- Parks will be classified as follows:
  - Neighborhood - Up to five acres, located on minor or collector street, no highly structured facilities;
  - Community - Over five acres, located on collector or arterial street, containing structured or specialized facilities.
- The City should continue to seek, acquire, and develop park property on the shorelines of Upper Klamath Lake and Lake Ewauna; waterfront park facilities should be developed to maximize their water orientation.
- A system of equestrian and hiking trails should be established to lead out of the city into surrounding open spaces and scenic areas.
- Support for tourist facilities and accommodations should continue.
- Future recreation programs should prefer non-motorized activities over motorized activities so as to conserve energy.
- The City should continue to improve park and recreation facilities with local, State and Federal funding.
- Utilization of the Work Activity Center personnel for park maintenance should be continued.
- The Park Board should review the park needs annually to determine what people want and what resources are available.
- A cooperative cost sharing program should be developed with the County to achieve a more equitable financing system among urban area users.

## Recreation - Policies (2)

- The community should create and maintain a diversified system of recreation lands and facilities that meets the recreation needs of all people, conserves energy, enhances the environmental quality of the community.

## Recreation - Implementation Measures (1)

- Public education and involvement should be supported.
- A detailed capital improvement program should be developed.
- All tax foreclosure land should be reviewed for potential park or recreational use.
- The City should apply for grants to support recreation and park activities; the City should also establish a recreation/open space fund, which would accumulate revenues over time to apply as matching funds for grants.
- Support of such recreational organizations as the YMCA should continue.
- Recreational or park measures should be developed to be included in zoning and land development ordinances.
- The City should work with schools to allow use of grounds as recreational areas during non-school times.
- Bond measures to allow capital improvements in recreation -- tennis, ice skating, swimming, et cetera -- should be considered.

M A P N O T E

SUB-ELEMENT: RECREATION

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP  
DEPICTING THE FOLLOWING ITEMS:

PARKS

SPECIAL PURPOSE SITES

THIS MAP CURRENTLY EXISTS IN ROUGH DRAFT ONLY, AND IS  
NOT AVAILABLE FOR REPRODUCTION. HOWEVER, DRAFT COPIES  
ARE AVAILABLE FOR INSPECTION AT THE CITY PLANNING  
DEPARTMENT OFFICE.





## TRANSPORTATION SUB-ELEMENT

## Transportation - History (1)

Water

Water provided a rapid and readily available source of transportation in and around the Klamath Falls area from historic times until well after the turn of the century. The Indians plied the lakes and rivers, using canoes or large rafts made from bundles of tules lashed together. The first commercial water transport was George Nurse's ferry across Link River, which ran from 1867 to 1869, when a wooden bridge was built to replace it. Steamboats traveled the lakes and portions of the rivers for many years carrying passengers, freight, and towing logs to the mills.

In 1905 the Klamath Navigation Company set up connections so that a traveler could go from Klamath Falls to San Francisco in 24 hours. The first stage was the 50 miles to Laird's Landing which was covered by boat; then the stagecoach mode of transportation carried passengers the next 45 miles to Bartels on the McCloud River Railroad line. From there trains traveled to join the Southern Pacific and on to the big city, all in one day's time.

The advent of railroad lines into the Basin and the coming of the automobile caused the demise of the extensive water transportation system.

Streets and Highways

The original plat of Linkville and its early additions laid the streets out in grid patterns, with little regard for topography. As a result, ice and snow often make some of the steep City streets impassable. As of 1959, 25 percent of the platted streets had never been opened and only 46 percent of the streets were paved. Since the beginning of the town, Main Street formed a principal thoroughfare, running eastward from Link River. By 1869 the newly formed city had passed an ordinance that sidewalks were to be constructed and maintained along Main Street, property owners being responsible for them. In 1904 Klamath Falls obtained its first rock crusher and street making operation, and set out to improve the quality of the downtown byways.

In 1905 the city was connected to the Altamont area southward when Sixth Street was extended as a gravel road across the intervening swamp. The following year saw the automobile make its first appearance in the

## Transportation - History (2)

area and it was only a few months before an ordinance had been passed limiting its speed on City streets to five miles per hour.

Several improvements in downtown streets were made in 1910-11; Main Street was paved from the Link River bridge to Eleventh Street -- followed by section of Klamath Avenue and several cross streets. The first cement sidewalks were laid along side the new paving, and street signs were installed on all downtown corners. Street lights had been used since electricity became available in the mid-1890's. The South Sixth Street overpass was constructed in 1926, and the 1888 steel bridge across Link River was rebuilt in 1915 and again in 1931. The West Side Bypass around the city was built in 1960 and its bridge over Link River added in 1963; the final off-ramp, exiting near the site of the original Nurse Hotel, was completed in 1967, 100 years after the operation of the ferry commenced at the same location. Most recently completed in the early 1970's was the East Side Bypass channeling south and east traffic around the city for its connection with Highway 97 North.

In the beginning of Linkville's development, pack trains brought goods from Yreka and Jacksonville. Routes in winter were frequently impassable and only crude at best in summer. In 1869, \$600 was used to construct the primary Southern Oregon Wagon Road, its course partially coinciding with the old Applegate Trail.

The Modoc War in 1872-73 increased the flow of traffic considerably because of the military's presence in the Basin. In 1872, \$25,000 was granted by the State to work on the Southern Oregon Wagon Road between Linkville and Ashland. By 1875 it was sufficiently completed to allow a stage line to link Ashland and Linkville. By 1888 the stage was making daily trips between Linkville and Lakeview.

The first report of the Oregon State Highway Engineer was in 1914 and recorded that Klamath County had two miles of roads surfaced with broken stone macadam, 11 miles of gravel roads and 687 miles of dirt roads. Of the major highways that traverse Klamath Falls, three were designated by the Legislature in 1917 but were not completed for many years. The Greensprings Highway (ORE 66), replacing the Southern Oregon Wagon Road -- again primarily following the old Applegate Trail -- was not completely finished

### Transportation - History (3)

until 1937. Oregon 140 (east-west) was open to traffic in 1940 but it was 1968 before all sections were paved. The major north-south route, U. S. Highway 97, carried traffic in 1930 and was completed in 1937. The late 1920's saw the paving of the Merrill Highway (ORE 39) and of the road to Crater Lake (ORE 62).

Vehicular traffic has increased steadily over the years. When Oregon began registering automobiles in 1905 there were only 218 cars in the entire state. By 1940 Klamath County had 15,335 passenger vehicles registered; this increased to 18,389 in 1950, 25,335 in 1960, and 32,573 in 1970. The City, by 1920, recognized that the automobile was here to stay and passed extensive regulations concerning vehicular traffic on the City streets.

### Air

The first airplane in Klamath Falls made exhibition flights during the July 4th holidays in 1911. Two brief flights were made from fields near the railroad depot. In November, 1928, the citizens of Klamath Falls approved the sale of \$50,000 worth of bonds to build an airport. In its early days, the airport had only gravel runways, one fixed-base operator, and no airline service.

As the depression eased, two small private air services were opened, one in 1937 and another in 1940. At the start of World War II, the airport became the Klamath Falls Naval Air Station -- a training command base used to prepare Navy fighter pilots for combat duty. The Navy built many of the hangers still at the airport and constructed the three paved runways. In January, 1948, the Defense Department released the air station back to the City for use as a civilian airport. In 1945, Klamath Aircraft moved to the airport from Worden to a hanger located on the northeast part of the airport. The Air Force moved to its present location on the west apron in 1957 because it was too close to the main runway.

Several firms occupied the largest hanger located on the west apron until Liston Aircraft took it over entirely in 1958. Southern Oregon Aviation, Inc., has used the hanger since 1961.

#### Transportation - History (4)

In April, 1955, a lease between the City of Klamath Falls and the U. S. Corps of Engineers gave approximately 300 acres of exclusive-use airport property and approximately 720 acres of joint-use airport property to the United States Air Force. The Air Force spent millions of dollars initially to extend and rehabilitate the main runway, rebuild taxiways, construct alert hangers and alert stalls, construct a nuclear weapons storage site, et cetera. The main runway was further improved in 1961. Since the arrival of the Air Force in 1955, this City-owned airport has been called a Joint Use Civilian/Military Airport with outstanding cooperation between the two entities. A fighter-interceptor squadron moved here in 1956 and made the field a fully operational Air Defense Command Air Base. In 1971 the squadron was relocated and military personnel dropped from 2,000 to the current 600.

United Airlines came to the airport in 1945 to become the first air carrier, using DC-3 and later Convair-240 aircraft. West Coast Airlines took over the operation in 1953, and in 1959 converted to F-27's. Air West replaced West Coast in 1968, continuing use of the F-27 aircraft. Air West changed its name to Hughes Airwest in 1970, but did not change aircraft until January 1974, when it scheduled a DC-9 jet aircraft.

The growth of passenger service parallels the growth of the entire airport operation. In 1953, West Coast's first flight carried 12 passengers and the year's total was 1,226. By 1960 the annual total had increased to 11,096 and the next ten years saw it rise 50 percent to 16,669; in 1977 there were 28,340 boardings.

#### Municipal Public Transportation

In 1906 a franchise was granted by the City for a trolley line, and from 1907 to 1910 this line served the people of Klamath Falls. It consisted of one horsedrawn car and was known as the "Linkville Trolley" and ran downtown, to the depot and up the lake shore. Late in 1910 the City took control when Klamath Development Company refused to convert to an electric powered vehicle. Their tenure of ownership was short and early in 1911 the trolley line ended.

Taxi service has been available in the city for many years. The Baldwin Hotel had its own "Baldwin Hack" -- a horsedrawn buggy -- to meet

## Transportation - History (5)

the train back in 1909. City licensing requirements for taxis were passed in 1927 and the existing taxi service, now operating a fleet of 11 taxis, has been in operation for 34 years.

There have been several intracity bus services available over the years, the first City franchise being granted in June 1925. However, none of these ventures has ever proved successful. The most recent try at providing bus service was in the early 1970's when KART (Klamath Area Rapid Transit) ran school buses, when not in school use, to provide intracity transportation. The project consumed its limited funding quickly and since then no bus service has been available.

Because of this lack, the Volunteer Services Division (a branch of the Welfare Department) began providing transportation for the needy and elderly utilizing volunteer drivers early in the 1970's. Also, the Senior Citizens Council began providing limited transportation services for the elderly when they obtained a van in July of 1976.

The City school districts began running school buses in the late 1920's: the first motor bus serving the north end of town, carrying children to Pelican School; the second bringing the Klamath Union High School students in from the south suburbs. By 1944, the district was running six buses and over the years new vehicles have been added until 25 now serve the area.

## Bicycling

Bicycle riding has been an activity much practiced in Klamath for many years. However, it is only recently that special paths have been provided for bike traffic. During the early 1970's a paved bike trail was built from the south end of Kit Carson Park to Oregon Institute of Technology. As part of the widening of Shasta Way a few years ago, a designated bike path using the sidewalk area was included in construction. Several other sidewalks built in recent years have ramped curbs at intersections to allow easy access and egress for wheeled vehicles such as bicycles and wheel-chairs. An extensive bike route linking various sections of town by using the bank of the "A" Canal as a pathway will be constructed in 1979.

## Transportation - History (6)

Railroads

The railroad officially arrived in Klamath Falls on June 14, 1909, when the first train pulled into town on the Southern Pacific tracks, newly laid from Weed, California. The expectation was that the line would soon be extended northward, through the Willamette Pass and on to Eugene. The rails were pushed as far as Kirk in the northern part of Klamath County, and as far as Oakridge from the other direction before the project was halted. Because of legal problems involving a monopoly suit, and the war, building on this route stopped until 1922.

In the meantime, the City of Klamath Falls had become involved, monetarily, in the building of the Oregon California and Eastern Railroad, generally known as the "Klamath Falls Municipal". Originally planned to serve the small outlying towns, the line only ran to Sprague River; beginning September 17, 1923, the train carried logs for the mills. The line eventually became the property of Southern Pacific and Northern Pacific; it now belongs to Weyerhaeuser.

During the summer of 1922, the resumption of work on the line across the Willamette Pass resumed, and on June 14, 1926, just west of the Cascade summit at Odell Lake, a golden spike was driven symbolizing its completion. This line gave the City of Klamath Falls a transcontinental hook-up. With Klamath the hub, railroad tracks went north, east, and south to serve the Basin.

Great Northern Railroad had been attempting for several years to extend southward to Klamath Falls. The company finally completed arrangements with Southern Pacific to allow common user privileges on a section of S. P. track and in 1927 G. N. built south from Bend to Chemult and joined the S. P. line. The Modoc Northern Railroad (part of Southern Pacific) linked the Basin with points eastward in 1929. It ran through Merrill to Alturas, California, connecting with the overland route at Fernley, Nevada. The same year Weyerhaeuser expanded and its spur line eastward served the mill. Great Northern extended its rails further south during the early days of the 1930's, joining the Western Pacific tracks at Lookout, California. Klamath Falls was now the center of an extensive railroad tie-up that gave the area an economic boost beyond all expectations.

## Transportation - History (7)

Although freight has always been of major importance to the railroads, passengers have not been neglected. Southern Pacific's well-known "Cascade" train served the city until May 1, 1971, when Amtrak's "Coast Starlight" took over. This is Amtrak's most heavily used, long-distance passenger train and in 1976 a total of 10,603 passengers utilized its services in Klamath Falls.



### Transportation - Current Conditions (1)

Klamath County is served by only one U. S. highway (97) running north and south through the City of Klamath Falls. In addition, the County has seven State highways (ORE 39, 58, 66, 62, 140, 138 and 232). Four of these (140, 66, 62, and 39) are direct connectors to Klamath Falls and the remaining three are interconnectors between other major highway routes. The County also maintains, as of April, 1978, 797 miles of roadway of which 633.5 miles are paved, 123.5 miles are unpaved, and 40 miles are unimproved road.

The City of Klamath Falls reported that its road mileage (as of December 31, 1977) consisted of 11.1 miles of graded and drained (Type C) roads and 66.3 miles of paved roads.

Over these roads travel the 62,315 vehicles registered in the county (2.7 percent of the state total).

#### Vehicle Registration Distribution

Vehicle Type	Number	Percentage
Passenger vehicles	47,892	76.8
Buses	11	0.2
Trucks	1,645	2.6
Farm vehicles	1,372	2.2
Light trailers	1,497	2.4
Heavy trailers	644	1.0
Rental trailers	10	0.2
Motorcycles	2,487	3.9
Travel trailers	3,242	5.2
Campers	1,459	2.3
Motorhomes	532	0.8
Snowmobiles*	755	1.2
Government vehicles	769	1.2
Totals	62,315	100.0

\* Largest number in any county in Oregon.

In August of 1977 the firm of Wilsey and Ham conducted a comprehensive traffic survey of the Klamath Falls urban area to gather data for its Environmental Impact Statement for the South Side Bypass. The traffic survey showed that in 24 hours 7,464 light vehicles passed the intersection of Main Street and U. S. Highway 97 westbound, and 10,776 light

### Transportation - Current Conditions (2)

vehicles traveled over the South Sixth Street viaduct eastbound. The survey showed an average of 217 trucks per day traveling to the Klamath Falls area and a like number beginning their trip in Klamath Falls and traveling to other destinations (see Table 7, pp. 4-14, Wilsey and Ham). According to the report, 85 percent of the westbound traffic (trips beginning and ending outside of the City limits) and 89 percent of the eastbound trips stopped in Klamath Falls for the following purposes.

Purpose	Main Street and U.S. Highway 97 (Westbound)	South Sixth Street Viaduct (Eastbound)
Food	33%	28%
Fuel	18	12
Shopping	10	6
Work	10	15
Personal business	13	21
Other	<u>16</u>	<u>18</u>
Total	100	100

The survey also determined that approximately 15 percent of the recorded trips involved an origin and destination outside the City limits, 33 percent of the trips were from inside to outside the City limits, and 52 percent of the trips were within the City limits only.

Where the numbers of vehicles using the facilities exceed the designed capacity, the City of Klamath Falls has two critical areas of traffic. The first is between East Main Street and Shasta Way on South Sixth Street where the rated Vehicles Per Day (VPD) capacity is 23,500 and the existing volume is approximately 25,500 VPD. The second area is also on South Sixth Street but between Washburn Way and Altamont Drive where the VPD capacity is listed as 22,000 and the existing volume is 22,400 VPD.

A citizen survey conducted by the City Planning Department in the summer of 1977 showed the following responses to transportation concerns in Klamath Falls.

### Transportation - Current Conditions (3)

1. Do you feel that the community's street system allows you to drive safely and conveniently?  
Yes, 45%; no, 48%; no opinion, 7%.
2. Do you think the community needs mass transit alternatives such as buses?  
Yes, 68%; no, 24%; no opinion, 8%.
3. Do you think the community needs bikepaths?  
Yes, 74%; no, 18%; no opinion, 8%.
4. If members of your household walk often in your neighborhood, do you feel they are safe from traffic hazard?  
Yes, 51%; no, 43%; no opinion, 6%.

The June 30, 1978, Klamath County Economic Development Association overall economic development plan lists the following areas of concern in the transportation element.

1. Road improvements particularly repair of Highway 140, both east- and westbound, and U. S. 97 in various areas going north.
2. Feasibility studies for Kingsley Air Base to establish a free trade zone and industrial complex and/or the formation of an airport or a port district.
3. Development of a transportation system for elderly and handicapped persons.
4. The need for construction of a bypass system for South 6th Street.

### Municipal Transportation

The municipal transportation within the City consists of a private taxi fleet of 11 vehicles.

There are two volunteer groups also functioning within the City. Volunteer Services provides transportation to the disadvantaged or handicapped on an on-call basis. There are 17 volunteer drivers serving some 200 people per month and driving between 12,000 and 20,000 miles per month.

The Senior Citizens Council, the other volunteer group, uses its six vans to transport the elderly.

## Transportation - Current Conditions (4)

### Bicycle Pathways

The Klamath Falls urban area currently has three bicycle pathways totaling five miles in length. Owens Bikeway from Portland Street to the O. I. T. campus is 1.7 miles of a Class I bikepath. There are two Class II bikepaths; one 2.0 miles long on South Sixth Street from Patterson Street to the Merrill-Lakeview junction (Highways 140 and 39), the second is 1.3 miles along Shasta Way from the Alameda bypass to Madison Avenue.

In addition, the City of Klamath Falls, in conjunction with Klamath County, has committed its one percent of highway funds received to the "A" Canal bikeway. This 22-mile bikeway would run along the "A" Canal and streets with light traffic to link the business centers and provide a path for touring.

The emphasis on bikeways as another form of transportation in Klamath Falls is based on the following premises:

- a. Bicycle popularity for both recreation and commuting purposes has increased;
- b. The size of Klamath Falls and its terrain make it convenient to ride a bicycle for transportation or for recreation;
- c. A recognized need in Klamath Falls is a well-designed, inter-connecting network of bikepaths. Energy shortages may make it imperative to develop such a system.

### Air Service

The air service to the Klamath Falls area is essentially a feeder service provided by Hughes Airwest. That people in the Basin are flying more is verified by numbers of people who board Hughes Airwest at Klamath Falls. The one-month total (2,477) for May 1978, showed an increase of 23 percent over the total for May 1977, (2,012). The totals for the first five months in 1978 showed 11,786 passengers as compared with 9,999 in a similar period a year ago. During the entire year of 1976, Hughes Airwest carried 23,976 passengers; this increased 18.2 percent in the next year -- 28,340. Air freight service is becoming an increasingly important freight mode, with over 70 tons being moved each year.

In addition to the commercial air service, there are three fixed-base operations at the airport: Citation Air, Inc.; Klamath Aircraft, Inc.; and

## Transportation - Current Conditions (5)

Southern Oregon Aviation, Inc. The combined services cover sales, rentals and maintenance of aircraft, air taxi, ambulance and charter flights, and flight instructions.

### Railroads

The Klamath Falls urban area is a rail center for Amtrak, Burlington Northern Railway and Southern Pacific Railway. There is also the old Oregon, California and Eastern Railroad which Weyerhaeuser purchased in 1975.

Amtrak reported the latest available figures of 10,603 passengers using Amtrak in 1976 on its two trains daily. The most heavily used long-distance train is the "Coast Starlight" which in the first 10 months of 1977 had carried a total of 329,780 passengers, an increase of five percent over the comparable period in 1976.

Burlington Northern operates a switching yard at its line intersection with Southern Pacific lines off Laverne Avenue. An average of six Burlington Northern trains per day, three trains eastbound (north) and three westbound (south) pass through the area. Burlington Northern handles some 10,000 to 12,000 carloads at its Klamath Falls facility in addition to intransit storage and through freight trains.

Southern Pacific Railway has two main lines through the area. The line from the southwest carries an average of 15 trains per day while the Modoc line from the southeast carries five trains per day.

### Bus Service

National and statewide commercial buses now provide one of the major intercity public transportation means in the region. These carriers will continue to play an important part in the public transportation system of the area.

Intercity bus service is provided by both Greyhound and Trailways as interstate carriers and the Red Ball Stagelines which is restricted to communities in Klamath and Lake Counties and selected areas of Eastern Oregon. All bus service is handled through a single terminal located on Klamath Avenue.

## Transportation - Current Conditions (6)

The Greyhound Bus Lines' last available figures are for 1976. They show a passenger count of 189,000 persons per year with a total ticket sales of \$331,000. In addition, Greyhound shipped approximately 15,953 packages out of town and received 39,395 packages during 1976. The figures are exclusive of charter services.

### Truck Freight

Because of the presence of U. S. Highway 97 as a major north-south truck route and Oregon Highways 140 and 39 serving as major connectors to the east and west, Klamath Falls is a large motor freight center today. About six terminals in the Klamath Falls area service 20 or more truck lines.

## Transportation - Problems (1)

- South Sixth Street has reached its effective capacity, causing significant motorist inconveniences and hazards.
- The East Side Bypass, from South Sixth Street to Washburn Way, is threatened by stop-and-go signals and strip commercialism.
- Eldorado Boulevard (Daggett to Esplanade) is carrying large amounts of through traffic in a residential neighborhood with subsequent hazards and nuisances.
- Many major streets in the Original, First, and Section Additions are in poor repair, having been built in the 1910's-1920's, without proper maintenance since.
- Through truck traffic in the central business district continues to cause congestion, hazards, and noise for other motorists and pedestrians, and costly delays for truckers.
- High costs of maintenance, together with significant suburban use of City streets, severely limit City maintenance capabilities.
- Because of the urban area's sprawl, its relatively low density of residential uses, and dispersed job sites, the feasibility of cost-effective mass transit in the near future is limited.
- Bikeway construction is severely limited by small budgetary resources and high construction costs.
- Many sidewalks in the older parts of town are in poor repair, or else completely lacking, creating pedestrian hazards.
- California Street (Nevada to Wocus) is the only collector serving the Buena Vista neighborhood, with subsequent hazards and nuisances.
- Current Amtrak, airline and bus schedules are inconvenient for many potential passengers.

## Transportation - Problems (2)

- Continued maintenance and improvement of the airport is handicapped by its sole dependence on City budgetary resources, rather than County-wide resources.
- There is a problem of controlling speeding on many residential streets (Glenwood, Bartlett, Ridgewood, Sumac, Eldorado, Pacific Terrace, East Main, Orchard Avenue, Division Street, et cetera).
- The lack of special facilities, such as wheelchair ramps and inclined building entrances, impedes the movement of handicapped people in the downtown area; there is also a lack of parking areas for the handicapped citizens.
- Poor freight truck routes create traffic flow problems.
- Shortages of railroad cars affect both the economy and transportation.
- There is a lack of special transportation modes for the handicapped, elderly and/or low-income people.
- There is poor traffic flow in the vicinity of the O. I. T. campus and P. I. H.
- A major concern of the community regarding the transportation system is the need to maintain and improve the livability of residential areas in the face of increasing population and transportation requirements; there is a need to weigh the costs and benefits between improved transportation access for the community as a whole and maintaining livability of established residential areas which have developed along major streets.
- Major transportation routes through the city are not visually attractive.
- Transportation is a major consumer of increasingly scarce energy resources.



## Transportation - Problems (3)

- On-street parking generally adds to congestion, decreases safety and detracts from livability of residential areas.
- Control of access will improve the capacity of a street, reduce accidents, pollution, and congestion.
- Through traffic in the downtown area creates severe problems for businesses because of the noise, exhaust emissions, congestion and safety hazards.
- Pedestrian movements have not been adequately addressed.
- Pedestrian crossings on many major streets are unsafe.
- Continuing urban encroachment around the Municipal Airport will cause restricted aviation operations if allowed to go unchecked.

D E T A I L E D   A S S E S S M E N T   N O T E

SUB-ELEMENT:      TRANSPORTATION

THE CONTENT OF THIS SUB-ELEMENT IS SUPPLEMENTED BY THE FOLLOWING DETAILED ASSESSMENTS WHICH WILL BE ADOPTED BY REFERENCE WITH THE COMPREHENSIVE PLAN.

CITY OF KLAMATH FALLS MUNICIPAL  
AIRPORT MASTER PLAN

CITY-COUNTY BIKEWAY CONCEPT PLAN

KLAMATH COUNTY SOUTHSIDE BYPASS  
ENVIRONMENTAL IMPACT STATEMENT

COPIES OF THESE ASSESSMENTS MAY BE AVAILABLE FROM THE ORIGINATING AGENCY OR CAN BE INSPECTED AT THE CITY PLANNING DEPARTMENT OFFICES.

## Transportation - Future Alternatives (1)

- Citizens will resist efforts to switch from autos to alternate modes of transportation.
- Autos will continue to be the least cost-efficient or energy-efficient mode.
- Pedestrian and bicycle pressures will mount despite remaining auto preference.
- Disadvantaged (handicapped, poor) persons will continue to suffer from lack of public mass transportation.
- Air, rail, and bus links to other communities will become increasingly critical economically and socially.
- Maintenance costs of streets and highways will increase.
- Highway routing will alter land use pressures in adjacent areas.
- Arterial streets will continue to direct traffic near or through largely residential areas.
- Major highway traffic in the western urban area (U. S. Highway 97 and Oregon Highway 140) may increase dramatically because of industry demands in the area.
- The City may have severe financial problems operating Kingsley Field if the Air Force discontinues its operations.
- The loss of a major transportation carrier, i.e., airlines, Amtrak, bus service, would adversely affect the local economy.
- Access control along highways can often provide the most cost-effective means of maintaining highway capacity, and should be implemented wherever feasible.
- Increases in air freight movements may require construction of an air freight terminal at the Municipal Airport.

### Transportation - Goals

- To develop and maintain a safe, convenient, and economic transportation system.
- To provide a timely, orderly, and efficient arrangement of transportation facilities and services.

## Transportation - Policies (1)

- Wherever possible through traffic in residential neighborhoods should be prohibited or minimized.
- Development plans should reflect reasonable needs of motorists but not subvert other needs to the demands of the automobile.
- Particular attention should be given to the needs of the transportation-disadvantaged, such as low-income and handicapped citizens.
- Pedestrians should be given top priority in high density residential and commercial areas.
- Sidewalk construction and maintenance should be appropriate to the needs of pedestrian circulation, especially in school commuting situations.
- All City street rights-of-way should be consistent in the use of traffic controls, signing, and signals.
- Street disruption from utility excavations should be minimized and coordinated among all utilities in the area.
- Any reduction in air, train, or bus schedules should be resisted, and appropriate increases in service should be supported whenever possible.
- Over-reliance on a few streets to carry heavy traffic should be avoided; traffic volumes should be as dispersed as possible.
- Arterials should bound, not divide, neighborhoods or commercial or industrial areas, to ensure safety, efficiency, and neighborhood stability.
- Adequate off-street parking should be provided wherever possible to avoid street congestion and hazards.

## Transportation - Policies (2)

- Streets will be categorized as follows:
  - minor - direct access to abutting properties such as houses or other low generators;
  - collector - carries local traffic within a neighborhood;
  - arterial - carries both local neighborhood and through traffic; should have limited access points.
- The City should develop a bikeway/pedestrian system to connect residential neighborhoods, schools, parks, and commercial areas.
- The Municipal Airport should be protected from the encroachment of incompatible land uses.
- Site access to major residential, commercial, or industrial projects should not cause dangerous intersections or traffic congestion.
- State improvements on intercity highway links between Klamath Falls and other communities should be promoted.
- The movement of freight, as an essential component of the local economy, will be a principal element of transportation planning, and as such the terminals and channels of freight movement should be planned with maximum efficiency in mind.
- Population densities, land use patterns, and peak hour travel patterns should be used as principal criteria in evaluating future development plans.
- Transportation improvements should, wherever possible, utilize existing rights-of-way rather than acquiring new ones.
- Future rights-of-way should be located and acquired and protected as expediently as possible.
- Safe sight distances for pedestrians, bicyclists, and motorists at all intersections of sidewalks, paths, driveways and streets should be assured.

## Transportation - Policies (3)

- Assurance of maximum safety considerations is to be given to all rail-road crossings, including proper sight distances, and motorist warning devices.
- A disaster plan for a major accident in any transportation mode should be maintained.
- The use of circumferential routing should be encouraged for through traffic.
- The transportation system should be designed to minimize negative impacts on abutting areas.
- The transportation system should be designed to recognize and respect the characteristics of natural environmental features.
- The City should make land use decisions that minimize distances to goods and services.
- The transportation system should give special consideration to providing energy-efficient transportation alternatives.
- On-street parking, where inappropriate, should be discouraged.
- The downtown transportation system should be oriented primarily toward the provision of access and parking for area employment centers and commercial activity, as well as provide for the transportation needs of the residents of the area.
- Medium- and high-density residential developments within the urban area should be proximate to adequate arterials.
- Bikeways should be conveniently located, be adequately constructed, have minimal stops and obstructions and have safe crossings on major streets.
- On-street parking should be managed where it conflicts with bicycle corridors.

#### Transportation - Policies (4)

- Land uses which would reduce the ability of the Municipal Airport to function as an element of the transportation system will be discouraged; specifically the Airport should be buffered by nonconflicting uses such as agriculture and limited industrial.
- Multiple-level parking facilities near major traffic generators should be encouraged where feasible.
- New direct access to arterials should be granted only after consideration is given to the land use and traffic patterns in the area of development, not just at the specific site. Frontage roads and access collection points should be encouraged.



## Transportation - Implementation Measures (1)

- Public education and involvement, especially of drivers, pedestrians, and bike riders should be supported.
- The City should support and cooperate with the Oregon Department of Transportation to allow for proper planning and siting of highways, et cetera.
- The City should support and cooperate with County Public Works and Roads Advisory Board.
- The City-County Bicycle Committee should receive support and cooperation to continue developing and maintaining bikeways.
- Car-pooling should be supported.
- Any available State or Federal grant funds that could be used to implement policies should be monitored.
- A detailed capital improvement program should be developed.
- A vehicle count program to monitor traffic levels should be established.
- The City should coordinate with bus, train, and air companies, and request sufficient notice of schedule changes to allow public comment and input.
- Siting requirements for freight-related transportation should be developed to facilitate adequate movement of bus, truck, rail, and air freight within the urban area.
- Access control techniques should be used to coordinate traffic and land use patterns, and to help minimize the negative impacts of growth. Area-wide needs should supersede site-specific needs.
- To ensure a minimization of interruption of traffic flow, and to promote safety, the number of access points to arterials shall be kept to a minimum; the cluster development of commercial and industrial

### Transportation - Implementation Measures (2)

activities should be encouraged; and minimum setbacks of 50 feet from public arterials should be required for commercial and industrial uses.

- Undeveloped lands within the Urban Growth Boundary and near arterials should be designated to receive special consideration for the use of various access control techniques. These lands have the greatest need and potential for access control.

M A P   N O T E

SUB-ELEMENT:      TRANSPORTATION

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A  
MAP DEPICTING THE FOLLOWING ITEMS:

STREET SYSTEM

- Classifications
- Traffic Levels
- Capacities

THIS MAP CURRENTLY EXISTS IN ROUGH DRAFT ONLY, AND  
IS NOT AVAILABLE FOR REPRODUCTION. HOWEVER, DRAFT  
COPIES ARE AVAILABLE FOR INSPECTION AT THE CITY  
PLANNING DEPARTMENT OFFICE.

M A P N O T E

SUB-ELEMENT:      TRANSPORTATION

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A  
MAP DEPICTING THE FOLLOWING ITEMS:

ALTERNATIVE MODES

- Bicycle Routes
- Mass Transit Resources

THIS MAP CURRENTLY EXISTS IN ROUGH DRAFT ONLY, AND  
IS NOT AVAILABLE FOR REPRODUCTION. HOWEVER, DRAFT  
COPIES ARE AVAILABLE FOR INSPECTION AT THE CITY  
PLANNING DEPARTMENT OFFICE.



## WATER SERVICE SUB-ELEMENT

## Water Service - History (1)

The water supply for the town of Linkville was primarily from cisterns catching rain water, and from the numerous springs around the area. Conger Avenue, North Fourth, North Eighth, Pine Street, and Klamath Avenue were sites of water sources, the latter, the Klamath Avenue Spring, providing water for the early school. In addition, some of the hot water wells also were used as drinking water sources, the hot water being retained in a holding tank until it was cool. These numerous small springs, the cisterns, and a few hand-dug wells provided sufficient amounts of water for the town for several years.

In April 1895, the City granted a franchise to H. V. Gates to construct and operate a water system in conjunction with an electric service he was also providing. The deep springs near Conger Avenue were to be the major source for the system; in 1896, the first reservoir, located at Fifth and Grant Streets, was completed.

In 1911, the California Oregon Power Company (COPCO) purchased the Klamath Falls Light and Water Company. Over the next few years, the new owners replaced some of the smaller rock reservoirs with steel ones and drilled three wells to supplement the springs. With the addition of new pumps in 1920, the company could provide a 1,300-gallon-per-minute flow and served over a thousand customers.

The expansion of the railroads and the resulting growth of the lumber industry in the Basin in the mid-1920's boosted the population of Klamath Falls. To help meet the increased water needs, COPCO constructed an 800,000-gallon reservoir adjacent to the existing facility at North Sixth and Grant Streets, and two more wells were drilled.

The city continued to spread and a 400,000-gallon reservoir was constructed in 1930 and the old original reservoir was abandoned. By 1931, the water was needed further eastward, so COPCO built a 400,000-gallon steel tank up on the hills. During the decade of the 1940's, the COPCO system had an annual growth of customers of 33 percent; the number of feet of distribution mains during this time increased on the average of 2.1 percent per year.

Oregon Water Corporation purchased the water system from California Oregon Power Company on July 15, 1950. Since Oregon Water took over, the

## Water Service - History (2)

number of customers served has averaged an annual increase of 1.3 percent; the net additional distribution increased 1.5 percent each year. Also, during this period, over 71,000 feet of pipe was retired or replaced with new pipe.

Most of the wells are adjacent to the original Conger Springs area. One is located at the north end of Link River on Nevada Street, and one south of town on Kelly Road. Not all of the wells are in use at one time. Average consumption is 4.2 million gallons per day in winter, with peaks having reached 13 million gallons per day in hot summer weather.

On January 25, 1978, the people of the City of Klamath Falls voted approval for a bonding issue, enabling the City to purchase the water system from Oregon Water Corporation; they took over management May 1, 1978.

Water Service - History (3)

Oregon Water Corporation/Klamath Falls System  
Customer Count and Consumption

Class of Service	1970	1971	1972	1973	1974	1975	1976	Average Annual Increase
Residential	8,469	8,954	9,090	7,063	9,650	9,780	9,918	
Commercial and industrial	996	984	1,004	914	1,035	1,035	1,071	
Fire protection (private)	46	48	47	44	50	50	59	
Fire protection (public)	4	3	3	3	5	5	3	
Public authority	<u>34</u>	<u>32</u>	<u>37</u>	<u>68</u>	<u>80</u>	<u>80</u>	<u>65</u>	
Total	9,729	10,021	10,181	8,092	10,820	10,950	11,116	2.4%
Total consumption (measured by 100 c.f.)	2,630,213	2,476,697	2,548,318	2,868,554	2,649,352	2,658,207	2,634,439	

SOURCE: Annual reports to Oregon Public Utilities Commission



## Water Service - Current Conditions (1)

The Water Division of the Public Works Department of the City of Klamath Falls serves approximately 11,200 customers. The average increase in customers since 1970 has been 2.4 percent annually while consumption has remained relatively constant at about 2,600,000 cubic feet per year. The table on the following page shows a breakdown of the type of service, number of customers, and water consumption for 1976.

Water is obtained from wells in and around the city. There are currently five wells producing for the system: the Fremont Well, Conger Wells Number 8, 9, and 10, and Henley. The Pinegrove well is presently inactive. There are 12 boosters and five pumping stations to aid flow and 12 storage reservoirs having a combined capacity of over 6.5 million gallons (mg).

These include the following:

Center Reservoir Number 1	0.800 mg
Center Reservoir Number 2	0.800 mg
High Level Reservoir	0.400 mg
Hospital Reservoir	0.500 mg
Melrose Reservoir	0.800 mg
North Reservoir	0.500 mg
Shasta Reservoir	0.420 mg
South Reservoir	1.000 mg
Lindley Hill Storage	0.018 mg
Ogden Reservoir	1.000 mg
Lynnewood Number 1	0.150 mg
Lynnewood Number 2	0.150 mg

The pipe carrying the water throughout the system ranges in size from three quarters inch to 20 inches in diameter. The greatest portion (46 percent) is cast iron with asbestos cement and galvanized iron forming 24 percent and 23 percent of the materials respectively. O. D. steel (5 percent), ductile iron (1 percent), copper (less than 1 percent), and PVC plastic (less than 1 percent) make up the remainder of the more than 177,200 miles of line that provides water to the people of Klamath Falls.

In general, the total value of the land, equipment and supplies of the Water Department is over \$7 million. Historically the operation of the utility has been stable with revenues increasing at the rate of 7.1

Water Service - Current Conditions (2)

Oregon Water Corporation  
 Average Customer Count and Annual Consumption  
 By Class of Service - 1976

Class of Service	Customers		Total	Consumption (100 c.f.)		Total
	Inside City	Outside City		Inside City	Outside City	
Residential	4,700	5,226	9,926	901,047	917,540	1,818,587
Commercial	725	321	1,046	377,476	361,822	739,298
Industrial	16	12	28	116,297	42,327	158,624
Fire protection (private)	35	24	59			
Fire protection (public)	1	2	3			
Public authority	54	11	65	47,831	4,168	51,999
<b>Total</b>	<b>5,531</b>	<b>5,596</b>	<b>11,127</b>	<b>1,442,651</b>	<b>1,325,857</b>	<b>2,768,508</b>

SOURCE: Oregon Water Corporation.

### Water Service - Current Conditions (3)

percent since 1970. During the same period all operation expenses increased at a 7.8 percent rate, necessitating a rate increase in April of 1977.

Statistics on the amount of water used by subscribers vary, but it has been estimated that the average per household is 900 cubic feet per month with uses of from 1,200 to 1,500 cubic feet not uncommon. The water from the wells is relatively pure and requires no treatment prior to use, except chlorination.

There are several small districts serving the fringes of the urban area. These include Moyina Heights which serves a section of the south suburbs, as does the Skyline Water District; the Owens Water Company serves the Stewart Lennox area. All water for these systems is obtained from wells.

### Water Service - Problems (1)

- Some areas have low pressure, which is particularly important for fire protection.
- Some areas do not have sufficient pipeline capacity for distribution needs.
- The majority of the distribution system is geographically skewed away from the primary source wells, requiring costly transmission and storage compensations.
- Some higher elevation buildable lands cannot be served without creating new, higher pressure zones.
- There are problems of poor fire hydrant proximity and sufficient fire flow in some portions of the urban area.

D E T A I L E D A S S E S S M E N T N O T E

SUB-ELEMENT: WATER SERVICE

THE CONTENT OF THIS SUB-ELEMENT IS SUPPLEMENTED BY THE FOLLOWING DETAILED ASSESSMENT WHICH WILL BE ADOPTED BY REFERENCE WITH THE COMPREHENSIVE PLAN.

CITY OF KLAMATH FALLS WATER  
DISTRIBUTION SYSTEM ANALYSIS

COPIES OF THIS ASSESSMENT MAY BE AVAILABLE FROM THE ORIGINATING AGENCY OR CAN BE INSPECTED AT THE CITY PLANNING DEPARTMENT OFFICES.

Water Service - Future Alternatives (1)

- Lack of conservation of delivered water will continue to press costs upward.
- Maintenance costs will continue to rise.
- Deterioration of older lines will accelerate and replacement costs will increase.
- Costs will continue to rise for extending services to new developments.

Water Service - Goals (1)

- To provide a timely, orderly, and efficient arrangement of water facilities and services.

(1) Water Service - Future Alternatives (1)

- Maintenance costs will continue to rise.
- Deterioration of older lines will accelerate and replacement costs will increase.
- Costs will continue to rise for water service to new developments.

SUB-ELEMENT: WATER SERVICE

THE CONTENT OF THIS SUB-ELEMENT IS SUPPLEMENTED BY THE FOLLOWING DETAILED ASSESSMENT WHICH WILL BE ADDED BY REFERENCE WITH THE COMPREHENSIVE PLAN.

CITY OF ELKATH FALLS WATER DISTRIBUTION SYSTEM ANALYSIS

COPIES OF THIS ASSESSMENT MAY BE AVAILABLE FROM THE DESIGNATING AGENCY OR THE CITY PLANNING DEPARTMENT

### Water Service - Policies (1)

- The City should continue to develop well sources, storage capacities, and distribution capabilities to ensure the availability of adequate water supply and pressure in the system's service area.
- Adequate water service, either existing or immediately attainable, will be a precondition to any development project.
- All water system extension should be within the Urban Growth Boundary.
- The City should maintain a water rate structure capable of maintaining and improving the water system.
- Large developments or heavy water users should make equitable contributions to the improvement of the water system, and pay all costs associated with the extension of the water line.
- Water lines in proposed developments should be adequately sized to meet future needs at the projected usage or density, including fire flow requirements.
- The high standard of water service within the community should be maintained.



## Water Service - Implementation Measures (1)

- Public education and involvement should be supported.
- A detailed capital improvement program should be developed.
- The City should apply for grants for upgrading of the water system.
- Ordinance requirements should be prepared for new areas with water system requirements.
- A water rate should be established which charges the same amount for additional units over a base rate rather than a decreasing scale, and rates of large users should be reviewed to ensure they are equitable in relation to small users.
- All plans for water system improvements and water line extensions should be submitted to appropriate regulatory agencies for review and approval prior to construction.
- The City should coordinate with adjoining private water systems to develop proper planning of areas.

M A P N O T E

SUB-ELEMENT: WATER SERVICE

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP DEPICTING THE FOLLOWING ITEMS:

## WATER SYSTEM

- Wells
- Lines
- Tanks
- Pumps

THIS MAP CURRENTLY EXISTS IN ROUGH DRAFT ONLY, AND IS NOT AVAILABLE FOR REPRODUCTION. HOWEVER, DRAFT COPIES ARE AVAILABLE FOR INSPECTION AT THE CITY PLANNING DEPARTMENT OFFICE.



## SEWER SERVICE SUB-ELEMENT

## Sewer Service - History (1)

As the population of Linkville and later Klamath Falls grew, homes became more numerous and sewage volumes greater. Open land dwindled and individual septic tanks were no longer practical or safe.

On April 21, 1919, the residents of the City voted a bond issue for the construction of a sewer system. The sale of \$45,000 worth of bonds was authorized by the Council in May, and on June 22 an engineer was hired to begin the initial phases necessary for the construction of a sewer district. In 1920 a contract was entered into by the City with a construction firm to begin the actual work. The initial area to be serviced was the downtown neighborhood. A septic tank was constructed to serve as a treatment site before outflow into Lake Ewauna, 260 feet away. This initial unit was energized by gravity flow only.

It became apparent during the 1920's that the septic tank system was inadequate. An investigation of existing conditions and a feasibility study for a treatment plant were begun in 1925. Voters approved bonding of a new plant in 1928 and \$300,000 worth of bonds were put on sale. This first treatment facility was constructed by the City in 1929, across Lake Ewauna near the railroad bridge, and it was only the second mechanical plant designed and built in Oregon. In 1943 the U. S. government built a "Clarigester" type treatment plant (a combination clarifier and digester process) at the end of Owens Street in the Mills Addition to handle the government housing, now known as the Shasta View Apartments. This plant was eventually sold to the City. In 1945, the U. S. Navy constructed a treatment plant at Kingsley Field, but it was never operated. It was given to the City after the war and when Kingsley Field Air Force Base was activated in the mid-1950's, it was upgraded and put in to use.

The two City plants continued operations until 1958. At that time a trickling filter plant was constructed at the west end of Spring Street to replace the older facilities. It had a capacity of primary treatment for six million gallons per day, but the secondary treatment, the trickling filter, could only handle 2.4 million gallons per day. In 1970, the Spring Street sewage treatment facility was modified from the trickling filter operation to the conventional activated sludge process. New aeration basins,

### Sewer Service - History (2)

a secondary clarifier, sludge thickener, and a blower and centrifuge building were constructed. This modification increased the plant capacity to 6.0 million gallons per day average daily flow.

In 1960 restrictions were placed on hot water discharges into the system, curtailing such discharges considerably. In 1968, because of the necessity for upgrading the existing plant and lines, a monthly sewer fee for all users was initiated.

## Sewer Service - Current Conditions (1)

The Spring Street Sewage Treatment Facility utilizes a conventional activated sludge process and has the capacity of 6.0 million gallons per day (mgd) average daily flow.

Presently the system serves nearly 5,000 hook-ups. The average daily flow on a yearly basis is approximately 3.05 mgd (11,540 cubic meters per day) which is about half of the design capacity of the activated sludge treatment plant. During periods of heavy rainfall or snow melt, the flow received increases because of the infiltration problems in the system.

The influent comes into the plant through a 36-inch line where three pumps (with a total capacity of 18 mgd) discharge the raw sewage into the grit channel for primary treatment. Here a "solids shredder" -- two 25c communitors -- reduces any large items to particles. The flow is then directed through a clarifier where solids settle out and are pumped to the primary digester. Secondary treatment begins with three adjacent aeration basins which have a total volume capacity of 100,000 cubic feet. After aeration, the flow goes through a 100-foot diameter circular clarifier for additional sludge settling. The effluent then passes through a chlorine contact basin for disinfection prior to being discharged into Lake Ewauna.

The sludge that is removed from several points along this system is passed through a sludge digestion process. It is then dried and disposed of either through use as a soil conditioner fertilizer or as part of the County sanitary land fill.

The following diagram illustrates the flow and treatment processes at the Spring Street facility.

The sewage flows entering the treatment plant are primarily domestic in nature, originating in the residential and commercial areas. What industrial discharges that do occur are generally low in toxicity because of low flow and/or weak composition. The local major industries are primarily lumber, and the mills generally have their own treatment facilities. The agricultural industries within the City are mainly dairy products, and although the organic load is high, at the present time the capacity of the plant is not hindered.

Currently the Spring Street Sewage Treatment Plant is producing effluent far superior to the degree of treatment required by the Waste Discharge

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Currently the Spring Street Sewage Treatment Plant is producing effluent far superior to the degree of treatment required by the Waste Discharge Act.

### Sewer Service - Current Conditions (3)

Permit. This facility continuously attains BOD (Biochemical Oxygen Demand) and SS (Suspended Solids) reduction to less than 10 mg/l and normally to 2-5 mg/l; the inflow of BOD and SS to the system averages some 11,000 pounds each per day. Because of the topography of the city, several sewage lift stations are in use within the system.

In addition to the Spring Street Plant, the City also has a treatment plant at Kingsley Field which handles approximately .24 mgd. It serves the air base, the Falcon Heights military housing area, and the Gatewood area of the City. This treatment plant is an activated sludge type that uses compressed air for aeration and anaerobic digesters for sludge disposal. The plant effluent meets the Waste Discharge Permit standards before it is discharged into Lost River.

The southeastern portion of the urban area outside the City limits is serviced by the South Suburban Sanitary District. This district uses a lagoon system consisting of four oxidation ponds. The entire South Suburban Sanitary District collection system drains by gravity flow into the pump stations at the treatment facility. Flow rates average 2.01 mgd during the dry season and 2.67 mgd during the wet season; the average peak is 3.63 million gallons per day.



## Sewer Service - Problems (1)

- A few isolated properties are not able to receive sewer service.
- Inflow of storm drainage waters, and infiltration of groundwater constitutes an occasional over-burden on the treatment plant with raw sewage discharge into Lake Ewauna.
- Areas with excessive slope (greater than 30 degrees) create problems in establishing proper sewer lines.
- Certain problems exist in current sewer line sizes and layout due to age of system and technological changes.
- The Environmental Protection Agency has required that no toxic industrial materials can be flushed into the municipal sewer system after 1982.

D E T A I L E D   A S S E S S M E N T   N O T E

SUB-ELEMENT:      SEWER SERVICE

THE CONTENT OF THIS SUB-ELEMENT IS SUPPLEMENTED BY THE FOLLOWING DETAILED ASSESSMENT WHICH WILL BE ADOPTED BY REFERENCE WITH THE COMPREHENSIVE PLAN.

KLAMATH BASIN REGIONAL WASTEWATER  
FACILITIES PLAN

COPIES OF THIS ASSESSMENT MAY BE AVAILABLE FROM THE ORIGINATING AGENCY OR CAN BE INSPECTED AT THE CITY PLANNING DEPARTMENT OFFICES.

## Sewer Service - Future Alternatives (1)

- Maintenance costs will increase.
- Treatment quality standards will increase as will standards for quality of discharge.
- Deterioration of older lines will accelerate and need replacement.
- New technology may change the process of sewage treatment altering cost figures.
- New industries may create treatment problems or require special treatment procedures for sewage.
- Capacity of some mains may be exceeded, requiring modification of the system.
- Requirement for tertiary treatment in 1980 may be enforced by the U. S. government.

### Sewer Service - Goals (1)

- To provide timely, orderly, and efficient arrangement of sewer facilities and services.

## Sewer Service - Policies (1)

- The City will endeavor to provide all residents within the City adequate sanitary sewer service.
- Adequate sewer service, either existing or immediately attainable, will be a precondition to a development project.
- The City will attempt to maintain adequate treatment facilities and explore alternative, low technology treatment systems based on the recovery of resources, minimal energy costs and compatibility with peak usage patterns.
- Large developments should make equitable contributions to improvement or replacement of the sewage treatment system.
- New industrial developments should be required to meet Federal discharge standards.
- In order to meet urban needs, separation of sanitary and storm sewer effluents should be completed and maintained.
- The expansion of the sewer system should be a major factor in managing urbanization.

### Sewer Service - Implementation Measures (1)

- Steps should be taken to eliminate storm drainage water from sanitary sewer lines.
- Public education and involvement on sewer system needs should be supported.
- A detailed capital improvement program should be developed.
- The City should apply for grants to improve and maintain the sewer system.
- Plans for all sewer improvements shall be submitted to appropriate regulatory agencies for review and approval.
- Plans and alternatives to deal with major plant failures should be developed.
- Plans and alternatives to meet PL 92:500 tertiary sewage treatment requirement should be developed.
- The use of innovative, individual systems, such as composting toilets, should be evaluated.

M A P N O T E

SUB-ELEMENT: SEWER SERVICE

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP DEPICTING THE FOLLOWING ITEMS:

SEWER SYSTEM

- Plants
- Lines
- Pumps

THIS MAP CURRENTLY EXISTS IN ROUGH DRAFT ONLY, AND IS NOT AVAILABLE FOR REPRODUCTION. HOWEVER, DRAFT COPIES ARE AVAILABLE FOR INSPECTION AT THE CITY PLANNING DEPARTMENT OFFICE.

## S T O R M   D R A I N A G E   S U B - E L E M E N T

## Storm Drainage - History (1)

In most instances when rain strikes open ground, a fair portion of the moisture is absorbed into the soil and there is minimum runoff. Urbanization, in the form of construction and paving, effectively seals the ground surface and water cannot penetrate the soil. It then becomes a problem that must be dealt with. In an urban area, the answer is proper storm drainage.

As the municipal sewer service developed, beginning in 1909, storm drain systems were also installed. These lines extend to the Spring Street Sewage Treatment Plant and, bypassing treatment, empty into Lake Ewauna. The major portion of the downtown area is serviced this way. In those areas, such as the north end of town, where drainage is away from the downtown area, runoff goes directly into the upper lake. The old Ankeny Canal served to carry surface water away for many years, and in those areas lying above the "A" Canal, some runoff flows into that canal.

Problems have arisen over the years in that storm drains have been connected to sewer lines. In this case, storm runoff contributes to the flow level of the sewer line, often times adding sand and debris to the sewer system and having a detrimental effect on treatment facilities.

Generally, the more drastic runoff problems occur in the summer when severe thunder storms drop large amounts of rain on a localized area in a short time. Streets resemble rivers and such low places as the railroad underpass become completely flooded. Although not a frequent occurrence, this has happened several times over the years, resulting in localized flooding and over-loading of both the storm drainage and the sewer systems.

Winter storms generally produce precipitation in less volume over a longer period of time, and runoff at current levels can be handled. Normally the excess water caused by heavy rains and/or rapid snowmelt is drained away via the various drainage ditches. The level of Upper Klamath Lake is controlled by the dam at the head of Link River, and that of Lake Ewauna by the Keno dam. However, in December of 1964, serious problems arose when over two inches of rain fell in one 24-hour period and precipitation for that month totaled almost nine inches. The upper lake rose .3 to .4 feet per day and the river could not handle the runoff, causing extensive flooding in lower areas of the Basin. The Keno dam has since been



### Storm Drainage - History (2)

replaced and the Klamath River dredged giving better control of Lake Ewauna water levels and providing more control of heavy storm drainage on a basin level.

Over the past few years, land use planning has improved and as a part of this, more extensive and better designed storm drainage is being provided.

## Storm Drainage - Current Conditions (1)

Storm drainage in the City relates to the physical situation involving the amount of runoff occurring during a storm and the way to handle it.

This physical problem in the City is that generally the drainage water will originate in the Hogback Mountains and Plum Hills area to the east and north of the City. The drainage water is carried in a southerly direction by small, seasonal channels and creeks which flow into the existing drainage and canal systems. Where the land has not been "improved" by urbanization, a fair portion of the precipitation seeps into the ground and runoff is minimal. However, where building has occurred, it has reduced the amount of open ground and a large portion of any storm accumulation becomes runoff.

On the westerly side of the City, there is some storm drainage into the Link River and Lake Ewauna. The inflow into the natural water systems of the lakes and rivers is then controlled by flood control dams and diversions located along the waterways. On the easterly side of the City, the storm drainage does not flow into natural waterways, but into the man-made canal system.

The first immediate problem of storm drainage in the City is the dramatic effect of rainfall on the diurnal sewage flow patten in the City sewer lines. The Klamath Basin Regional Wastewater Facilities Plan shows that rainfall greatly increases the sewage flow during storms. When there is excessive short-time rainfall, or when heavy storms occur during peak sewage flows, the inflow to the City sewage treatment plant approaches plant capacity.

The second immediate storm drainage problem involves the inflow of runoff water into the "A" Canal which was designed for a nominal capacity of 1,100 cubic feet per second (cfs) of controlled water flow. The Klamath Irrigation District tries to maintain a headgate flow of 1,025 cfs whenever possible. However, because of storm drainage inflow, irrigation demands, or other requirements, this rate may be exceeded from time to time. The highest flow recorded in the "A" Canal was on June 24, 1961, when it reached 1,180 cfs. The flows have ranged from 800 to 1,100 cfs when heavy irrigation demands have occurred; the system was not designed to carry additional, unplanned flows of storm drainage waters.

## Storm Drainage - Problems (1)

- A majority of the city does not have proper drainage facilities, using surface drainage instead.
- Surface drainage results in general water quality degradation as a result erosion and pollution by petroleum and lead particles in streets and parking lots.
- Storm drains in some areas empty into the municipal sewer system, creating discharge problems for the sewage treatment plant.
- Federal and/or State agencies are beginning to enforce water quality regulations which could affect land development in the area.
- Currently when the "A" Canal is at maximum irrigation flow, and this is combined with additional storm drainage inflow, a flood hazard could result.
- Development of land on the sloping portions of the City increases storm drainage runoff.
- Implementation of 208 section PL 92:500 on non-point source runoff will increase water quality maintenance difficulty.
- Open drain areas such as 1-C Drain, 1-C-7 Drain, and many others are breeding habitats for mosquitoes and other nuisance insects.
- Geothermal runoff may create thermal pollution of Klamath Lake and Lake Ewauna.
- Storm runoff in sewer lines causes a temporary overload of the sewer system.
- Delays in developing storm drainage plans due to jurisdictional disputes between agencies may affect the rate of development in certain areas of the City.

### Storm Drainage - Problems (2)

- Inadequate protection of drainage ways with construction immediately adjacent to these drainage areas has resulted in property damage to adjacent lands, promoted siltation, destroyed natural vegetation, precluded recreational use, and decreased open space.
- The uncontrolled filling in of banks of watercourses and other areas along drainage ways destroys open space and recreation potential and reduces water storage capacity.

## Storm Drainage - Future Alternatives (1)

- Continued development and construction of impervious surfaces will increase quantity of runoff.
- Quality of runoff will decrease with greater exposure to contaminants.
- Maintenance costs will continue to increase.
- Costs to develop a separate storm drain system are high.
- Water quality standards for both point and non-point source discharges will be higher.
- Other Federal or State agencies may establish development moratorium to maintain water quality and reduce flood hazard.
- Major drainage ways could be valuable as recreation linkages for bike-paths, hiking and jogging trails in the urban area.

### Storm Drainage - Goals (1)

- To provide a timely, orderly, and efficient arrangement of storm drainage facilities.
- To protect life and property from drainage-related hazards and damages.

## Storm Drainage - Policies (1)

- Storm water flows within and to natural drainage courses will not, through development, exceed natural capacities within the City.
- Construction practices will take steps to ensure that storm water flows are not exposed to cuts, grading areas, and trenches in such a way as to allow adverse direct flow into natural drainage courses.
- Wherever possible road crossings of major natural drainage courses will be minimized.
- New developments will limit storm runoff outside project boundaries by appropriate measures; where applicable new developments shall intertie new drainage facilities with existing adjacent facilities.
- Adequate drainage facilities, either existing or immediately attainable, will be a precondition to any development project.
- The extent of continuous, impervious paved surfaces should be minimized, and large parking or paved areas should be subdivided with functional planting strips with exposed soil or proper drains.
- The enclosing of drains such as I-C, I-C-7, et cetera, to reduce hazards should be supported.
- Vector control to reduce insect problems in drain areas should be supported.
- In order to meet urban needs, separation of sanitary and storm sewer collection systems should be completed and maintained.
- Drainage ways will be dedicated for the purpose of storm water collection when property develops. Where adequate dedications exist, utilization of bankside areas may provide a recreation resource.

### Storm Drainage - Policies (2)

- Use of fill matter in permanent and/or dedicated drainage ways should be regulated.
- Building in floodplains or major drainage ways should be prohibited except in accordance with adopted regulation.
- Drainage ways should be kept in a natural state preserving tree lines and natural vegetation wherever possible.



### Storm Drainage - Implementation Measures (1)

- Public education and involvement of and in the needs of a proper storm drainage system should be supported.
- A detailed capital improvement program should be developed.
- The City should apply for grants to help develop a proper storm drainage system to service the urban area.
- Storm drainage requirements for new land developments should be developed.
- Funds should be budgeted to correct current drainage problems along streets and roads and within present storm drain system.
- Regulations to set storm drain standards for roads and streets crossing or affecting a natural storm drain area should be developed.
- Proper techniques for handling special runoff problems such as thermal pollution from geothermal activity should be developed.

M A P N O T E

SUB-ELEMENT: STORM DRAINAGE

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP DEPICTING THE FOLLOWING ITEMS:

DRAINAGE BASINS

LINES

RELATED FACILITIES

THIS MAP CURRENTLY EXISTS IN ROUGH DRAFT ONLY, AND IS NOT AVAILABLE FOR REPRODUCTION. HOWEVER, DRAFT COPIES ARE AVAILABLE FOR INSPECTION AT THE CITY PLANNING DEPARTMENT OFFICE.



## S O L I D   W A S T E   S U B - E L E M E N T

## Solid Waste - History (1)

Solid waste, which includes garbage, refuse and rubbish, but also includes industrial, demolition and wastes from every area of endeavor, is produced in direct proportion to the area's population.

Solid waste can be disposed of by several methods which include land-filling, composting and incineration. The most desirable method of handling this waste includes resource recovery or recycling.

The early townspeople wasted as little as possible and disposed of what garbage there was in many of the aforementioned ways. As the town grew, particular areas became popular dumping grounds for refuse, and these, in turn, became problem areas. Fires would start and smolder for long periods of time, light trash was blown over a wide area, and rodents and vermin proliferated. Exactly where all these local dumps were located is now known; however, one in close proximity to town was supposedly near where the new Elks Lodge now sits, above the west shore of the lake. Another popular place to conveniently throw rubbish was the open Ankeny Canal, posing both a health and an aesthetic problem.

In 1911, the City purchased two parcels of ground to be specifically used for solid waste disposal, and eventually dumping was prohibited in any other locations. One site was on the west hill, above Lake Ewauna; the other location was east of town off the Old Fort Road.

The City created an office of City Scavenger in February 1919, and this office was the beginning of refuse collection for Klamath Falls. Thereafter, the City required its residents to dispose of garbage in an acceptable manner. In 1926, the municipal collection gave way to franchise to private concerns. That same year the City also purchased additional land near the west side dump to provide more space. These west side areas are no longer used and all collection from the City currently goes to the Old Fort Road site for disposal. This latter site was sold to the County in 1977 as part of a County program to manage solid waste.

Federal and State regulations passed in the late 1960's and early 1970's had a large impact on solid waste disposal. Burning could no longer be used to reduce volume and, as of July 1, 1972, an operation called sanitary land fill had to be practiced. This requires compacting

## Solid Waste - History (2)

the rubbish and covering it with a layer of dirt. These new practices proved advantageous in several aspects of solid waste management, especially the environmental aspect. Air quality improved (no burning), volume decreased (compaction), and wind distribution of loose trash, health, safety, vector control, and aesthetics all improved because of the dirt cover. Economically, however, such treatment does cost more.

The returning of such materials as glass, metals and paper products to be reused in the manufacture of new products is known as recycling. This form of conservation is widely practiced in many large metropolitan areas, both as an answer of what to do to reduce the ever-increasing volumes of solid wastes, and to retard the depletion of non-renewable resources. Perhaps the most well-known form of recycling, especially in Oregon, is the returning of beverage bottles to the manufacturer via the retailer. Oregon's Bottle Bill, passed in the early 1970's, is nationally known. It requires deposits be paid on beverage containers at the time of purchase, redeemable upon return of the empty bottles.

### Solid Waste - Current Conditions (1)

The County is responsible for 13 solid waste disposal sites, including the Old Fort Road site serving the urban area. Currently, sanitary landfill is practiced as much as possible at these locations.

There are three classes of solid waste: municipal, industrial and agricultural. In the Klamath Falls area, agricultural wastes are either recycled as fertilizers or treated as a special situation, i.e., pesticide containers, and pose little problem to the local landfill operation. The major industrial waste for this area is sawdust, for which industry has found several uses and it no longer poses a problem. Therefore, most of the solid waste in the urban area is municipal -- garbage, refuse, rubbish, scraps. The composition of the normal municipal solid waste is shown in the following chart.

#### Contents of a Typical City Dump Percentage by Weight

## Solid Waste - Current Conditions (2)

Each person in the urban area of Klamath Falls generates about 4.0 pounds of solid wastes per day. This gives a total daily generation in excess of 180,000 pounds and a yearly generation currently estimated at close to 33,000 tons.

The Old Fort Road site east of town covers approximately 80 acres. Solid waste is spread in thin layers, compacted to the smallest practical volume, and covered with soil for sanitary landfill. There has been some problem of soil depletion; the original 40-acre site lacked sufficient covering materials. However, the recent land increase, doubling the area, solved this shortage. Allowing for population expansion, this increased acreage should provide adequate space for waste disposal until about the year 2000.

Even though the site is fenced, wind-blown trash and dust present problems in the immediate area and along the access road there is un-slightly litter. Other problems of sanitary landfill include control of the surface water runoff and subsurface leaching; and the movement and dispersion of the gases generated in decomposition. These gases are predominately carbon dioxide, which is colorless and odorless and part of the normal atmosphere, and methane, which is odorless, colorless, and highly explosive in concentrations of from 5 to 15 percent in air. Methane, with the proper technology, may be a future source of energy.

One private company collects the solid waste from the urban area and transports it to the disposal site. Public use of this landfill, as well as several outlying pick-up sites, is encouraged.

While many items can be recycled or burned, the rubber tire had defied attempts at disposal. If covered, it works its way to the surface; if burned, it pollutes the air. Consequently, they are unacceptable as landfill. Instead, the tires are stored at a special site -- an old gravel pit (Harpold). Eventually, if shredding or some other type of disposal becomes feasible, they will be removed from the quarry.

In a recent survey, 82 percent of those surveyed endorsed recycling programs. However, Klamath Falls, because of its remoteness from most industrial sources, does not have any extensive recycling programs at this time. The beverage container return is, naturally, the most well-known

### Solid Waste - Current Conditions (3)

and widely practiced program in this area. The high costs of transportation restrict other recycling projects but there are two notable ones.

Each spring, for the past several years, Klamath County has franchised a private firm to haul away junk auto bodies. Also, some local firms buy various scrap metals for the purpose of recycling.

Paper and paper products constitute the largest percentage by weight of all solid wastes. Although there is no comprehensive paper recycling program in the area, local businesses save approximately 60 tons a month of corrugated cardboard which is collected and then pressed into bales by a hydraulic compressor-baler. The relatively small volume of paper products discarded, and the long shipping distances to market, make paper recycling a marginal business for private enterprise.



## Solid Waste - Problems (1)

- Distance to existing landfill can be long, especially for low-income and elderly citizens.
- Wind-entrained debris from landfill has adverse effects on surrounding lands.
- There is lack of an extensive recycling program.
- There is the possibility of contamination of surface and groundwaters due to runoff from and leaching through the landfill.
- There is a litter problem along major arteries leading to the landfill.
- There is little or no control on disposal of toxic or other potentially hazardous materials.
- Open air burning of trash is still occurring.
- There is a limited amount of sufficient land for landfill needs.
- Unauthorized fires occur that are difficult to extinguish and may burn unnoticed for periods of time after they are thought to be out.

D E T A I L E D   A S S E S S M E N T   N O T E

SUB-ELEMENT:      SOLID WASTE

THE CONTENT OF THIS SUB-ELEMENT IS SUPPLEMENTED BY THE FOLLOWING DETAILED ASSESSMENT WHICH WILL BE ADOPTED BY REFERENCE WITH THE COMPREHENSIVE PLAN.

KLAMATH COUNTY COMPREHENSIVE SOLID  
WASTE PLAN

COPIES OF THIS ASSESSMENT MAY BE AVAILABLE FROM THE ORIGINATING AGENCY OR CAN BE INSPECTED AT THE CITY PLANNING DEPARTMENT OFFICES.

### Solid Waste - Future Alternatives (1)

- Operation costs will increase.
- Landfills will suffer from land-related development pressures.
- Recycling may partially recover operation costs.
- Landfills may not continue to be feasible from cost view or legal view, and new solid waste disposal will be required such as incineration, compacting, or pyrolysis.

**Solid Waste - Goals**

- To provide a timely, orderly, and efficient arrangement of solid waste disposal facilities and services.

## Solid Waste - Policies (1)

- Recycling of materials should be promoted to help offset costs involved in maintaining facility.
- Compatibility between landfill sites and surrounding properties should be ensured.
- All waste and process discharges from future development, when combined with such discharges from existing developments, will not violate or threaten to violate applicable solid waste disposal regulations.
- The City should continue to explore methods of solid waste disposal that will provide a maximum recycling of materials at a minimal energy cost.
- The City should enforce and monitor current open trash burning ordinances and restrictions.

#### Solid Waste - Implementation Measures (1)

- Public education and involvement in the need for good solid waste disposal management and recycling should be supported.
- The City should support and coordinate with the County solid waste program.
- The City should apply for grants to promote the recycling of materials and develop alternate methods of solid waste disposal.
- The City should review, modify, and develop ordinances to prevent improper solid waste disposal, including littering, open burning of trash, et cetera.
- An ongoing monitoring program of surface and groundwaters around sanitary landfill should be supported to detect possible contamination from leaching.

Solid Waste - (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100)

M A P N O T E

**SUB-ELEMENT: SOLID WASTE**

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP DEPICTING THE FOLLOWING ITEMS:

**DISPOSAL SITES**

THIS MAP CURRENTLY EXISTS IN ROUGH DRAFT ONLY, AND IS NOT AVAILABLE FOR REPRODUCTION. HOWEVER, DRAFT COPIES ARE AVAILABLE FOR INSPECTION AT THE CITY PLANNING DEPARTMENT OFFICE.

PUBLIC HEALTH AND SAFETY  
SUB-ELEMENT

Public Health and Safety - History (1)

Law Enforcement

The earliest local law enforcement officer in the Klamath area was the county sheriff, hired when Linkville became a county seat in the early 1870's. In 1880, O. A. Sterns was appointed the first Justice of the Peace for the area. A jail was needed by 1884, and a small wooden building was built for detention purposes. When the County obtained its first official courthouse in 1888, a sturdier jail was constructed adjacent to it.

When the town of Linkville set up its local government in 1889, a town marshall was included in the organization to see that ordinances passes by the new officials were enforced. For several years, the city marshall and the county sheriff provided sufficient law enforcement; but after the incorporation of the City, and because of the large increase in population, a police force was set up late in 1908. It consisted of an appointed city marshall and a suitable police force. As the automobile made its impact on the community, traffic supervision became one of the force's major responsibilities. In February of 1927, the department obtained its first motorcycle for the traffic officer's use, and in the fall of 1927 a Buick was purchased for traffic control.

By the early 1940's, the force had approximately 30 men, mostly patrolmen, with several on duty in shifts around the clock, walking a beat uptown. The police station was part of City Hall, with the jail in the basement. The County had its own sheriff's department and had constructed a new jail in 1927 in conjunction with the new courthouse. In 1931, the State Police opened a station in Klamath Falls.

Statistics for local law enforcement are not readily available prior to 1962; however, the records for the past 16 years are on open file. Traffic fatalities within the City totaled 18 between 1962 and 1976, several years havine none, but 1964 and 1973 each show four. The total number of accidents over these 16 years range from 424 in 1972 to a high of 957 in 1975, the yearly average being 657; traffic citations issued over this period ranged from 1,689 in 1962 to 3,863 in 1974 and averaged 3,022. The arrests for criminal offenses for the 16-year period of 1962-1976 has



## Public Health and Safety - History (2)

ranged from 1,973 in 1972 to a high of 3,273 in 1966, with an average of 2,500 per year. These statistics are based on City Police records and do not include County Sheriff or State Police data.

### Fire Department

Fire protection in the days of Linkville and early Klamath Falls consisted primarily of a volunteer fire department. In 1892, a fire warden was appointed; what little fire fighting equipment had been accrued was placed in charge of the town marshall. The fires of 1889 and 1892 were devastating to the young town and several regulations were passed to try to reduce fire hazards. The City got its first fire bell in 1900 to alert volunteers for duty. The earliest records of the Fire Department are dated January 27, 1908, showing a highly organized volunteer department, with a waiting list of applicants for membership.

As streets were being improved in the early 1900's, fire hydrants were included in the plans, some 60 being installed by Klamath Falls Light and Water Company by 1910. About this same time, the Fire Department, through a City bond issue, bought some \$8,000 worth of new equipment, including a wagon rig and several hoses to use on the hydrants. The Fire Department's volunteer status continued until 1916, the group working out of the old City Hall.

When the new City Hall was constructed, it too included facilities to house the Fire Department and men. In 1916, a paid Fire Department was created and included a Fire Chief, an Assistant Fire Chief and 10 firemen. The new department obtained pumping and chemical fire fighting apparatus the same year. In 1922, the City purchased the area's first motorized fire truck, a 1923 Stutz Triple combination hose and pumping motor truck.

In 1931, the Central Fire Station was completed at the corner of Wall and Broad Streets. The building had many unique features and was said to be the only one of its kind in the country being heated by geothermal water. Two substations were constructed, #1 on Shasta Way in 1964 and #2 on Campus Drive in 1965. Following their completion, the City Fire Department employed 32 firemen and had a small batallion of volunteers, with five volunteers stationed at each substation.

### Public Health and Safety - History (3)

The per capita loss from fire was reduced from more than \$25 per year in 1930 to \$1.79 in 1931; property endangered by fire during 1931 totaled \$2 million, with a loss of \$28,700 paid by insurance. Records of calls from 1964, 1967, 1971, and 1976 show that, except for false alarms, which skyrocketed some 400 percent in 1976, the number of alarms has been quite stable from year to year. Fire alarms ranged from 289 to 367 over the 12-year period, rescue calls ranged from 14 to 26, and mutual aid between five and 11. Total calls were 412 in 1964, 367 in 1967, 389 in 1971, and 421 in 1976.

### Public Health

Several City ordinances have been passed over the years to help ensure health protection for the citizenry of Klamath Falls. There were some strict laws on sanitation passed in 1898, and in 1901 it became illegal for anyone with a communicable disease to enter the city. Anyone within the City suffering a contagious disease was quarantined.

The State Board of Health began collecting data in 1903 on contagious diseases, and old records show that Klamath County had five reported cases of smallpox and two of scarlet fever that year. The influenza pandemic of 1918 did not miss the Basin. Records show that over 400 people were stricken with influenza and over 100 died in Klamath County in the three-year period between 1918 and 1920, including all in a local Russian colony.

The City Board of Health was formed in 1921, consisting of the mayor, police chief and city health officer. The Board appointed a sanitary inspector, compiled a list of reportable diseases and required smallpox vaccinations for children entering school. The following year the Board set regulations for milk and cream standards. Many of the contagious diseases were conquered by vaccines and no longer make statistics climb; as an example, only four typhoid cases are on record over the past 15 years. However, infectious hepatitis has entered the list as an active disease. Records since 1951 show several periods of high case count for no apparent reason: 1952 saw two infectious hepatitis cases; 1953, 63 cases; and the 17 cases in 1973 jumped to 53 in 1974 and 59 in 1975.

Several organizations dealing with health and safety have been formed over the years. The Red Cross began a local chapter here on April 24, 1917,

## Public Health and Safety - History (4)

and in 1921 the Klamath County Public Health Association was started and was instrumental in making public health nursing part of the County services and assisting the City schools to obtain a full-time school nurse. The Klamath County Health Department was established in June 1936. In 1977 the City hired a health and safety officer to handle nuisance abatement.

### Medical Service

The first medical practitioner in the village of Linkville was a man named S. C. Sumner. He had no formal training, but had been a male nurse in the Civil War. During this time the area's first dentist, Dr. Boyd, and first pharmacist, W. A. Wright, settled here. In 1890, Dr. H. A. Wright began his practice here, and is considered the first reputable physician to practice in Linkville.

Klamath Falls got the first X-ray machine in the area in 1901, long before the first hospital started operating. For several years around the turn of the century, no hospital served the city. A small, ten-bed hospital, located on Fourth Street, was opened in 1919. Started by a nurse and considered to be the first hospital in Klamath, it was in operation for about one year.

In 1911, A. J. Lyle began building a medical facility at the corner of Eldorado and Esplanade, to be known as the Blackburn Hospital. In 1920, a second hospital known as the Klamath Valley Hospital began operation. In 1928 the Klamath General Hospital was consolidated with Klamath Valley hospital, serving the Basin until the opening of Presbyterian Intercommunity Hospital.

In 1924 Klamath Falls got its first ambulance, stationed at Klamath General. In 1928, the City and County voted to construct an isolation hospital which later became the County Infirmary for indigents, and, in 1959 became licensed as the County Nursing Home.

Another hospital that was begun in Klamath Falls during this growth period was the Hillside Hospital on Alameda, operated by Dr. Merryman, Sr., in 1930. This 60-bed facility served for about 30 years. It was closed prior to the opening of P. I. H.

## Public Health and Safety - History (5)

It appears that Klamath Falls was overendowed with medical facilities around the decade of the 1920's. A competition was keen during this period. Medical insurance had not yet become common and large organizations, such as the mills or the railroad, would contract with a doctor or group of doctors to provide medical care for their employees and staff. Hence, rather than a cooperative facility to serve the entire populace, individual units were formed, each competing to obtain contracts with the various companies.

The population of the Klamath Basin grew and the existing hospitals became insufficient. In 1964 Presbyterian Intercommunity Hospital opened to provide the latest advancements in medical treatment to the entire area. During its first decade of service, over 74,000 patients were admitted, and 280,000 people were treated as out-patients. In the mid-1970's extensive construction expanded the facilities to meet the needs of Klamath County citizens.

Originally the only public facility to care for the aged was auxiliary medical service in the form of nursing homes. In the mid- and late-1960's, nursing homes were increased as needed. Ponderosa was opened in 1966 as a convalescent center and three years later Washburn Manor came into existence. In 1977 a new County Nursing Home was opened adjacent to Presbyterian Intercommunity Hospital; the medical complex provides modern care for the infirm.

## Public Health and Safety - Current Conditions (1)

Law Enforcement

The Klamath Falls urban area is served by three law enforcement agencies. Within the City proper is the City Police Department; county-wide is the Sheriff's Department; and Klamath County forms a portion of District Three of the Oregon State Police.

The Klamath Falls City Police Department has a staff of 18 patrol officers, three patrol sergeants, one identification sergeant, one juvenile sergeant, two detective sergeants, three administrators, three clerks and five dispatchers, supplemented by a cadet corps of youth which help handle non-enforcement activities. Continued education and upgrading of skills is an ongoing program and a total of 4,256 man-hours were spent by members of the police force in various types of training during the past year.

In addition to enforcement activities, the Klamath Falls Police Department also promotes prevention of crime. The major effort of the prevention program has been to reduce burglary, which has been the City's greatest crime problem. The campaign provided the public with information that would help them to become less vulnerable.

When reported offenses of 1976 are compared to those of 1977, burglary decreased from 432 to 301 -- a decrease of 30.3 percent; larceny reports also decreased from 980 in 1976 to 941 in 1977, a decline of four percent; robbery reports increased from 13 to 21, an increase of 61 percent; rape from 9 to 10, and increase of 10 percent. However, by using 27 indications (traffic citations not included) it can be seen that the reports of all offenses decreased from 4,882 to 4,115 -- a drop of 15 percent. The total number of arrests did not change significantly -- 2,343 in 1976 as compared with 2,340 in 1977. A rise is noted in the number of juveniles charged: 371 in 1966 and 463 in 1977 showing an increase of 24.7 percent. The Klamath County Jail facilities are utilized as the need arises. The following table gives a brief outlines of the investigations handled by the City Police Department in 1977.

## Public Health and Safety - Current Conditions (2)

## Miscellaneous Reports Investigated by the Police

Traffic accidents	906
Other accidents	4
Suicides/attempts	25
Sick or injured persons	112
Missing persons	262
Prowlers	63
Suspicious persons/incidents	182
Domestic trouble	81
Vandalism/criminal mischief	552
Lost and found	349
Impounded and abandoned vehicles	268
Outside assist	450
Found deceased	19
Civilian aid	405
Bicycle theft	71
Miscellaneous complaints	283
Discharging firearms in City limits	5
Violation of City ordinance and leash law	292
Harassment	141
Mental hold	18
Other miscellaneous	698

## Miscellaneous Services\*

Vacation house checks	5,462
Miscellaneous civilian aid	98
Bank checks	3
Visiting groups	19
Street lights reported to be out	84
Fires covered	46
Street signs down	71
Open doors and windows reported	44
Night and safe lights out	6
Burglary alarms checked and answered	1,067
Other miscellaneous	192

\*Not counted in log entries

The Sheriff's Department has jurisdiction within the boundaries of the County. It is staffed by one sheriff, one chief deputy, one captain and 13 deputies as patrol personnel; four deputies and two clerks in the Civil Division, 11 officers and three supporting staff in the Corrections Division (jail); and 7 office staff, which includes an administrative secretary, and 6 records clerks/dispatchers, one serving as chief.

The Oregon State Police District Three has a patrol station in Klamath Falls. It is staffed by 39 patrol officers, four clerks and five administrators, including the station commander who carries the rank of lieutenant.

## Public Health and Safety - Current Conditions (3)

Fire Department

The Klamath Falls Fire Department consists of a Central Station and two substations. The fire chief, fire marshall, and a clerk are at Central Station. All stations are manned 24-hours a day by three 24-hour shifts; the total personnel for each shift includes a battalion chief, two captains, four drivers and up to four hosemen. The Department has five fire engines, one aerial platform truck, a pumper-tanker truck, and numerous pieces of specialized equipment.

During 1977 fires endangered property values at approximately \$6.5 million, but only \$453,616 worth of property was lost to fire. The following table shows a breakdown of the alarms received during the past year.

Responses by Station	
Central Station	231
Substation #1	88
Substation #2	<u>146</u>
Total	465
Total Alarms Received	
Fire alarms (dwellings)	54
Fire alarms (other structures)	15
Gas washdowns	47
False alarms	71
Rescue unit	18
Trash and grass	100
Auto fires	33
Electrical alarms	8
Mutual aid	4
Miscellaneous alarms	97
Alarm scares	<u>18</u>
Total	465

To aid in fire prevention, the Department inspected some 975 structures, from storage units through residences, commercial and industrial facilities to public and private institutions; also public and private alarm systems have been expanded.

A major accomplishment during last year was the change in insurance rating from Class 5 to Class 4 within the City. It took several years of work to reach this goal and the change went into effect on March 14, 1977, following an evaluation by the Oregon Insurance Services.

## Public Health and Safety - Current Conditions (4)

### Klamath County Department of Health Services

The Department of Health Services consists of Public Health, Environmental Health, Mental Health, and Medical Examiner Divisions. Public Health provides a wide variety of services: communicable disease control, venereal disease control, tuberculosis control, the Home Health Agency (intermittent skilled nursing care to homebound patients at the orders of private physicians), and various clinics and laboratories. Nursing consultation is available in homes, at the Department and at schools and clinics. Services are provided at specific times and in several instances there is a fee charged; however, no one is refused service because of inability to pay.

The Department is staffed with 25 personnel. This includes three medical doctors who work on a part-time basis in the capacities of Health Officer, Family Planning Physician, and Medical Examiner; 11 registered nurses, three sanitarians, one environmental technician, and six office staff (plus the mental health staff).

The principal task of the Environmental Health Program is to inspect restaurants, vending and mobile units, commissaries; examination of public water supplies, schools, nursing homes, foster homes, motels, hotels, mobile home parks, parks and camps, swimming pools, day care centers; and investigate nuisance complaints.

There is one sanitarian and two trainees in the Department, serving both the City and the County.

The Mental Health Center provides services to all City and County residents. Its goal is to help individuals learn and experience techniques to deal more effectively with such problems as stress, family trials, or marital disharmony.

### Hospital Facilities

Presbyterian Intercommunity Hospital, located at the north end of the city, has an extensive service area which includes portions of northern California. The hospitals nearest to Klamath Falls are in Bend (140 miles north), Lakeview (100 miles east), Redding, California (140 miles south), and Medford (75 miles across the Cascades to the west).



## Public Health and Safety - Current Conditions (5)

The present 203-bed capacity of the hospital is as follows: pediatrics, 14; obstetrics, 15; general medicine, 65; women's surgery, 16 (not currently in operation); general surgery, 36; orthopedic/neurosurgical, 32; critical care, 15; and mental health, 10.

The hospital provides all the major range of services including radiology, pathology, and nuclear medicine. Cardiopulmonary services include electrocardiography, electroencephalography, inhalation therapy, pulmonary function and stress testing. Surgical facilities include general, thoracic, neurological, orthopedic, urologic and dental capabilities. The Critical Care Unit offers the latest in monitoring devices including telemonitoring; and with over 1,000 births a year, the hospital has services for fetal monitoring and initial care for premature babies. The emergency services include a fully staffed department with 24-hour physician coverage.

The medical staff of P. I. H. consists of over 60 doctors covering the following specialties: allergy, anesthesiology, dermatology, emergency medicine, family practice, general surgery, gynecology, internal medicine, neurological surgery, neurology, nuclear medicine, obstetrics, ophthalmology, oral surgery, orthopedic surgery, otolaryngology, pathology, pediatrics, psychiatry, public health, radiology, thoracic surgery, urology and vascular surgery. In addition to the medical doctors, there is also a dental staff of 23 who have an affiliation with the hospital.

Three nursing homes are located in the urban area. The Klamath County Nursing Home is adjacent to the hospital and has a 120-bed capacity. Two private facilities, Ponderosa and Washburn Manor, have space for 92 and 114 patients respectively. These facilities generally are nearly or completely filled.

Other health-related resources in addition to those already mentioned include an ambulance service, a dispensary at O. I. T. and one at Kingsley Air Force Base, three medical laboratories, seven optometrists and one optician, four chiropractors and eight pharmacies. There is a laboratory for biological and chemical water testing.

Public Health and Safety - Current Conditions (2)

Emergency Services - The out of state services provided to citizens are provided through the Emergency Services Center which is headquartered in the Courthouse. Its prime objective is to coordinate all planning for disaster. The primary responsibility was to coordinate the unit to handle nuclear disaster. It also has a secondary mission the handling of any natural disaster. Evacuation procedures and fall-out shelter locations are kept up-to-date and communication via several methods is kept at readiness.

Inventory of supplies - The inventory of supplies, food, and emergency supplies on a smaller scale, such as food, clothing and/or shelter for an individual or family are available through several agencies. These include:

- (This page inadvertently left blank)
- the Salvation Army, and the Gospel Mission.
- Fire and rescue services is primarily a function of the Sheriff's Department. However, several agencies and groups are available for assistance: the Kiwanis Club, Mountain Search and Rescue, Kiwanis Basin Motorcycle Club, U. S. Department of Forestry; several private rescue divers; two four-wheel-drive organizations; one mountain climbing group; two snowmobile clubs; two citizens band radio groups (1-80 and Night Riders); Kiwanis Air Search and Rescue; Kiwanis Basin Motorcycle Association; Kiwanis Civil Air Patrol; and Kiwanis Basin Amateur Radio Association.

## Public Health and Safety - Current Conditions (6)

Emergency Services

Klamath County has an Emergency Services Operations Center which is headquartered in the Courthouse. Its prime directive is to coordinate all planning for disasters. Its original formation was as a Civil Defense unit to handle nuclear disasters; it now has as a secondary mission the handling of any natural disaster. Evacuation procedures and fall-out shelter locations are kept up-to-date and communication via several methods is kept at readiness.

There is a local chapter of the American Red Cross, and emergency services on a smaller scale, such as food, clothing and/or shelter for an individual or family are available through several agencies. These include, but are not limited to, Volunteer Services (Department of Human Resources), the Salvation Army, and the Gospel Mission.

Search and rescue service is primarily a function of the Sheriff's Department. However, several agencies and groups are available in case of emergency: the Klamath County Mounted Sheriff's Posse; State of Oregon Department of Forestry; U. S. Department of Forestry; several private scuba divers; two four-wheel-drive organizations; one mountain climbing group; two snowmobile clubs; two citizens band radio groups (I-80 and Highlanders); Klamath Air Search and Rescue; Klamath Basin Motorcycle Association; Klamath Civil Air Patrol; and Klamath Basin Amateur Radio Association.

Public Health and Safety - Problems (1)

- Speeding on neighborhood collector streets is the most common traffic safety hazard reported by residents.
- Fire Department response times for outlying parts of the City are not acceptable for effective protection.
- A large number of wild animals (skunks, rodents, small mammals) create a potential health problem.
- Older parts of town with narrow, poorly maintained streets create a traffic hazard and potential problem.
- Low water pressure and/or a lack of fire hydrants create fire fighting problems.
- Certain noxious weeds present in the City can cause serious illness if taken internally, and should be eliminated wherever possible.

## Public Health and Safety - Future Alternatives (1)

- Fire and crime insurance costs will increase.
- Crime will probably increase in proportion to population increase, especially in high-density areas.
- Fire and police service and operation costs will increase and there will be an increased demand for these services.
- Public health services will have a greater demand plus rising costs of those services.
- As the number of aged increases, so too will demands for proper care.
- Klamath County and the City of Klamath Falls should identify and work to correct health and safety hazards within the planning area.
- City and County governments may work together toward a new, consolidated jail.
- Police training costs will continue to increase.

**Public Health and Safety - Goals (1)**

- To provide a timely, orderly, and efficient arrangement of safety and health facilities and services.

## Public Health and Safety - Policies (1)

- The City will continue to resist increases in crime rates through appropriate improvements in police services.
- The City will maintain or improve its Class 4 fire rating with appropriate improvements in fire services.
- New developments will be closely evaluated in terms of fire and police response times, and physical design criteria that enhance delivery of police and fire services.
- The City will continue to monitor general conditions of public health, and to immediately react to any serious health hazard threat.
- Reduced crime potential will be promoted through design and location of buildings on the principles of defensible space.
- Adequate water pressure for required fire flow should be maintained through the water system.
- Emergency vehicle access, including ambulance, fire, police, and disaster services, will be a principal criterion in evaluating overall street plans.
- The City should support and coordinate with County Health Department, P. I. H., County Emergency Services, and private ambulance companies to ensure adequate and effective emergency medical capabilities.
- The City should support and assist the County Vector Control group in maintaining adequate control of nuisance insects.
- The City should promote cleanliness on properties, including weed control and refuse disposal.

Public Health and Safety - Implementation Measures (1)

- Public education and involvement in the needs for adequate public safety planning should be supported.
- Police and fire review of all development proposals should be provided for adequate response times, road or plan layout on other public safety needs.
- A detailed capital improvement program for police and fire protection should be developed.
- The City should apply for grants to improve the public safety units of the community.
- The City should coordinate fire and police service with surrounding State and County services.
- The City should coordinate and support public health services with the State and County.
- The City should conduct an aggressive nuisance abatement program, including weed control and refuse disposal.





## COMMUNICATIONS SUB-ELEMENT

## Communications - History (1)

Postal Facilities

The first step the new town of Linkville took in keeping in touch with the rest of the world was to establish a post office. This was sometime in 1871 or 1872, with George Nurse as the Post Master and the post office in the Nurse Hotel.

The frequency and reliability of delivery improved when, in the spring of 1872, the government granted a mail route into the area and a contract for carrying mail was let. The route was from Ashland to Lake City, California, via Linkville. The post office grew along with the town, providing, at first, weekly mail service to Ashland in 1884 and daily service by the end of 1882.

In 1903 the Klamath Falls Post Office was elevated from a third class to a second class facility. Parcel Post service began in 1913, and the first City delivery of mail began October 10, 1916. Rural service to suburban areas was established on a tri-weekly basis February 1, 1918, and expanded to a six-day-a-week service in May, 1920. During that year, the post office was moved to new quarters on Main and Tenth Streets. Rural Route 2 was established in 1928, and Rural Route 3 was set up in 1937.

In 1931, the post office moved into the structure on Seventh Street, where it has remained, sharing the upper stories of the building with several government agencies. Its second class rating was upgraded to first class in 1935. The first air mail letter was posted in 1938, but regular air mail did not begin until 1946.

Telephone and Telegraph

In 1881 a more rapid form of communication connected the Basin to the other side of the mountains, when Western Union telegraph lines joined Ashland with Fort Klamath via Linkville. The first local telegraph office was situated in the Linkville Hotel.

Another general device for communication, the telephone, made its debut in Klamath in 1901, when three instruments were installed to connect Baldwin's store and house with the electric power house. Within the following year, telephone lines ran from Ashland to Klamath Falls and the City had its telephone system.

## Communications - History (2)

### Newspapers

To keep the Basin's residents abreast of what was happening locally and around the world, the *Linkville Star* printed its first issue in 1884. Other newspapers were born over the years, including the *Klamath Republican* (1896), the *Evening Herald* (1906), and the *Morning Express* (1907).

As can be seen, numerous newspapers were born, consolidated, changed hands, renamed and closed over the years. In 1920 there were two dailies, the *Herald* and the *Record*. The *Klamath News* began publication in 1923; after 1927, it was printed in the same building as the *Herald* and they eventually consolidated in 1942 into the single *Herald and News*.

### Radio and Television

By the mid-1920's radio broadcasts from the local station began providing news and entertainment for the people of the Klamath Basin. The first station was K-FJI which began broadcasting in 1923 and was later to become K-AGO. This was followed in 1948 by K-FLW (now K-FLS) and by K-LAD in 1955. The first television was brought to the city by cable in the mid-1950's, and Klamath's own television station, K-OTI, began transmitting from a location on the old O. I. T. campus in 1957.

## Communications - Current Conditions (1)

### Postal Service

The Klamath Falls Post Office has served this area for over one hundred years. It ranks as a first class post office and serves as the sectional center for sixteen associate post offices. Contract stations also serve the urban area to make the postal service available to more urban citizens; one major substation is on the O. I. T. campus.

The Klamath Falls Post Office has 29 carrier routes: 21 urban, six rural and two box deliveries. These routes serve some 18,397 families and businesses which send and receive approximately 150,000 pieces of mail daily. On the average, 3.5 million pieces go through the post office each month, except in December when the amount about doubles.

### Telephone Service

Telephone service in Klamath Falls is provided by Pacific Northwest Bell Telephone Company. It offers a wide range of long distance and local services for home and business. There are currently over 15,300 residential and more than 2,000 business telephone hook-ups in the area, and expansion continues as the area grows.

Upgrading of the area's telephone system will be completed sometime early in 1980 when a new Electronic Switching System (ESS) will go into use. This ESS will provide Klamath Falls with the latest advancements in telephone technology and services, including Centrex and such features as call forwarding and three-way calling. Pacific Northwest Bell attempts, through accurate and continuing forecasting of future needs, to provide the Basin with more than the normal requirements of prompt and adequate telephone service.

### Newspapers

The *Herald and News* is a regional publication serving the four-county area of Siskiyou, Modoc, Lake and Klamath Counties. Published six days a week, Sunday through Friday, it has a daily circulation exceeding 18,000 and a Sunday dissemination of over 19,000. The *Herald and News* is continually increasing both its circulation and size: paid subscriptions have increased about five percent a year over the past three years; the physical volume of the paper is averaging from 75 to 100 pages more per month than a year ago.

## Communications - Current Conditions (2)

Radio

Three radio stations, offering five broadcasts (three AM and two FM) serve Klamath Falls. All three are members of the Emergency Broadcasting System and their statistics are as follows.

Call letters	K-AGO	K-FLS	K-LAD
AM frequency	1150	1450	960
FM frequency	98.5	None	92.5
Power output	5,000 watts	1,000 watts	5,000 watts
Reception range	150 miles	Unknown	75 miles
Broadcast hours	5:30 A.M.- 2 A.M.	5:55 A.M. - 10:05 P.M.	6 A.M. - midnight
Power generation capacity	Secondary	None	None
Network affiliation	Independent	CBS	Independent

Two of the stations, K-AGO and K-LAD have protection against radiation and K-AGO facilities include a bomb shelter.

There is one small educational station associated with Oregon Institute of Technology. K-TEC is an FM station operating at a frequency of 88.1, with a very limited reception range.

Television

Klamath Falls has one local television station, K-OTI. The station is a member of the Emergency Broadcasting System. Its frequency is Channel 2, with a power output of 13,000 watts. The reception area is 40 miles with translators at Alturas, Lakeview, and Chiloquin.

Communications - Problems (1)

- Cost for some communications services restricts availability to low-income people; however, communication companies are planning to develop specific program to address this problem.

Communications - Future Alternatives (1)

- Communications costs will continue to increase.
- Expansion in the communications fields will be needed within ten years to accommodate population increases.
- Cable television will become a major private and personal communication system for the citizen.

Communications - Goals (1)

- To provide a timely, orderly, and efficient arrangement of communication facilities and services.



Communications - Policies (1)

- The City will monitor all planning and decision-making processes in consideration of communication impacts, and continually strive toward an effective communications system for the community.
- Community land use planning should be coordinated with communication agencies to assure the availability of services when needed.

Communications - Implementation Measures (1)

- The City should support and cooperate with public utilities and private enterprises engaged in communications.



LAND USE SUB-ELEMENT

Land Use - History (T)

The Link River was long back the hub of the Clarno Basin. Before the pioneers arrived, the Indians called on its shores and fished on its flats. George Hunt became the first permanent settler, establishing a pathway of running a ferry across the river in 1807, and building the first cabin on a rocky point of the eastern river bank.

COMMUNITY DEVELOPEMENT ELEMENT

after the arrival. The townsite comprised 90 blocks, stretching east and west from the river to the hills. The town site was laid out in 1811.

INCLUDING THE FOLLOWING SUB-ELEMENTS:

The first plat map recorded in 1835 was the Nichols addition.

Likelihood's first decade saw the establishment of several commercial enterprises, in addition to Hunt's store and hotel, which included a carpenter's shop, blacksmith and tannery, as well as a saloon. By the end of the 1830's Likelihood could boast a blacksmith shop, three hotels, three blacksmith shops, a brewery, three lively stables, a harness shop, a butcher shop, and three saloons. The early industries were linked to the available water and Likelihood's first sawmill was constructed on the west side of the river in 1817. Other major industries were a flour mill built about 1825 on the west bank and a tannery and boot factory.

LAND USES

URBANIZATION

LIVABILITY

The population of the town had grown to nearly 400 during the 1830's, the more prosperous of which lived along the river shore. North from the school building at Third Street was "Fever's Flats", and between the two streets Main Street, eventually to become a busy commercial street.

With the advent of the great Irrigation project of 1895-00, agriculture became a primary land use in the basin and with the new influx of people, the town, now named Clarno Falls, began to grow rapidly. Burned down, that section along the east side of the river and lower edge of the hill, was platted and recorded in 1900, appearing to be a commercial and market center, and Main Street, now, was housing wide boulevard. South Third Street was designated to join the downtown area to the east of the Main Street in the 1920's.

The arrival of the railroad in 1916 changed the direction of the growth again. The depot was built south and west of the upper town center and



## LAND USE SUB-ELEMENT

## Land Use - History (1)

The Link River has long been the hub of the Klamath Basin. Before the pioneers arrived, the Indians camped on its shores and feasted on its fish. George Nurse became the first permanent settler, establishing a business of running a ferry across the river in 1867, and building the first store on a rocky point of the eastern river bank.

The town of Linkville was originally platted by George Nurse shortly after his arrival. The townsite comprised 40 blocks, stretching east and west from the river to Ninth Street. The town spread across the river within two or three years and West Linkville was platted and recorded in 1880. The next plat made and recorded in 1885 was the Nichols Addition.

Linkville's first decade saw the establishment of several commercial enterprises, in addition to Nurse's store and hotel, and included a carpenter's shop, blacksmithy and livery stable, as well as a saloon. By the end of the 1880's Linkville could boast of having seven stores, three hotels, three blacksmith shops, a brewery, three livery stables, a harness shop, a butcher shop, and three saloons. The early industries were close to the available water and Linkville's first sawmill was constructed on the west side of the river in 1877. Other major industries were a flour mill built about 1885 on the west bank and a sash and door factory.

The population of the town had grown to nearly 400 during the 1880's, the more prosperous of which lived along the lake shore. North from the school building at Tenth Street was "Poverty Flats", and between the two stretched Main Street, eventually to become highly commercialized.

With the advent of the great irrigation project of 1905-06, agriculture became a primary land use in the Basin and, with the new influx of people, the town, now named Klamath Falls, began to grow rapidly. Buena Vista, that section along the east side of the river and lower edge of the lake, was platted and recorded in 1906, continuing to be a commercial and social center, and Main Street, too, was housing more businesses. South Sixth Street was lengthened to join the downtown area to the settlement of Altamont to the south.

The arrival of the railroad in 1909 changed the direction of the town's growth. The depots were built south and east of the population center and

## Land Use - History (2)

eventually, coupled with the rapid increase in automobile traffic, pulled commerce away from the water front. The commercial enterprises which utilized railroad transport soon began building near the depots and that area became largely industrial.

Residential land promoters came into full swing in this period. Buena Vista, although commerce was declining, still remained a popular residential area. The year 1910 saw several other residential sections made part of the City -- Lakeview Addition, the Nichols Addition, and the Hillside Addition.

The lumber industry had continued to grow and the railroad's arrival gave it a boost. Many mills still enjoyed the ease of water transportation and they dotted the shore line from Fort Klamath to Keno. Others sprang up near rail lines, and areas along South Sixth Street encouraged industry to move. The Railroad Addition became part of the City in 1910, and this area adjacent to the depots became a conglomeration of industry, businesses and residences.

Klamath Falls expanded considerably during the 1920's when railroad development reached its peak. Little thought had been given to planning the use of the land, and industry, businesses and residences popped up everywhere. This blending caused conflict between use, high cost for development, and bad traffic flows. One conflict was the gridiron street pattern, common at the time, which worked fairly well for commercial areas but proved detrimental to residential sections because it encouraged traffic rather than discouraged it, and the straight-line square pattern ignored the local topography.

The first zoning ordinance passed in Klamath Falls in 1930 set restrictions on land use within the City limits. It was amended in 1931, and replaced by a new ordinance in 1940, which was upgraded in 1948 and 1959. A planning commission to review plans for improvements or changes to any public properties was formed in 1934.

The urban area continued to spread with several small developments forming individual sub-communities, such as Pelican City, Altamont, Wocus, and Stewart-Lennox. The swamp along South Sixth Street continued to develop commercially, with the shopping center beginning with the "Town & Country"

### Land Use - History (3)

complex was built. In more recent years the Shasta Plaza Shopping Center has drawn commercial trade from downtown into the suburbs. Such developments as Sunset Village, Gatewood, and Ferndale have changed the farmlands to residential areas.

In 1967 a joint City-County Planning Office was set up, giving local control of planning. This joint office was eventually dissolved and the City and County each developed its own land use planning program.



## Land Use - Current Conditions (1)

The manner in which land has been used in the United States can serve as a comparison for the use of land in the Klamath Basin. With an area of almost 3.5 million square miles (9.16 million square kilometers) and a 1975 population of 215 million, the U. S. has an average population density slightly less than that of the world as a whole -- about 62 people per square mile for the U. S. and 72 people per square mile for the world.

Ownership of land in the U. S. is divided in the following manner. The Federal government holds more than one third of the total. Most of the Federal land is grazing land and forest, controlled by the Bureau of Land Management in the Department of the Interior and by the U. S. Forest Service in the Department of Agriculture. Private individuals or groups own about 60 percent of the total; the original occupants of the territory now comprising the U. S. -- tribes of American Indians -- control about two percent.

The uses of land in the U. S. in 1970 are summarized below.

Use	Land Area (million hectares)	Percentage of Total
Pasture and rangeland	360	39.3
Ungrazed forest	192	20.9
Cropland	155	16.9
Desert, swamp, barren tundra (limited use)	110	12.0
Urban and transportation	27	2.9
Military	12	1.3
National wildlife refuges	12	1.3
National parks	12	1.3
Farm buildings and farm roads	11	1.2
Withdrawn from other uses by surface mining	2	0.2
Transmission line rights-of-way	1	0.1
Other	24	2.6

NOTE: The table, which includes Alaska and Hawaii, does not include lakes and reservoirs.

SOURCES: United States Department of Commerce, *Statistical Abstract of the United States*, 1974, p. 600; National Commission on Materials Policy, *Material needs and the environment today and tomorrow*, chapter 7.

Urban and transportation uses of the U. S. territory appear rather minor as they involve less than three percent of the total land area, but

## Land Use - Current Conditions (2)

it should be noted that many expanding urban centers are located in the midst of or adjacent to the best agricultural lands. It has been estimated that between 1958 and 1974, urbanization has taken 12.6 million acres of arable (agricultural) land.

The separation of farm lands and urban land would be much easier if each had its own particular characteristics. However, agricultural land is usually the easiest to build on. Geological features generally prevent construction of shopping, commercial, and industrial centers on other than fairly level ground. That same land is the most suitable for farming.

Homes, on the other hand, can be built on slopes of up to 30 percent, although a slope of more than 20 percent severely limits the "normal" urbanization. Another factor which must also be taken into consideration is the type of soil; even a 12 percent slope can result in land slumpage if the soil is substantially clay or has a high water table or poor permeability.

A land use breakdown in 1970 for the Klamath Basin shows 70 percent in forest lands, 17 percent rangelands, eight percent croplands, and five percent in other land uses. Much of this land is publically owned (Federal and State); in fact, 55 percent of Klamath County lands are publically owned. The large percentage of forest lands in the Basin accounts for lumber and wood products being a major economic force in the area. Commercial forests consist of 2.6 million acres (68 percent of forest lands) and contain approximately 20.8 million board feet of lumber.

The boundary of the City of Klamath Falls encloses an area of 11.86 square miles (7,520 acres) with a population of 17,285 or a density of 1,457 people per square mile. This density has decreased from a 1970 density of about 2,500 persons per square mile due largely to the annexation of 1,600 acres of unpopulated forest land since 1970. The land consumption rate in acres per person in the U. S. rose from 0.2 acres in 1950 to 0.4 acres per person in 1970. This is somewhat lower than the land consumption figure of 0.45 acres per person seen in Klamath Falls.

Within the City limits approximately 60 percent of the land is developed. Of the undeveloped land, 51.7 percent is the previously mentioned 1,600 acres of forest land. Overall, about 20 percent of the land inside the City is vacant; thus within the City limits, there is 1,600 acres of

## Land Use - Current Conditions (3)

forest, 200 acres of agricultural land and 350 acres of industrial land. However, not all vacant land can be developed.

The updated land use inventory as of May 1978, shows these statistics (the land occupied by roads, railroads and rivers is not included):

Land Use Inventory			
	Use	Acres	
	Low-density residential	187.10	
	High-density residential	99.87	
	Commercial	271.43	
	Industrial	213.03	
	Public	1,413.25	
	Vacant	3,524.76	
Zones	Developed Total Acres	Vacant Buildable Total Acres	Vacant Non-Buildable Total Acres
R-7.5	364.92	641.58	131.00
R-6	530.32	55.88	6.90
R-5	833.11	257.69	24.90
R-5A	364.38	9.66	4.00
Marine	5.50	10.66	10.60
C-1	15.34	3.16	0.00
C-2	189.29	3.12	1,083.60
C-3	125.59	2.51	0.00
M-1	137.22	20.38	0.00
M-2	0.00	452.21	0.00
PUD	176.64	279.15	0.00

The total land area of the city (11.86 square miles) can thus be broken down by current zoning classifications as residential uses (R-7.5, 6, 5, and 5A) taking up 45 percent; commercial (C-1, 2, and 3), 18 percent; Planned Unit Development, three percent; industrial (M-1 and 2), 10 percent; and others (marine, lake, river, et cetera), five percent.

In the residential area, 2,092.7 acres are developed and 964.9 acres are vacant and buildable. A general survey shows that 75 percent of the residential single-family homes are in a grid pattern; the rest are in either a cluster or contoured pattern.

A survey in 1977 revealed that of the total units for housing (6,968), 66.7 percent were single-family units (4,716), 2.48 percent were high-density apartments (1,750), 6.1 percent duplexes (430), 1.9 percent four-plexes (136) and 0.5 percent were triplexes (36).

#### Land Use - Current Conditions (4)

The land zoned for commercial use (C-1, 2, and 3) covers 1,426 acres; however, within this acreage are 1,087 acres of forest land with no available services. Thus, the actual usable commercial land is 339 acres, or 4.4 percent of the total land value. This percentage is comparable with the percentages in typical Oregon communities outside the large metropolitan areas which show four percent of total land as commercial.

Of the commercially-zoned and available land (339 acres) most (94.6 percent -- 330 acres) is already developed in Klamath Falls; the remaining 2.6 percent (nine acres) is vacant and buildable.

Industrially-zoned lands (M-1 and 2) within the City limits of Klamath Falls account for 10.3 percent of the total land area. This percentage is very similar to the average (11 percent) land used by industry in Oregon communities outside of the major metropolitan areas. Of the land zoned for industrial use in Klamath Falls, approximately 22.5 percent is developed, 77.5 percent is undeveloped. This large area of undeveloped land is due to the presence of two large parcels of industrial-zoned land being present within the unpopulated forest lands of the city.

Other designations for land areas within the City limits are the public facilities and services land category and the "others" category. The public facilities and services land includes schools, parks, government buildings, hospitals, churches, and golf courses which usually accounts for about one fifth of the total developed land area in an average Oregon city. In Klamath Falls the public lands and services area consists of approximately 1,413 acres or about 19 percent of the total land area. This includes 488 acres of recreational areas within the City limits. The "others" category which includes the marine-zoned land, rivers, lakes, canals, et cetera, accounts for approximately five percent of the total land area of the city.

These various figures on land use within the city can then be compared to adjusted and weighted land use figures which use a 4.44 persons per acre density figure. The total land acreage for urban use is 52 percent for mixed residential use, 18 percent for streets and roads, 15 percent for schools, recreational and public services, and 15 percent for industry and business.

## Land Use - Problems (1)

- Lot patterns and sizes within most of the city have been established by previous development.
- Future development areas within existing City boundaries are scattered and of relatively small size.
- Lower densities cost more in terms of public services.
- Higher densities of development may reduce air pollution to the extent it reduces auto trips.
- Higher density developments are more cost-effective, have lower energy use, and reduce the cost for public services.
- Many vacant blocks of land are being held for investment or retirement income which means long term vacancy.
- There is a lack of available commercial or industrial lands in the city.
- Citizens of the area prefer large amounts of single residence, low-density zoning rather than multiple.
- The lack of planning for commercial, industrial, and residential development has led to conflicting land use.
- A lack of public amenities, such as parks and open space, has occurred in some new developments.
- Urban sprawl is encouraged by low-density development.
- Some industrial activity is incompatible with abutting land uses.
- Strip (linear) commercial activity is not desirable in the community.

D E T A I L E D   A S S E S S M E N T   N O T E

SUB-ELEMENT:      LAND USE

THE CONTENT OF THIS SUB-ELEMENT IS SUPPLEMENTED BY THE FOLLOWING DETAILED ASSESSMENT WHICH WILL BE ADOPTED BY REFERENCE WITH THE COMPREHENSIVE PLAN.

CITY OF KLAMATH FALLS MONTHLY LAND USE  
INVENTORY REPORT

COPIES OF THIS ASSESSMENT MAY BE AVAILABLE FORM THE ORIGINATING AGENCY OR CAN BE INSPECTED AT THE CITY PLANNING DEPARTMENT OFFICES.

#### Land Use - Future Alternatives (1)

- Greater diversity and variety of land uses should be encouraged.
- Residential land uses may become denser.
- Greater pressure for centralized commercial and job sites may develop  
in response to energy and transportation conservation efforts.
- Overall there will be greater restrictions in private use of lands.

### Land Use - Goals (1)

- To establish a land use planning process and policy framework as a basis for all decisions and actions related to use of land and to assure an adequate factual base for such decisions and actions.
- To preserve and maintain agricultural lands.
- To conserve forest lands for forest uses.



## Land Use - Policies (1)

- Land uses which have conflicting impacts on natural resources should be buffered from such resources whenever possible.
- General business districts should receive top priority consideration for commercial centers supplementing, not detracting from general business districts or conflicting with surrounding residential areas.
- Strip commercialism should be avoided, with its adverse effects on traffic, energy, safety, and convenience.
- Core area residential densities should be as high as practical for energy and transportation advantages.
- Densities adjacent to major arterials should be increased.
- Residential densities will be based on:
  - low - up to five units per net acre;
  - medium - between six and 14 units per net acre;
  - high - between 15 and 35 units per acre.
- The density of residential land uses will be based upon the net land area of the site in conformance with the foregoing density ranges.
- Industrial sites should be designated in consideration of prevailing wind patterns and subsequent potential for wind-entrained particulate or odor problems.
- Areas within identified floodplains should be limited to agriculture, forestry, parks, recreation, open space, and limited storage uses, unless adequate safeguards are provided to protect life and property involved in other uses.
- The Comprehensive Plan will guide all decisions on proposed land uses within the Urban Growth Boundary.
- Land development will be in a systematic manner which contributes to the efficiency and quality of its use and the livability of the community.

## Land Use - Policies (2)

- The preservation of significant natural features and open areas will be a major emphasis in land use planning.
- The appropriate reuse of land which is underdeveloped or where structures are deteriorating will be encouraged.
- Standards for urbanization should encourage flexibility and innovation in development, permitting mixtures of land use and mixtures of intensities of a land use which contribute to the quality of the community.
- Where conflicting land uses abut, the more intensive land use, or the site being developed, shall be subject to special site development standards designed to enhance the livability and reduce the negative impact on less intensive use.
- Maintenance and improvement of established residential areas will be promoted.
- Within the urban area, land use policies will attempt to provide a broad range of residential needs by mixing unit types and encouraging innovative development techniques.
- More intensive land uses proposed for established residential areas will be subject to special site development standards which minimize the negative impact on abutting properties.
- The location of commercial areas on the Comprehensive Plan land use map is intended to be general in nature, and specific designations for commercial areas will be determined by the Community Development ordinance.
- Commercial development in residential areas should serve the needs of the respective areas and shall meet special site development standards which minimize the negative impact on abutting properties.
- Lands designated for industrial use shall be preserved for that use and protected from incompatible uses.

## Land Use - Policies (3)

- The plans and actions related to land use by special districts, County, State, and Federal agencies should be consistent with the Comprehensive Plan of the City.
- The level of key facilities that can be provided should be considered as a factor in planning for various densities and types of land uses.

Land Use - Implementation Measures (1)

- Public education and involvement on the goals and guidelines of the Comprehensive Land Use Plan should be supported.
- The land use inventory should be continued and the needs of the area should be reviewed.
- Site/design review procedures should be provided within the Community Development ordinance.
- The use of newer, more cost- and energy-efficient building and site designs, such as common wall construction, cluster development, cooperative condominiums, mobile home parks, and planned unit developments, should be encouraged.
- The City should cooperate with the County and State to continue to review and update the Comprehensive Plan.



## DESCRIPTION OF LAND USE DESIGNATIONS

Low-density residential. Principally single-family dwellings occurring up to a maximum of 6 units per acre.

Medium-density residential. Combination of single-family dwellings and limited numbers of multi-family dwellings occurring up to a maximum of 12 units per acre.

High-density residential. Combination of dwelling types emphasizing multi-family dwellings occurring up to a maximum of 17 units per acre.

Neighborhood commercial. General commercial enterprises operating in a limited scale, compatible with surrounding neighborhood conditions, and intended to principally serve neighborhood residents.

General commercial. General commercial enterprises intended to serve residents throughout the community.

Light industrial. Light industrial enterprises, limited in scale, and conducted principally inside buildings.

Heavy industrial. Large industrial enterprises, unlimited in scale, and conducted both inside and outside buildings.

Public facility. Public or quasi-public facilities generally used by government, non-profit organizations, or large numbers of persons.

Sensitive development. Environmentally sensitive areas on which residential, commercial, or industrial activities may occur, but only in accordance with appropriate environmental protections.



## URBANIZATION SUB-ELEMENT

## Urbanization - History (1)

Klamath Falls spread in several directions over the years -- first upward along the shoreline where water transportation was available, since roads were nearly bottomless mud in winter and dust in the summer. Later, as technology improved the transportation systems -- automobiles appeared, roads were paved and the railroad entered the town -- the direction of growth changed and other districts came into being. The railroad, located in the southeastern portion of the town, became a center for industry; the eastern hills became the locale for residences, and Main Street linked the old with the new.

A rapidly expanding economy with the lumber and agriculture booms in the 1920's increased the population and the increase taxed City facilities to the limit. New wells had to be dug for water supplies, sewer service had to be improved, and fire and police services needed to be increased. There was little planning and as the city expanded, the new areas were a hodgepodge of residential, commercial, and industrial sections. Streets that were originally neighborhood avenues became major arteries carrying heavy traffic, much to the consternation of the remaining residents.

During the decade of the 1920's, the city's population tripled from 5,000 to over 16,000. Since that time it has remained relatively static, ranging between 15,000 and 19,000 within the City. The urban fringe around the City continued to expand; a prime example is the Altamont District. In 1940 it held 6,500 residents, while within the City limits were 16,500; in 1970, Altamont had grown in population to 15,750, while the City dropped by 700. A few other areas, such as West Klamath, reached a certain point in their growth and have remained static, retaining many of the characteristics of an earlier day.

Replatted subsection development, with little thought for unified services, linked together by haphazard byways, has created what today is best described as "urban sprawl". Klamath Falls, although not a large metropolis by any means, is a prime example of this fragmentation. It has become a city of contrasts: still a western farm town, yet the economic, industrial, and cultural hub of a many-thousand square mile area; a little city with big city problems.



### Urbanization - Current Conditions (1)

The City of Klamath Falls today has many problems as well as advantages which can be directly attributed to its past history of growth and development. The City consists of a spidery sprawl of land encompassing some 11.86 square miles and containing a population of 17,285, a population once again increasing after a decade of decrease. Within this area of City land are found such diverse areas of 1,600 acres of forest and 200 acres of agricultural land, and some 488 acres of recreational land. With this must also be considered the shoreline of Lake Ewauna and the southern part of Upper Klamath Lake, as well as the Link River and its canyon.

Klamath Falls is an urban center, serving as a major commercial hub for portions of southern Oregon and northern California, yet the City still retains much of its small town flavor with expanses of open space and agricultural lands within and around this urban center.

These two divergent aspects of the city have created many problems for both the urban citizen and the City government. Part of the problem occurs in the differential in land values found in the area. The assessed valuation of the entire county has shown a steady increase, with the 1977 assessed valuation of the city at 20 percent of the total for the county of \$186 million.

The current tax rate for the City of Klamath Falls is \$21.33 per \$1,000 of assessed valuation, down by several dollars from the 1973 figure of \$25.90 per \$1,000. The average tax rate outside the City but within the urban area is lower still, averaging about \$15.00 per \$1,000 assessed valuation. However contrary to this, bank data gives the average sale of residential property within the City limits as \$29,700 versus an average of \$32,800 for the suburban area, indicating that even though taxes are lower outside the City, property is higher.

Part of the costs affecting the higher tax rates within the City come from the higher costs of public service on a per capita basis. The public services are high because of the haphazard development and urban sprawl that characterized Klamath Falls prior to the current emphasis on land use planning and because some of the suburban areas use public services without being inside the City bounds and without contributing to their support.

## Urbanization - Current Conditions (2)

The lands available for urbanization are described in the Land Use Sub-Element. Overall, within the current City limits, only about 20 percent (1,736.4 acres) of the total land area remains available for residential, commercial, or industrial development. The Urban and Regional Planning Department, University of Oregon, reports that future market factors and the City growth policies will influence the utilization of this area. Probably not all of the available land will be developed, depending on community policies. Thus, of the land that is vacant, only 80 percent will be occupied; of all large parcels with structures on them, only 60 percent will be used; and of the land that has a development potential, only 35 percent will be redeveloped.

## Urbanization - Problems (1)

- Current farming and agricultural operations are extremely susceptible to development pressures for conversion to residential and other urban uses.
- Farming operations may be incompatible with residential or other urban uses (noise, odor, machinery, crop damage, trespass).
- Urban sprawl and leap-frogged development has created considerable conflict between rural and urban land uses and increased facility and service costs.
- Most citizens prefer a low-density, low-population growth pattern, but do not want the taxes necessary to support the services for this type of development.
- The supply of urbanizable land within the proposed planning area is limited. If future urbanization is not properly managed, a shortage of urbanizable land could occur.

### Urbanization - Future Alternatives (1)

- Less southern and eastern encroachment onto agricultural lands will occur.
- There is need to fill in vacant land areas within the Urban Growth Boundary.
- Restrictions on the use of agricultural lands for urbanization should be increased.
- Several "satellite" small towns may develop surrounding the larger urban area.

Urbanization - Goals (1)

- To provide an orderly, timely, and efficient transition from rural to urban land uses.

## Urbanization - Policies (1)

- In-filling of developable lands should be encouraged to minimize sprawl and take advantage of existing facilities and services.
- Conflicts between urban and rural uses should be minimized by proper land use planning and restrictions.
- Establishment of urbanization controls, such as the Urban Growth Boundary, will be based on: the carrying capacities of natural resources, projected population growth, economic expansion, location and capacities of public facilities and services, existing land use patterns, projected land use needs, and approximate social, economic, and energy factors.
- The existing imbalance of predominate southern and eastern urbanization, with its adverse effects on facilities and services, transportation, and energy consumption, should be corrected by promotion of urbanization to the north and west, thereby establishing geographically a "balanced" urban form.
- The expansion of public facilities and services will only occur within the Urban Growth Boundary and in accordance with the Comprehensive Plan.
- The City should coordinate land uses that lie along and outside the Urban Growth Boundary with the County.
- The lands designated as exclusive farm use within the Urban Growth Boundary which abut urban and urbanizable lands should not be subject to redesignation for urban purposes until a public need for urbanization has occurred sufficient to justify redesignation.
- Forest lands outside of the Urban Growth Boundary should be maintained in forest use.

## Urbanization - Policies (2)

- Conversion of urbanizable land to urban uses should be based on consideration of:
  - Orderly, economic provisions for public facilities and services;
  - Availability of sufficient land for the various uses to enhance choices in the market place;
  - Encouragement of development within urban areas before conversion of urbanizable areas.
- The value of agricultural and forest lands, as open space, will be a consideration in change of use of these lands.
- Future urban development should be contained within the geographical limits of the Urban Growth Boundary. Klamath County and Klamath Falls should jointly develop and adopt specific land use policies related to the urbanization of land within the urban area.

### Urbanization - Implementation Measures (1)

- Public education and involvement in the use and effect of the Urban Growth Boundary should be supported.
- Coordination of comprehensive planning with State and County officials should be promoted.
- The use of innovative methods of multiple use developments which allow a higher density population around core commercial and service areas should be encouraged.



M A P N O T E

SUB-ELEMENT: URBANIZATION

THIS SUB-ELEMENT WILL APPEAR IN FINAL FORM WITH A MAP DEPICTING THE FOLLOWING ITEMS:

INTERIM URBAN STUDY BOUNDARY

THIS MAP CURRENTLY EXISTS IN ROUGH DRAFT ONLY, AND IS NOT AVAILABLE FOR REPRODUCTION. HOWEVER, DRAFT COPIES ARE AVAILABLE FOR INSPECTION AT THE CITY PLANNING DEPARTMENT OFFICE.





## L I V A B I L I T Y   S U B - E L E M E N T

## Livability - History (1)

From the approximately 285 people here in 1883, the population of the urban area has grown to over 35,000, making Klamath Falls the fifth largest urban area in the state; yet the city retains its small town flavor. Where else do city gardens suffer from the eating habits of such wildlife as quail and deer. How many other major urban areas find it necessary to prohibit horses on sidewalks or to corral cattle on Main Street.

Klamath Falls is growing far more rapidly than population projections have estimated. In 1975, City population was projected at 16,500, and in actuality was determined to be 16,200. The projection for 1980 is a City population of 17,000; however, the July 1, 1977, Bureau of Census data show a City population already exceeding the 1980 projection by 285 people (17,285 population). If this growth rate is sustained, the City will reach 19,000 by 1980. Klamath is not unique in the growth; since 1970, the rate of population increase in the entire state has been twice as great as the national average. Two thirds of this growth is the result of in-migration.

Population trends from 1900 to 1970 were from rural to urban; people left the farm to enjoy the greater employment opportunities, higher wages, and cultural advantages of city life. Since 1970 non-metropolitan counties have been growing at a faster rate than metropolitan counties, indicating a reversal of the trend toward urbanization. This is not just a growth of suburban "bedroom" counties adjacent to the cities; counties with virtually no commuting ties to metropolitan areas have experienced a greater growth rate of population and in-migration than metropolitan areas. Slightly over 40 percent of the growth in Oregon's incorporated areas during the eight-year span 1970-77 was in cities with populations between 5,000 and 25,000.

Many factors are influencing this turnaround in the direction of migration patterns. Sociological trends, economic changes (less gap between family incomes in urban versus rural areas), improved transportation, increased industry and manufacturing in rural areas and retirement to non-populated areas all contribute. One survey (DeJong and Sell, cited by the Bureau of Governmental Research and Service, University of Oregon) showed, "... persons moving to non-metropolitan areas cited quality of schools, cost of housing, safeness of streets, large lots, and availability of parks as the

## Livability - History (2)

most important factors to find in a new residential location. ... these desires probably could be satisfied more readily in a non-metropolitan than in a metropolitan setting."

## Livability - Current Conditions (1)

Klamath Falls is a prime example of this quality of livability that people are seeking. The area offers education from nursery school to a four-year college, recreation ranging from skiing and winter sports to fishing, hunting, hiking, and extensive water-related activities. Culturally there are local symphonies and theater groups; larger groups tour through the area, and the Shakespearean Festival and the Britt Music Festival are only a two-hour drive away. Also, within short distances are such scenic splendors as Crater Lake and the Lava Beds National Monument as well as the High Cascades to the west and the desert to the east.

Services are generally most adequate to support the area. Water is plentiful and potable without extensive treatment; collection services for sewer and solid waste can serve an expanding population. Retail trade is expanding to keep pace with the area's growth.

The energy potential for the Basin is great. Solar energy is waiting to be used and the geothermal possibilities are just beginning to be developed. Although Klamath Falls is geographically isolated, its electronic media keep citizens informed of the rest of the world, and the airlines, railroads, and highways provide easy access out of the Basin. The health and safety of the populace is most adequately served by the various organizations and institutions situated here.

Housing and transportation are two areas that do have problems; low-income housing is scarce and local mass transportation is nonexistent. The economy at present has a limited diversity, but that is changing as industries other than wood products are locating in the area. However, many of the people in-migrating to the Klamath Basin are doing so because of the clean air, adequate sunshine (265 days per year), open spaces, and excellent facilities and services rather than any specific job opportunities. Primarily they come for a better place to live; employment takes second place.

How many people can Klamath County or the Klamath Basin hold? Considering technological advances and improvements in farming, transportation, and a world situation affecting imports into the area that is an impossible question to answer. However, going back to the bare necessities of existence -- water, food, and living space, an extensive study has been done on the carrying capacity of the state of Oregon and each county and drainage

## Livability - Current Conditions (2)

basin in the state; this includes both Klamath County and the Klamath Basin. (See Don John Karr, *A Quantitative Method for Using an Inventory of the Soil and Water Resources of the State of Oregon to Determine Human Population Carrying Capacities for Two Acceptable Qualities of Life*, a Doctoral Dissertation, Oregon State University, Corvallis, July 1975.)

A method was devised to convert the food producing capacities of the soils to numerical data. Another method was developed for converting housing and space needs to numerical data. Streamflow data was included and a total of seven major characteristics were determined and put through a computer program. The carrying capacity for human needs for housing and associated construction, dietary carbohydrates and proteins, and water were determined for two different qualities of life. The final results showed Oregon's carrying capacity to be about 4.0 million people at a high standard of living and about 4.8 million people at an adequate standard of living.

The high standard or present quality of life requires 250 gallons of water per individual per day. Land requirements for this level include .602 acres of cultivated soils annually to satisfy the carbohydrate requirements, including the amount necessary to "feed out" beef for animal protein requirements, and .298 acres of cultivated soils to satisfy individual construction requirements. The adequate or standard quality of life requires 150 gallons of water per day per individual, .517 acres of cultivated soils for carbohydrates and protein requirements, and .225 acres for construction.

Klamath County lies primarily in the Klamath Drainage Basin (81.4 percent). Seventy-six different soils series and sub-series were inventoried in the County. The Klamath Drainage Basin primarily coincides with County boundaries with 86.2 percent of the drainage basin lying in Klamath County. For the Basin 68 different soils series and sub-series were inventoried. The following chart shows the carrying capacities for these two political and geographical entities in terms of the number of people for which construction lands, carbohydrate production and protein production can be met.

### Livability - Policies (1)

- Allow growth to occur as naturally as possible without undue restrictions, or conversely, aggressive promotion.
- Support outlying satellite communities (Midland, Keno, Merrill) in their efforts to retain identity and autonomy.
- Facilities and services should adequately serve existing residents and businesses, and not be overburdened by new public or private development.
- To establish a development process which evaluates and locates development projects in terms of their scale and related community impacts and weighs the costs of development versus returns in livability.
- Various criteria should be used to evaluate livability including: privacy, attractiveness, aesthetic contribution, and neighborhood character.
- Public and private actions should result in a net benefit for existing City residents and should contribute to the improvement of the local economy.



#### Livability - Implementation Measures (1)

- Public education and involvement in identifying and protecting the area's livability should be supported.
- New alternatives for the urban area which will balance costs, economic gains, private needs against citizens' livability should be reviewed and developed.

BIBLIOGRAPHY NOTE

A DETAILED BIBLIOGRAPHY IS AVAILABLE FOR INSPECTION  
IN THE CITY PLANNING DEPARTMENT OFFICES.