Willamette Falls Locks Economic Impact Analysis

FINAL REPORT

Prepared for

Clackamas County Tourism Development Council and Oregon Tourism Commission

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Background

The Willamette Locks are located on the Willamette River in West Linn, directly across the river from Oregon City and approximately 20 miles upstream of Portland, Oregon. This area played a key role in the development of the western U.S. In 1840, Robert Moore came to Oregon from Illinois and purchased 1,000 acres lying along the west bank of the Willamette River at the Falls. The community developed by Moore was incorporated as the City of West Linn on August 15, 1913[1]. Oregon City was the first permanent Euro-American settlement in the Willamette Valley and the first incorporated city west of the Rocky Mountains. Founded in 1829 and incorporated in 1844, it first became the home to fur traders and missionaries. As "the end of the Oregon Trail," it soon became the final destination for many early immigrants[2].

The growth that occurred in the west from 1874 until the early 1900s greatly increased the need for efficient movement of freight. Prior to construction of the Locks in 1874, goods bound for locations south along the Willamette River were portaged at great expense and risk around the Falls. Local entrepreneurs constructed the locks to circumvent the Willamette River's 40-foot, horseshoe-shaped falls and facilitate the flow of goods.

The Locks also formed the core of an industrial area that sprang up around them, including a paper mill, which has been in continuous operation for more than a century, and a hydroelectric plant where the first overland transmission of electricity in America occurred. The U.S. Army Corps of Engineers purchased the Locks in 1915[3]. The hydroelectric plant, still operating, is owned by Portland General Electric (PGE).

The Locks are unique since they were the first, and are possibly the only major remaining, multi-lift navigation locks built in the United States. The Locks include four lock chambers, a canal basin, and a guard lock. Each lock is 40 feet wide and 210 feet long. The average passage time through the locks is about 45 minutes going upstream and 30 minutes downstream. As a result of their uniqueness and key role in Oregon history, they were placed on the National Historic Register in 1974.

Throughout the recent past, the communities along the Willamette River have begun to build parks, improve public access (trails and boat access) and undertake economic development projects. As a result of these efforts, the Locks have significant value for recreational users and tourists and provide a vital link of connectivity between upriver and downriver communities.

Study Purpose

The costs to operate and maintain the Locks have been the responsibility of the U.S. Army Corps of Engineers since 1915. The Corps currently funds navigation projects if they meet minimum threshold volumes based upon the number of tons that are shipped or received. The paper mill in

[1] Source: City of West Linn, Historic Preservation.

[2] Source: City of Oregon City, Historic Context Statement, 2000. See Appendix for the full statement.

[3] Since the purchase of the locks, transit has been free to all vessels.

West Linn used the Locks continuously to receive mill inputs (wood chips and pulp) and ship finished paper products until 1997, when the West Linn Paper Company changed its logistics procedures and shifted from barge to truck transportation. As a result, the Locks no longer meet the threshold requirements for funding by the Corps. The Corps has announced that it plans to eliminate the Willamette Locks from its operating budget, and transition the complex to "caretaker status," effective October 1, 2004.

Several stakeholders are engaged in finding ways to keep the Locks funded. Funding for 2005 has been secured ($72,000 is in the U.S. Army Corps of Engineers budget for 2005). The goal is to find gap funding to operate the Willamette Locks in 2006 and to develop sustainable long-term solutions for keeping them in operation and open to the public.

One part of this strategy consists of determining the economic impact of the Locks. The Oregon Tourism Commission and the Clackamas County Tourism Development Council retained BST Associates to assess the impact of a permanent closure of the locks, as well as to evaluate potential untapped markets for the Locks.

Findings

The Willamette River was once the major route for transporting goods up and down the Willamette Valley, and towns tended to grow around river landings. As commonly happened throughout the country, as the railroads and then highways developed, the river towns slowly "turned their backs" on the river. The river slowly fell out of the public perception, and when it was thought of at all it tended to be as a source of water for irrigation or for industrial processing. However, communities along the River are once again turning their focus on the River. Connectivity between upriver and downriver locations is a key goal of these communities.

Re-opening the Willamette Falls Locks will assist in these efforts. The projected use of the Locks includes recreational vessels such as kayaks, canoes, and power boats; passenger boats that operate from bases in Portland and Oregon City (jet boats, stern wheelers and potentially canal boats); construction vessels based in Oregon City; and commercial vessels based above the Locks that have occasional need to transit to Portland for maintenance and repairs.

The estimated cost of operating the Willamette Falls Lock is estimated at approximately $424,000[4] per year (in 2004 dollars) compared with an annual benefit to the State of between $1.5 million (low) to $2.9 million (high)[5]. This implies a benefit/cost ratio of 3.7 (low) and 6.9 (high). There are no known environmental concerns (impacts to anadromous fish, water quality or other issues) related to keeping the Locks in operation.

[4] The cost of operations and maintenance is estimated to be $430,000 in 2006.

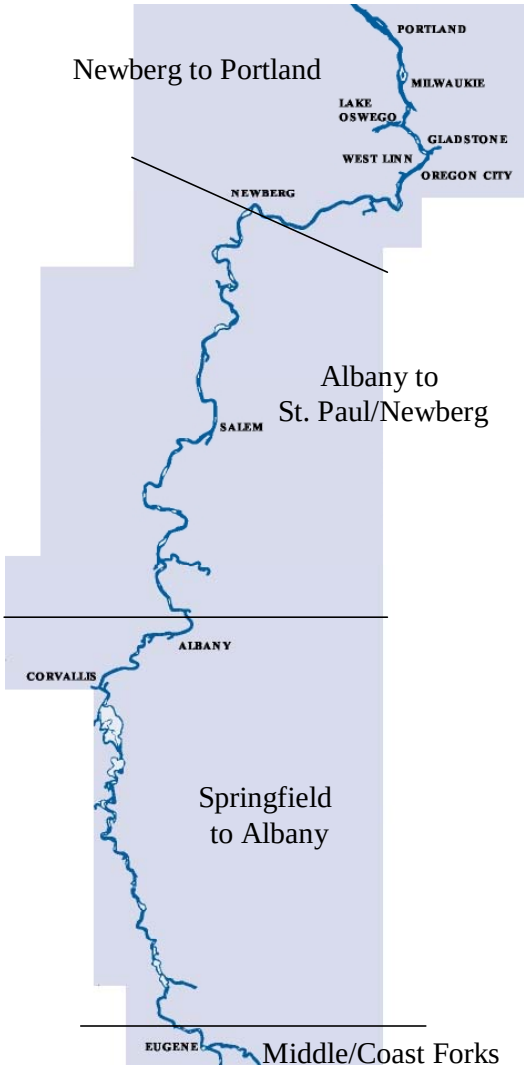
[5] The estimate of benefits only includes existing uses. If potential future uses are included, the benefit/cost ratios increase to between 5.7 (low) and 11.0 (high).

Existing Uses & Potential Market Opportunities

This section reviews existing and potential future uses of the locks.

Description of Project Area

The project area that is impacted by Lock closure includes the entire Willamette River Basin from below Eugene to Portland. The geologic and cultural landscape varies widely over the four stretches of the River (Middle & Coast Forks, Springfield to Albany, Albany to St. Paul/Newberg and Newberg to Portland).



From the densely urban, industrial waterfront and deep-draft harbor of Portland the scene slowly changes to one of suburban residential waterfront with shallow channels downstream of the locks. At Willamette Falls the shoreline is once again industrial, with paper mills on either side of the river as well as a hydroelectric generating station. Upstream of the locks the scene once again becomes residential, before the housing developments eventually give way to agriculture. From Newberg to Eugene the river flows mainly through farm country, towns and cities.

The existing Corps of Engineers navigation project provides for improvement of the Willamette River between Portland (Mile 14) and Oregon City (Mile 26) by a channel 8 feet deep at low water, 200 feet wide below Cedar Island and 150 feet wide to Oregon City. Above Oregon City the authorized channel is 6 feet deep with a varying width to the mouth of the Santiam River at Mile 108.5. Authorized channel depths are 5 feet from the Santiam River to Albany (Mile 120), and 2.5 to 3.5 feet deep from Albany to Corvallis (Mile 132). The Corps project also provides for a channel in the Yamhill River 4 feet deep at low water and 60 feet wide from its mouth to McMinnville (18 miles) secured by means of a lock-and-dam near Lafayette and by removal of obstructions.

The authorized project is only 18 percent complete, with the 8-foot channel between Portland and Oregon City (Mile 26) and the 2.5- to 3.5-foot channel between Oregon City and Albany (Mile 120) completed in 1939, and the 2.5- to 3.5-foot channel between Albany and Corvallis (Mile 132) completed in 1945. The remaining work required to secure channel depths of 6 feet from Oregon City to the mouth of Santiam River, and 5 feet from that point to Albany has never been completed. Due to lack of use by commercial traffic for which facilities were provided, operation of Yamhill Lock was discontinued in 1954, and the lock and adjacent property were turned over to Yamhill County in 1959. There is also no maintenance of the Willamette River channel above Newberg (Mile 50), so it is only usable during higher river stages.

According to NOAA, "navigation of Willamette River above Portland is hazardous due to the rocks, shoaling bars, and strong currents. Local knowledge and midchannel courses are recommended. Present chart coverage extends only to Newberg, 50 miles above the mouth." In addition, the NOAA data describes a four-mile stretch of the river above the locks, in the vicinity of the entrance to Tualatin River, 28.5 miles above the mouth, as shallow and winding. According to the *Willamette River Guide*, between Newberg (Mile 50) and Albany (Mile 122) the river channel averages 12 to 15 feet deep, but has occasional shallows that present challenges to motorized vessels. This stretch of river has a number of boat ramps and transient docks, such as the new dock in downtown Salem (Mile 84). There are also boat-accessible camping areas, such as Wells Island Park (Mile 106).

From Albany to Corvallis (Mile 132) the Willamette River is good for paddling canoes and kayaks, but is relatively shallow for powerboats. Upstream of Corvallis the Willamette River is faster and littered with snags, and between Harrisburg (Mile 160) and Eugene (Mile 185) the river is also marked by shallow water and shifting channels. The condition of the river channel above Newberg may present a challenge to expanding economic use of the Willamette Locks for recreational boating and tourism. For paddle craft such as canoes and kayaks this stretch of river is not difficult to navigate, but for larger vessels more caution will be needed, and successful passage may depend on water conditions.

Figure 1: Entrance to Willamette Locks

Source: BST Associates

The Willamette Locks are located on the west bank of the river at 26.2 miles above the mouth. These locks are relatively small, with usable length of 175 feet and usable width of 37 feet. There are a total of four lock chambers with a total lift of 50 feet, and the water depth is five feet over the miter sills at low water.

A number of boat ramps and docks that are open to public use are located above and below the Willamette Locks. Below the locks these facilities include:

Table 1: Recreational Boating Facilities on the Willamette River Below Willamette Falls & Locks

Name	County	Ramp	Dock
Cathedral Park	Multnomah	Yes	No
Eastbank Transient Tie-Up	Multnomah	No	Yes
Riverplace Marina	Multnomah	No	Yes
Riverplace Public Dock	Multnomah	No	Yes
Sellwood Riverfront Park	Multnomah	No	Yes
Staff Jennings Boating Centers	Multnomah	No	Yes
Swan Island Ramp	Multnomah	Yes	No
Willamette Park Dock	Multnomah	Yes	Yes
Cedar Oak	Clackamas	Yes	No
Clackamette Park	Clackamas	Yes	Yes
Jefferson Street	Clackamas	Yes	No
Meldrum Bar Park	Clackamas	Yes	No
Oak Grove Boat Ramp	Clackamas	Yes	No
Sportcraft Landing	Clackamas	Yes	Yes
Sportcraft Marina	Clackamas	No	Yes

Source: Oregon State Marine Board

Boating facilities above the locks include:

Table 2: Recreational Boating Facilities on the Willamette River Above Willamette Falls & Locks

Name	County	Ramp	Dock
Bernert Landing	Clackamas	Yes	Yes
Boones Ferry Landing	Clackamas	Yes	Yes
Hebb Park	Clackamas	Yes	Yes
Molalla River State Park	Clackamas	Yes	No
Wilsonville Memorial Park	Clackamas	No	Yes
Rogers Landing	Yamhill	Yes	No
Wheatland Ferry	Yamhill	Yes	No
River Front Park	Marion & Polk	No	Yes
Champoeg State Park	Marion & Yamhill	No	Yes
San Salvador	Marion & Yamhill	Yes	No
Willamette Mission State Park	Marion & Yamhill	Yes	No

Source: Oregon State Marine Board

Above Newberg the channel is difficult to navigate due to shifting shoals and a winding channel. However, in the vicinity of Salem, 85.6 miles above the mouth, there is sufficient water depth for the operation of the vessel excursions (described later in this document). There are also a number of marinas and boat launches at Salem.

Vehicle ferries cross the Willamette River at three locations above the Willamette Falls:

- The Canby ferry crosses the river about 1.3 miles above Walnut Eddy.
- The Wheatland ferry crosses Willamette River about 72.5 miles above the mouth.
- The Buena Vista ferry crosses the river near Buena Vista, 106 miles above the mouth of the river.

Community Plans

The Willamette River was once the major route for transporting goods up and down the Willamette Valley, and towns tended to grow around river landings. However, as commonly happened throughout the country, as the railroads and then highways were developed, the river towns slowly "turned their backs" on the river. The river slowly fell out of the public perception, and when it was thought of at all it tended to be as a source of water for irrigation or for industrial processing.

However, agencies (cities, counties, state and federal governmental agencies and private sector interests) have begun to recognize the economic development potential of historic river districts, and efforts are underway in a number of places to reconnect cities with their waterfronts. At the River Cities 2002 conference, representatives from Willamette Basin shared their visions for reconnecting with the river, and described projects that they were undertaking to achieve those visions. The following section describes some of these plans, and is taken largely from the proceedings of that conference.

In addition to the plans of the individual cities, the Mid-Willamette River Connections (MWRC) group was formed in 2001 to work closely with local communities and the public to identify ways to reconnect with the Willamette River. In late 2002, the group held multiple open houses to get the public's ideas, and one of the most popular was establishing a water trail. The first step in this is the creation of a 34-mile leg of the trail from the Buena Vista ferry, near Independence, to the Wheatland ferry, north of Keizer. The plans by communities along the Willamette River are briefly discussed in the following sections. This review is not intended to be a complete assessment of all planning and development efforts, but rather to illustrate the strong interest in the Willamette River throughout the Basin.

Eugene

The City of Eugene, Oregon's second largest City, lies at the south end of the Willamette Valley. The Willamette River cuts through the city, with approximately 13 miles of riverfront within the city limits. Currently, land uses along the riverbanks are mixed, as are the setbacks and environmental protections. Two large areas closest to downtown on either side of the river are preserved as public parks.

For the citizens of Eugene, a waterfront plan to guide future uses and to enhance and restore the Willamette is of paramount importance. There have been significant physical changes to Eugene's downtown waterfront, including development of a major public plaza and connections

to an extensive system of bicycle and pedestrian paths along the river. There is a strong desire for a well-designed waterfront and a better connection between downtown and the river.

Development along the riverfront has begun. The Eugene Water and Electric Board, located on waterfront property closest to downtown, has begun to consider moving in whole or in part from their prime river location. In addition, new hotels have been constructed near the waterfront, north of downtown. The University of Oregon is engaged in a phased build-out of approximately one million square feet on the Riverfront Research Park, designed to attract high-tech and related firms in collaboration with University researchers. The Research Park has been designed to enhance views of the Willamette River and other natural viewpoints. About half of the site will be maintained and/or enhanced as open space areas and the riparian strip along the riverbank will be preserved. The development also calls for improved pedestrian, bicycle and vehicular connections, thereby increasing public access to the Willamette River and Millrace.

The new $70 million federal courthouse that recently broke ground in Eugene will introduce an award-winning architectural structure into the city and also serve to enliven the riverfront. The new structure is being built on the eight-acre Agripac cannery site - once the location of a thriving vegetable canning operation but more recently a deteriorating eyesore since the cannery closed in 2001. The new courthouse will front the shore of the Willamette River and will be one of the first things people crossing the Ferry Street Bridge will see as they enter Eugene.

Planning at the Courthouse has been guided by four goals:

- Connect downtown to the river in a memorable, inviting, and environmentally sensitive way;
- Create the courthouse area as a special place;
- Connect this area back to the core of downtown; and,
- Allow the development in this area to contribute to the vitality of the City’s core.

Springfield

The City of Springfield is nestled between the Willamette and the McKenzie Rivers. Since the City of Springfield assumed jurisdiction for Glenwood in 1999, the Willamette River flows through the downtown core, creating the opportunity for the community to embrace the river on both the west and east banks.

Island Park, Willamalane Park and Recreation District's regional park, border the river. To the west there is a greenway along the riverfront and low-density residential development immediately in back of the greenway. East Alton Baker Park, another regional park facility, bookends the river's edge with Eugene. In April 2001, the City of Springfield, in collaboration with the Springfield Renaissance Development Corporation, sponsored a public "planning charette." The goal was to involve the local community in a hands-on planning workshop to create a blueprint for future development in the downtown area.

Both the Willamette River and the Mill Race emerged as focal points for recreating a vibrant downtown for Springfield. A key component is to rehabilitate the Springfield Mill Race -- a partially natural, partially hand-dug channel that flows from the Middle Fork of the Willamette through Springfield to the downtown area, where it rejoins the Willamette just downstream of the confluence between the Coast and the Middle forks.

Harrisburg

The City of Harrisburg exists because of the Willamette River. Over the years, the river has directly and indirectly been a significant factor in the commercial, industrial, residential, and cultural development of Harrisburg. Settlers in the mid-1850's were attracted by the combination of good farmland and the availability of the river as a means to transport goods up and down the Willamette Valley. From the time of the shallow-drafted paddle wheel boats that plied the river in the late 1800's, to the present where 12,000 vehicles a day cross the Willamette River at the only bridge between Eugene and Corvallis, the river has encouraged entrepreneurs and recreational enthusiasts.

The ferryman gave way to the bridge in 1926, resulting in the construction of an important state highway, Highway 99E, which is the main street through town. Perhaps the single largest local business that was spawned by the river is Morse Brothers. The company began in Harrisburg as a small dredging operation, extracting gravel from the riverbed. Today, it is a large statewide operation dealing with gravel, concrete, prestress concrete structures, and other industrial operations.

Riverfront Park extends for 10 blocks along the river. In 1994, plans were initiated to make needed improvements to the park. These plans became a reality in 1995-96, through the combined efforts of the City of Harrisburg, its citizens, the State of Oregon, and the federal government. The showpiece for the improvements though, was the construction of a gazebo and the installation of old-fashioned light poles throughout the park.

Corvallis

The Willamette River forms the eastern border of Corvallis' downtown area. First Street runs parallel to the riverfront, and historically has served as a warehouse and industrial area. Over time, the warehouses and industry have shifted to a developing retail area. The land east of First Street, including the riverbank, was purchased in the 1950s to serve as the location for a by-pass around downtown. Community outcry led to a change in location for the by-pass, and the downtown riverfront came into public use. A multi-modal path was constructed, and volunteers planted trees and other vegetation. The community developed a vision for the riverfront as a community center, combining commercial business, park use, and a celebration of the river's natural features. After years of planning, that vision is being realized through the Corvallis Riverfront Commemorative Park Project, now under construction.

The Riverfront Commemorative Park Project consists of three main elements:

- Bank Stabilization and Restoration,
- Construction of Riverfront Commemorative Park, and,
- First Street and Sidewalk Improvements.

The park design includes many features to attract a variety of non-vehicular uses, including plazas, overlook areas, park furnishings and amenities, seating areas and lawn areas, extensive landscaping, a multi-modal path, interpretive fountain portraying the historic Willamette River channel and interpretive signs and artwork.

The redevelopment of the riverfront also assists in economic revitalization for Corvallis. In addition to creating an attractive park that will draw tourists and events to the riverfront area,

special zoning requirements have been developed for the riverfront area that allow for development by commercial uses.

Albany[6]

In the 1800's, Albany was a major steamboat landing on the Willamette River. The river was a vital link to the rest of Oregon and the world. Through Albany, the region marketed its products. It was access to the river which first made Albany a successful regional trade center. Many of Albany's early homes and downtown commercial buildings are elegant reminders of the city's prosperous river trade era. With the coming of the railroads, development of the automobile, and an extensive system of roads, the commercial importance of the river declined. This decline also resulted in the city's attention turning away from the river. For many years Albany's riverfront was neglected. Fires and neglect destroyed the abandoned warehousing and commercial buildings along the river. The riverfront became an unattractive and inhospitable place.

Today, Albany has focused once again on the Willamette River as a significant community asset. Recent park development, land acquisition, and downtown planning and development utilize the Willamette River and the Greenway as primary design and aesthetic elements. The City is the largest landowner within Albany's Greenway Boundary.

The City of Albany acquired approximately 70 acres of land bordering the Willamette River from the Oregon State Highway Division in 1983. Adjacent to this property, the City also has a lease agreement with the Oregon Department of Transportation for use of an additional 30 acres. The Takeena Landing property runs for approximately one and one-half miles along the river directly across from downtown Albany. The property was developed in 1988. An access road, parking lot, boat ramp, and day use areas were constructed. Also, a hiking/nature trail was developed along the length of the property

The goals of the City of Albany include developing Albany's Willamette River parklands and encourage development of those parklands within proximity to the Albany area as a major recreational focus, promoting:

- Continued use of Monteith Riverpark for a variety of cultural and social events.
- The development of Takena Landing Park as a resource by developing boat launching, nature trails, and camping opportunities.
- The development of pedestrian and bicycle paths along the Willamette River linking major recreation facilities and nearby communities.

Independence

Independence is a small city on the banks of the Willamette River with a population of less than 6,200. The city lies between two National Wildlife Refuges -- Ankeny and Baskett Slough.

In 1997, the city completed a Downtown Development Plan. A major part of the Downtown Development Plan is focused on Riverview Park, which lies between the Willamette River and Historic Downtown Independence. A new park restroom was completed in early 2001. The Plan also called for the development of an amphitheater in Riverview Park.

[6] Source: City of Albany Comprehensive Plan

Salem

The City of Salem, which is the State Capital and is also steeped in history, has four parks on the Willamette River. Mintow Brown is the largest of these, comprising a total of 900 acres, 300 of which are leased for farming. The city has developed a layout for this property that includes a dog park, wildlife refuge, series of trails, and pathway along the river.

Riverfront Park is the "Front Yard" of the city, and is the site of numerous improvements now in progress. It features an outdoor amphitheater, interactive fountain, large festival lawn sites, a path system that circles the park, and picnic and park bench sites along the many overlooks. The north end of the park incorporates the A.C. Gilbert's Discovery Village, including a children's science museum, science discovery playground, and carousel. In addition, a new dock will be used by the tour boat "Willamette Queen" and the Salem Fire and Rescue and by the Coast Guard Auxiliary. It is also available for public use.

A new conference center nearing completion across the street from Riverfront Park is likely to draw large numbers of people to the park, and may increase the demand for boat-related tourism. The City of Salem is also participating in the planning and implementation of the Willamette River Water Trail.

Keizer

Keizer is a growing community with a population of 32,950, located approximately 35 miles south of Portland on Interstate 5, bordering Salem on the south and the Willamette River on the west. Most of the development along the river in Keizer has been residential. The city of Keizer owns three small parks in various stages of development that allow public access to the banks of the Willamette.

In 2000, the City Council created a long-range goal to explore opportunities for developing greater access to and connections with the Willamette River within Keizer by public, public/private, or public/public partnership efforts. This goal, titled Regional Intergovernmental Visions Enhancing River Resources (RIVERR) is as follows: "Explore intergovernmental cooperation for the development of a greenway from Salem to Willamette Mission Park through Keizer. This task force will investigate the potential opportunities for the residents of this region as they relate to the river and work toward furthering Governor Tom McCall's vision for greenway enhancements.

Though the City of Keizer does not currently have a significant presence along the banks of the Willamette River or a River Area Masterplan addressing future projects, as opportunities present themselves to develop better connections to the river, the city will eagerly explore them. One such current opportunity is the possibility of developing a partnership with Oregon Parks & Recreation Department (OPRD) to create a natural park just west of the Keizer City limits.

The City Council has determined that public access to the river is important for the betterment of the community and will actively pursue opportunities that present themselves in the future to accomplish that goal. The City is working with Marion County and OPRD to establish a 119-acre park on the Willamette River, known as Keizer Rapids Community Park. This project will improve connectivity, meet regional needs for Willamette River access and enhances the corridor's potential for recreation, alternative transportation, green space, history, education health and fitness, aesthetic qualities, habitat and water quality.

Newberg

Like many American cities, Newberg's waterfront has developed primarily to accommodate industrial uses, but also includes rural residential, agricultural, and recreational uses. Most of the land area along the riverfront is currently designated for industrial development. Only a few streets provide access to the riverfront, and none provides a strong connection between the river and downtown.

Opportunities exist to connect many of the parks together with trails. Rogers Landing is the only piece of property in the project area that is currently being used as a park. The site of the former Newberg Landfill is the largest piece of contiguously owned public property within the project area, and provides the best opportunity for the creation of a new park. The city hopes eventually to connect to a Willamette Greenway and/or other regional trail systems.

The Newberg Riverfront Master Plan (June 2001) puts a new focus on Newberg's riverfront and sets the stage for developing a vibrant neighborhood, combining small-scale commercial uses, housing of various types, and open space. The proposed plan focuses development in upland areas and keeps floodplain and riparian areas in open space and park uses. It includes a new Riverfront Commercial District that provides for pedestrian-friendly, river-oriented commercial development. The former landfill site and the rest of the Willamette floodplain are designated for open space. A regional trail connects Newberg to Dundee to the west and to Champoeg State Park to the east. Within the project area, a pedestrian esplanade runs through the riverfront commercial area overlooking the river. A park or open space is planned for the riverfront commercial area to take advantage of an existing oak grove and to provide public open space in the central portion of the riverfront commercial zone.

Wilsonville

The City of Wilsonville is located along the I-5 Corridor approximately 15 miles south of Portland, Oregon. Incorporated in 1969, Wilsonville is the southern gateway to the Portland metropolitan area and is one of the fastest growing areas in the State.

The Willamette River divides the city into areas north and south of the river. Historically, the Willamette River played a significant role in the growth of the City. Settlers to the area established a ferry boat (Boones Ferry) on the Willamette River more than 100 years ago. After the development of the I-5 freeway to the east of the Boones Ferry District in the 1950s, the community changed its focus to this new artery for moving goods and people.

Situated along the Willamette River are the City's Memorial Park, and Boones Ferry Park. The Willamette River Greenway, both in the city and outside, is protected by local ordinances and state law which require that part of the adjacent properties and their associated riparian areas be designated as a "Greenway". Development within the Willamette River Greenway is reviewed by the Oregon Parks and Recreation Department and the City to ensure that the Willamette River and its vegetated banks are impacted to the least extent possible and that uses on the river are regulated.

The City has studied a proposed trail system that could reestablish the historic link the early settlers had to the Willamette River. The Tonquin Trail or Greenway, as proposed by the Metropolitan Service District (Metro), would not only connect the City of Wilsonville to the Willamette River, but would also provide a connection to the communities of Tualatin and Sherwood, and the Tualatin River National Wildlife Refuge. Reestablishing a link to the

Willamette River will be a significant accomplishment of the proposed Tonquin Trail. If completed, the trail will ensure the protection of land for open space and natural areas, and provide a unique opportunity for the citizens of the region to explore the abundant natural landscapes within the City and surrounding areas.

Canby

Canby is a rapidly growing community located just 17 miles south of Portland. Canby's past and present are intertwined with the two rivers that embrace it to the north and west. The Willamette River on the north and the Molalla River on the west define the city's urban growth boundary. The Molalla flows into the Willamette less than two miles northwest of Canby.

Canby has recently completed a master plan for revitalizing the downtown core, and has created a Parks Acquisition Plan to implement the city's Parks and Recreation Master Plan. Throughout the public processes for developing both the above plans, participants expressed a desire to create an interconnected system of parks and trails, linking existing parks and trails to a perimeter trail system roughly paralleling the urban growth boundary. For example, a person could stop and participate in an event at Wait Park located in the heart of downtown Canby, and continue on to the Willamette River via the interconnected trail system. Key to the creation of the "Emerald Necklace" concept is identifying the critical connections that would provide public access to the Willamette and Molalla rivers.

West Linn

The Willamette River borders West Linn on the southeast and northeast for a lineal distance of approximately 6.4 miles. This area provides many of West Linn's scenic views, and the river itself is used extensively for recreation and commerce. During peak usage, the river is heavily used for swimming, boating, water-skiing, and fishing.

All lands within West Linn's Willamette River Greenway are either developed or committed to urban uses. Of the 6.4 miles of shoreline along the Willamette within West Linn, about two miles are currently zoned for industrial use. Seven West Linn park sites have frontage on the Willamette River, making approximately 2.1 miles of shoreline directly accessible to the public.

- The combined Willamette Park and Bernert Landing Boat Ramp measure 22.5 acres, and include a boat ramp and dock.
- The Cedaroak Boat Ramp is located in a 16.5-acre park below the Locks that includes a boat ramp, river access, and hiking trails.
- Mary S. Young Park is a large forest park located just upstream of the Cedaroak Boat Ramp. This park does not have a boat ramp, but does offer Willamette River shoreline that is accessible by foot.
- Cedar Island Park is a 14-acre island in the Willamette River that is accessed via a bridge from Mary S. Young Park or by boat from the river.
- Burnside Park is a 10-acre wilderness park located midway between the Locks and Mary S. Young Park that provides hiking trails, river access, but no boating facilities.

The primary community visions for the Willamette River are to provide riverfront accessibility coupled with preservation by: the creation of a Willamette River Greenway trail paralleling the river, including numerous vistas and access points; and coordination with the U.S. Army Corps of Engineers, West Linn Paper Company, PGE's T.W. Sullivan Hydroelectric Power Plant, and

other industrial properties to ensure future use and development of such properties, while encouraging and assisting in the preservation of permanent natural areas for fish and wildlife habitat and scientific/ecological areas.

A separate focus is that of economic and tourism development around Willamette Falls. The City adopted the West Linn Parks, Recreation, and Open Space Master Plan in 1998 that lays the groundwork for property acquisitions and a riverfront trail through the industrial property above Willamette Falls. A subsequent bond measure was passed later that year, which provides funding for this trail. The City was bequeathed seven acres of riverfront property that is currently in a public planning process for the design and development of trails, access, and interpretation. Also, a community group has created the Willamette Falls Cultural Heritage Committee for the purpose of establishing a riverfront museum and other interpretive opportunities near the falls.

Oregon City

Located adjacent to the confluence of the Willamette and Clackamas rivers and the Willamette Falls, Oregon City's waterfront area includes some of the region's most spectacular natural settings. In addition, a man-made feature - Clackamette Cove - which was a former gravel mining and concrete production site located on the Clackamas River, offers tremendous potential to become a valuable environmental and recreational asset for the area.

Frustrated by the lack of timely redevelopment and blighted appearance of the Cove and the severely degraded waterfront, the City recognized an opportunity to advance the community's vision for revitalization of the waterfront areas in a master-planning document. The study area includes approximately 328 acres and extends 7,300 feet along the Willamette River and 8,100 feet along the Clackamas River. Major transportation facilities, I-205, and Highway 99E, generally form the landside boundary of the study area. The limits were created to include the large parcels currently owned by the City, and did not include the southern perimeter parcels near Willamette Falls, which are currently owned by Blue Heron Paper.

The Willamette Falls Master Plan was developed around the concept of connecting Oregon City to its historic waterfront while restoring the area to its former grandeur. The plan highlights open space improvements and mixed use redevelopment within the study area. It identifies opportunities to recreate a fish and wildlife friendly environment and riparian district while balancing recreational activities and encouraging public and private development that is compatible with the community's goals.

Lake Oswego

Until the mid-1800s, Lake Oswego was a sleepy assembly of homesteads and farms between the Willamette and Tualatin Rivers in Oregon. A small population of Native Americans--the Clackamas Indians--had occupied the land, but diseases brought by early explorers killed all but a few. Those who remained ceded their territory to the Federal Government in 1855, and moved to the Grand Ronde Reservation in nearby Yamhill County.

Residential development around the perimeter of Oswego Lake accelerated in the 1940s and '50s. With the annexation of part of Lake Grove to the west in 1960, the name of the city was changed to Lake Oswego. Lake Oswego is now considered one of the finest residential communities in Oregon.

In both 1998 and 2002, citizens passed park bonds to purchase open space and initiate capital improvements to park facilities. Development of parks along the Willamette River is a central focus of this effort.

- Foothills Park, a new 10-acre site along the Willamette River, will feature trails, picnic and play areas, event space, and beautiful views up and down the river.
- George Rogers Park, also along the Willamette River, will receive much needed upgrades to the riverfront, including an accessible pathway and boardwalk, natural area enhancements, creation of view corridors from the park to the river, and restoration of the picnic/barbeque area.

In addition, the City of Lake Oswego developed the East End Redevelopment Plan and Report to guide future development in the area. The plan's goals include:

- To provide for public access to and views of the Willamette River.
- To use City-owned property to attract new development.
- To use public action to encourage the development of certain properties and thereby improve public access to and views of Lakewood Bay, among other goals.

Figure 2 – Kayaks and Canoes Traveling through Willamette Locks

Source: Sandy Carter

Milwaukie

The Milwaukie Downtown Riverfront Framework Plan attempts to reconnect Milwaukie to the Willamette River, knitting together the seam of McLoughlin Boulevard. It creates the new Riverfront Park as the City's "living room." It calls for revitalizing historic buildings while designing new structure to harmonize with the town's historic character. Anchors and attractors are used to build upon existing resources and to strengthen the Main Street "retail armature."

Thus the framework plan is a blueprint to make Milwaukie and its downtown a vital, livable and sustainable community. Milwaukie's waterfront currently contains a wastewater treatment plant at the southern end, at its center is a boat ramp dominated by an asphalt parking lot, and an open space area extends from the ramp north to the mouth of Johnson Creek. McLoughlin Boulevard is the eastern edge of the waterfront and effectively separates it from the downtown area.

Challenges to reconnecting the city to the Willamette River include providing pedestrian and bike access across McLoughlin Boulevard, the current location of a wastewater treatment plant, and a lack of funding.

Along the waterfront, the activity that is expected to have the greatest impact on economic revitalization is the removal of the Kellogg Sewage Treatment Plant on the southern border of the city's waterfront. The property currently occupied by the plant was identified in the framework plan as a prime opportunity for a "catalyst" project such as a hotel and marina complex.

Portland

Home to a quarter of the Willamette Basin's two million people; the City of Portland is by far the largest city on the Willamette River. The Willamette River, which flows through Portland for 17 miles, is the city's defining natural feature. The river is heavily used for a variety of activities. The southern portion is largely used for fishing and recreation. In the north, river-dependent shipping and industry are the predominant activities. The intensely urban stretch of the river in the center of Portland is a focal point for the city.

Portland has made a commitment to restoring the Willamette River's health for the benefit of fish, wildlife, and people. The city's "River Renaissance Vision" calls for a clean and healthy river, a prosperous working harbor, vibrant new waterfront districts and neighborhoods, enhanced access to the river, and new recreational opportunities. Achieving this River Renaissance specifically entails:

- Acquiring lands for new and expanded parks and natural areas
- Creating opportunities for recreational access
- Completing the Willamette River Greenway Trail
- Connecting new and existing neighborhoods to and across the river
- Building a world-class monument along the riverfront
- Reconfiguring the I-5 freeway to unite both sides of the central city and to revitalize the eastside waterfront
- Creating new commercial and residential areas along the river connected by diverse transit options
- Dedicating more of the waterfront to cultural institutions
- Establishing regular events to raise and maintain an appreciation of the river

Relative Importance of History and Recreation

Several key themes form the basis of all of the community plans evaluated in the previous section:

- The importance of the river's history in the development of the region,
- The desire for improved access and connectivity to the river by residents and visitors, and,
- A goal to improve water quality and habitat along the river.

It is important to understand how these themes translate into economic activity in the area.

Cultural Heritage

There is a rich historic context for preserving the Willamette Locks, due to the inter-relationship with historic places throughout the Willamette River Basin. According to Steve Poyser, Statewide Preservation Planner with the Oregon Parks & Recreation Department:

> "Knowledgeable developers understand that historic preservation can serve as an effective economic development tool. Historic resources not only define a community's identity and provide a sense of place, they also draw tourists like magnets[7]".

There are several compelling reasons for developing cultural heritage tourism[8]:

> Cultural heritage travelers spend more money per trip ($615) than the average U.S. traveler ($425), stay longer per trip (4.7 nights) than the average U.S. traveler (3.3 nights), and are more likely to engage in shopping activities (45%) than the average U.S. traveler (33%).
>
> Cultural heritage tourism can drive traffic to areas within the state that previously have been under-visited. The injection of new money that increased traffic brings to a location can further stabilize its economy. In some cases, cultural heritage tourism may broaden the economic base of a rural locale that is dependent on limited agriculture, ranching, and/or natural resource extraction industries.
>
> Cultural heritage expands the menu of attractions that Oregon can offer tourists and thus provides the tourism industry with opportunities to develop new tour packages and regional touring circuits.
>
> Oregon residents derive many benefits from tourist spending at cultural heritage attractions. Successful cultural heritage tourism generates interest in and funding for local historic sites and, through preservation and interpretation of sites, adds value to such locales and the heritage activities that occur within them. Oregonians, therefore, enjoy attractions that document and celebrate their culture and heritage that their own spending might not otherwise support. In turn, cultural heritage tourism can attract new businesses.

[7] Source: Oregon Preservation News.

[8] Source: The Economic Impact of Oregon's Nonprofit Arts Sector, prepared by WESTAF in 2001

Cultural heritage tourism uses the output of feeder industries (food processing, construction, banking, etc.) and thus will stimulate the expansion of those industries.

Cultural heritage tourism, like any industry, generates jobs. While the wages of workers are modest, the cultural sector is responsible for creating jobs for the traditionally disadvantaged: minority groups, women, and youth. As such, cultural heritage tourism provides an avenue for people to gain financial independence as well as contribute to the state's economic growth.

Heritage tourism blends well with the other cultural and recreational opportunities in the Willamette Basin and throughout Oregon and the Pacific Northwest.

Recreation

The need for water-based recreational opportunities is an important component of the Oregon Parks and Recreation Board's Statewide Comprehensive Outdoor Recreation Plan (SCORP). Surveys with state residents revealed a strong demand for water-based recreation, particularly in urban areas.

Table 3 presents the participation rates for the state of Oregon and Regions 2 and 3 (which jointly comprise the Willamette Valley[9]). Key water-related activities include beach activities, fishing from a boat/bank/shore, power boating, canoeing/kayaking, and water-skiing, among other activities.

Regions 2 and 3 jointly represent approximately 72% of the state's population at the present time. The combined area population in these two regions is expected to grow from 2.2 million persons in 2003 to nearly 3.0 million in 2025. The additional population base will place increased demand for water-based and other recreational opportunities.

OPRD reported that needed resources/facilities to meet water-based recreational opportunities included:

- Boating and angling opportunities near residential areas,
- Motorized boat ramps and water-related camping facilities (RV and tent sites), and
- Non-motorized boating facilities for canoes, kayaks and drift boats.

OPRD set a goal to increase motorized and non-motorized water-based recreation activities in appropriate settings. This would facilitate an increase in the number of recreational facilities for, and access to, water-based settings to support the growing demand for boating, fishing and water-based camping. OPRD recognized that all public recreation providers should identify needed water-based recreation facilities and particularly those near residential areas.

OPRD also sought to address the need for water-trails as a part of the statewide trails planning effort. Lack of access to the river, or lack awareness of the available access points, has likely prevented this type of use from reaching its potential.

The Willamette River Water Trail is the goal of a coalition of interest groups and local and state governments working together to improve access to the river. Many of the public properties

[9] Region 2 includes Clackamas, Columbia, Hood River, Marion, Multnomah, Polk, Washington and Yamhill counties. Region 3 includes Benton, Lane and Linn counties.

along the Willamette River are undeveloped, and do not provide an easy way to launch and retrieve kayaks and canoes. In addition, many of the properties are not easily recognized as being public, especially from the water. The first phases of the effort included identifying all of the public property between Corvallis and Newberg, and a map of these properties is now in production. Full development of the water-trail requires that the Willamette Locks continue operating, since it would provide full connectivity to the Willamette River. Governor Kulongoski has stated that promoting recreational use of the Willamette River will boost Oregon's economy and advance its environment, which underscores his support for the proposed Willamette River Water Trail[10]. The first 34-mile leg of the trail is from Buena Vista Park in Polk County to Wheatland Ferry, a few miles downstream of Willamette Mission State Park. Land already in public ownership will enable visitors to rest, eat and camp at designated spots. It is scheduled for completion by Memorial Day.

Table 3 - Recreation Participation Rates for Water Recreation in Oregon and the Willamette Valley (numbers of people)[11]

Activity	Oregon	Region 2	Region 3
Fishing, Activities			
Fishing from a boat	567,000	262,000	99,000
Fishing from a bank or shore	675,000	332,000	92,000
Fishing from a dock or pier	156,000	81,000	19,000
Boating Activities			
Canoeing	136,000	91,000	14,000
Sea kayaking	27,000	20,000	2,000
Whitewater kayaking	37,000	10,000	5,000
Whitewater rafting	103,000	40,000	16,000
Personal watercraft (jet ski, wave runner, etc.)	46,000	20,000	12,000
Power boating for pleasure (excludes fishing and water-skiing)	227,000	151,000	19,000
Sailing	22,000	10,000	7,000
Water-skiing or other towing sport	91,000	50,000	9,000
Windsurfing	25,000	20,000	-
Swimming and Beach Activities			
Freshwater Beach Activities	397,000	201,000	72,000
Ocean Beach Activities	816,000	453,000	147,000
Swimming in an outdoor pool	339,000	171,000	51,000
SCUBA diving or snorkeling	41,000	20,000	2,000

Source: Oregon Parks and Recreation Board, Statewide Comprehensive Outdoor Recreation Plan

[10] Source: Statesmen Journal, February 22, 2005.

[11] Source: Oregon Statewide Comprehensive Outdoor Recreation Plan. The table includes statewide, regional, and out-of-state participation rates for outdoor recreation activities. The Total In-State Population column includes the percentage of the Oregon population that participated in each of the outdoor recreation activities. The regional columns show the percentage of that particular SCORP Planning Region's population that participated in each activity. Finally, the Out Of State column includes the percentage of out-of-state visitors to Oregon included in the survey (sample of 800 non-residents from bordering counties in Washington, Idaho, and California) who had recreated in each of the outdoor activities.

Lock Usage – Historic and Future Perspectives

The following section describes the historical trends and usage of the Willamette Locks and also identifies potential future markets for the Locks.

Freight

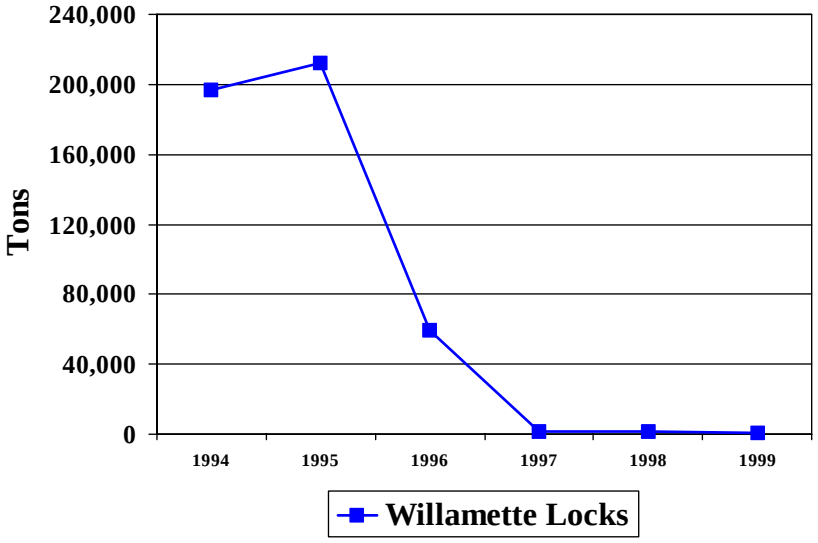
The Oregon and California Railroad Company began laying tracks in Portland in 1868, and heading south on the east side of the Willamette River, crossed the Clackamas River and arrived in Oregon City in 1869. The line was completed as far as Roseburg before being stalled by financial difficulties. As the first rail transport in the state, it opened the Willamette Valley to shipping ports to the north. High rail freight costs, however, resulted in the construction of the Willamette Locks to improve river transport by the Willamette Falls Company in 1872[12].

While river transport did exist prior to the construction of the locks, it was dependent on portaging freight around the Willamette Falls, and was controlled by the People's Transportation Company. The locks were built at a cost of about $600,000, including a $200,000 grant from the State of Oregon. Following construction, three boat companies serviced the region.

Boats traveling through the locks were levied tolls of 50 cents per ton and 10 cents per passenger. As early as 1899 the tolls came to be viewed as an impediment to development of the Willamette Valley, prompting the idea of federal ownership of the locks. The U.S. Army Corps of Engineers finally purchased the lock system in 1915, for a price of $375,000. Since turning over to federal control, no toll has been charged for passage around the Willamette Falls, in keeping with standard Corps procedure.

The waterway opened in 1873 to connect the upper and lower portions of the Willamette River. Usage peaked in 1943, when 2.2 million tons of freight passed.

Figure 3: Willamette Locks Cargo Trends



Source: BST Associates, Corps of Engineers data

[12] The description of the Willamette Locks was taken from work by Oregon City and the Corps of Engineers.

Commodities transported through the Willamette Locks have mainly related to the paper industry. As shown in Table 4, paper and pulp, as well as logs, were the leading commodities handled in the mid 1990's, but by late in the decade these had all but disappeared. Minerals related to the construction industry also moved in substantial volumes on occasion, but Corps records indicate that 1995 was the last major year for these movements.

Table 4: Commodities Transported Through the Willamette Locks (short tons)

Commodity	1994	1995	1996	1997	1998	1999
51 - Paper & allied products	83,983	83,961	30,383	20	-	-
42 - Pulp, waste products	75,346	68,477	27,088	-	20	-
52 - Building cement & concrete, lime, glass	-	46,642	-	-	-	-
41 - Forest products, lumber, logs, woodchips	26,000	-	265	132	125	210
43 - Sand, gravel, stone & crushed rock	-	9,223	-	610	85	215
99 - Other commodity not listed elsewhere	8,648	19	4	-	-	-
53 - Primary iron & steel products, …	-	2,431	1,374	174	483	140
32 - Industrial chemicals	2,541	85	-	-	-	-
Other	-	1,428	-	825	465	328
Total	196,518	212,266	59,114	1,761	1,178	893

Source: BST Associates, Corps of Engineers data

The primary reason for the disappearance of cargo after 1996 was the sale of the paper mill in West Linn. Prior to this time the mill was owned by Crown Zellerbach, which also operated a number of other mills on the Columbia River. Crown Zellerbach had an in-house towboat firm (Western Transportation) that moved material between the different facilities by barge. When the West Linn mill was sold as a stand-alone operation the new owners analyzed their transportation needs and concluded that moving material by truck would provide substantial cost savings, and ceased using barges. Since barge traffic related to this mill provided the bulk of the traffic moving through the locks, the change in transportation modes is reflected in Figure 3 and Table 4.

In addition to the traffic related to the West Linn Paper mill, sand and gravel for the construction industry also moved in substantial volumes at one time. However, according to Tom Bernert of Joe Bernert Towing, the company at one time marketed their aggregates in Portland, but has not barged any through the locks in a number of years.

Paper Mills

Two mills are located adjacent to the Willamette Falls and Willamette Locks, Blue Heron Paper on the Oregon City side of the river and West Linn Paper on the West Linn side. Both of these mills have long histories at the location, and both plants have continued to invest money to keep their plants modern.

The Blue Heron mill in Oregon City started in 1908 as the Hawley Pulp and Paper Mill. The mill originally produced a variety of paper products including fruit wrap, bread paper, wrapping paper, toweling, bags and newsprint. In 1948 Hawley Pulp and Paper was purchased by Times Mirror (publishers of the Los Angeles Times) and the name of the mill was changed to Publishers Paper Company, and later to Jefferson Smurfit. In 2000 Smurfit sold the mill to its employees and KPS, creating the Blue Heron Paper Company.

The mill became the first in the Pacific Northwest to reclaim old newspapers with the addition of a de-inking plant in 1975, and newspapers and magazines now comprise over half of the raw materials fed into the plant. The grades of paper produced here include newsprint, high bright specialty papers and bag papers.

Paper has been manufactured at the West Linn site since 1889, making it the oldest in Oregon. The plant started in 1889 as the Willamette Pulp and Paper Company, then later merged with Crown-Columbia Paper Company to form the Crown-Willamette Corporation. This firm then merged with the Zellerbach Paper Company of San Francisco to form the Crown-Zellerbach Corporation, which went on to become one of the giants in the paper-making industry. The mill was sold a number of times, becoming the West Linn Paper Company in 1997.

Figure 4: Paper Mills at Willamette Falls
(Blue Heron Paper on Left, West Linn Paper on Right)

Source: BST Associates

The product mix today is very different from the original start up operation. In the early 20th century, the facility manufactured commodities including newsprint, gun cotton, and creped toweling, but now produces high quality coated paper for use in magazines, catalogs and books.

According to the operations manager at the Oregon City mill (Blue Heron Paper), the mill has not used water transportation for raw materials or finished products for forty years or more. The only time that the ability to move a barge into the area has proven helpful is when floating logs and debris have built up around the intake to the mill's hydroelectric plant, and this has not happened in a number of years.

Across the river at West Linn, barge transportation was at one time important to the mill. However, barge transportation has not been used to move materials in or out since the plant was reopened as West Linn Paper in 1997. This coincides with the decline in cargo volumes shown in the Corps of Engineers data.

It appears unlikely that this type of industrial traffic will transit through the Locks in the future. However, barges are occasionally used by West Linn Paper Company to provide additional support to the trestle that crosses the canal and connects the two sections of the paper mill.

Portland General Electric (PGE)

PGE owns and operates the hydro-electrical facility at Willamette Falls. First operated in 1895, the T.W. Sullivan Plant is Oregon's oldest hydro project, with thirteen turbines generating enough electricity to power about 11,000 homes.

Figure 5 – Photo of PGE's Sullivan Plant at Willamette Falls[13]

Source: PGE

The earliest attempts to harness the power of Willamette Falls reportedly occurred in the 1830s at the direction of John McLaughlin, the "Father of Oregon." Various small timber crib dams apparently ran water wheels for lumber, flour and woolen mills over the following five decades.

As the U.S. entered the electric age, the 30 to 40 feet of water height, or "head" at the falls, was a natural for power generation and the location was promoted as the "Niagara Falls of the West." Using generators originally used in a Portland sawmill, the Willamette Falls Electric Company produced the nation's first long distance transmission of electricity on June 3, 1889. Power traveled from Station A in Oregon City, 14 miles to the streetlights in Portland. That company, now known as Portland General Electric, officially dates its corporate history from that moment. Station B (now called T.W. Sullivan) opened on the West Linn side in 1895. PGE closed Station A in 1897, but the Sullivan plant continued operation.

Today, with plant upgrades and environmental protections, Sullivan's low-cost reliable electricity remains an important source of power for all 754,000 PGE customers. In 1953, the renovated facility was renamed after its designer, Thomas W. Sullivan, a PGE hydraulic engineer from 1890 until his death in 1940. In 2002, the plant became eligible for the National Register of Historic Places because of its role in the industrialization of Oregon. It is an original inductee to the Hydropower Hall of Fame.

PGE has recently undertaken a Relicensing effort with the Federal Energy Regulatory Commission (FERC) to continue operations at the Sullivan Plant for the next 50 years. The key elements of the Relicensing plan agreement include:

[13] Source: PGE website

- Provide more environmental protection while potentially increasing electricity production,
- Improve passage through the falls area for salmon, steelhead and other fish.
    - Gated opening (flow structure) to be added at top of falls to move fish downstream
    - Water tunnel to be modified to become additional downstream fish bypass around generating plant
    - PGE to assume maintenance of the state-owned fish ladder and will make necessary improvements
    - Other steps, including reducing predation of fish by other animals and better trash rack cleaning at the Sullivan plant
    - Downstream fish survival through plant forecast at 98 percent or better, an all time high
- PGE will research Pacific lamprey to better understand the impact of the facilities on these fish and facilitate their harvest at the falls by Native Americans. Lampreys are a fascinating species that actually climb the falls as they migrate upstream from the ocean. They use their sucker-like mouths to attach themselves to the rock walls before jumping higher elevations.
- New turbines ("runners") will be installed on 10 of 13 generators, improving reliability and reducing maintenance costs for PGE customers.
- PGE purchased the water rights to Blue Heron Paper Co.'s hydroelectric plant at the falls and began retiring the plant in August 2003. This frees more river water for Sullivan's energy production and provides additional downstream fish protection.
- PGE will fund $500,000 in cultural, historical and education opportunities during the life of the license. The details will be determined by PGE in consultation with key stakeholders, including tribes, community groups and historical organizations.
- Fish protection features at Sullivan are the result of a signed collaborative agreement between PGE and 12 government agencies and environmental organizations and tribal interests.

The timeline to accomplish these efforts runs from 2004 to 2010, when work should be completed. The existence of the Locks enables PGE to accomplish some of the work planned during the next four to five years.

Construction

Joe Bernert Towing in Wilsonville operates a fleet of 4 derrick barges, 5 flat barges, and 8 tugboats. Bernert is primarily engaged in dredging aggregates from the river channel for use as construction material, but also performs a small amount of contract construction work. The company at one time marketed sand and gravel in Portland, but no longer moves material through the Willamette Locks.

The firm's primary use of the Willamette Locks is to move equipment downstream to shipyards for sandblasting and painting. Alternative sites for doing this work are very limited. All but one of the tugs can be lifted with company derricks onto a flat barge for sandblasting and painting, but this is not feasible for the remaining tug, or for the barges. Not doing the work will shorten the life of the equipment; because each vessel has been repainted every five to six years, they have each been able to last 30 to 40 years, and there is no end in sight. Each painting costs

approximately $15,000 to $30,000. Lack of access to a repair yard in Portland would require development of a boat yard in the upriver area, which could be used by Bernert and other vessels.

Figure 6: Waterfront Construction at Oregon City

Source: BST Associates

Most of the towboats in the Bernert fleet draw three to four feet of water, while barges draw from 1½ feet when empty to 8 feet when loaded.

The other construction company that uses the Willamette Locks is owned by Eric Dye, and is based in Oregon City below the falls. The firm is the primary builder of residential and commercial docks on the Willamette River above Portland; approximately half of the docks it completes are above the locks and half below.

The company builds the dock floats at its site in Oregon City, then barges the assembled dock to its final destination. A barge is also used to drive pilings for the docks

Permanent closure of the locks would present a difficulty to Dye. The alternative to barging dock assemblies to final sites above the locks would be to truck the individual components, then assemble them on site. However, this is dependent on having enough room at the site to assemble the dock. In addition, the only alternative means for driving pile is to sub-contract the work to Bernert. This method has been used in the past, but creates difficulties in scheduling. Another alternative would be to station a second set of equipment above the locks, but this option does not make financial sense.

Passenger Ferries

As noted previously, there are three passenger ferries upriver of the Locks, including the Wheatland, Buena Vista and Canby ferries.

Canby Ferry

The Canby Ferry (The M.J. Lee), which is owned and operated by Clackamas County, crosses the Willamette River between Canby and Wilsonville seven days a week from 6:45 a.m. to 9:15 p.m. The ferry has space for nine cars. The ferry provided service for 217,210 vehicles in 2003.

The cost to operate the ferry was $328,000 in 2003, with farebox revenues accounting for about 25% of costs.

The charges for the ferry are as follows:

- Pedestrians and Bicycles FREE
- Motorcycles $0.50
- Car or Pickup $1.25
- Car or Pickup with Trailer (Combined Length Over 20 Feet) $2.50
- Truck or Bus with Dual Wheels (Combined Length Over 20 Feet) $2.50
- Truck with Dual Axle $2.50
- Large Oversize Vehicle Using three Car Spaces $3.75
- Large Oversize Vehicle Using Entire Ferry $5.00

The ferry[14] was purchased in July 1914 by Canby Mayor W.H. Bair and by Harry B. Evans, representing the Canby Business Men's Club. It was propelled by a splashboard driven by the river current and held on course by a cable. The first ferryman was Clem Dollar who received $10 a month from the City of Canby to run the ferry. A second ferry was built in 1917 by Frank E. Dodge, Canby builder. The ferry operated continuously until 1946 and was inactive from 1946 - 1953: In 1952, the Canby Chamber and Lions Club presented the Clackamas County Court with 8,000 signatures seeking restoration of ferry service. In November 1952, a new ferry was launched at Baier's plant and christened by Ora Lee Cattley, daughter of Canby's first mayor, Herman A. Lee, and grand-daughter of Philander and Anna Green Lee who settled in the Canby area in 1847. The ferry was named for Millard Jerome Lee, first child born (1872) in the 1870-platted town of Canby. In 1997, the Clackamas County Commissioners and the Canby community celebrated the reopening of ferry service with the existing vessel, which was christened the M.J. Lee II by Doris Cattley Martin, descendent of M.J. Lee.

The characteristics of the M.J. LEE are:

- Length Overall: 55'8"
- Length at Waterline: 53'2"
- Beam Overall: 36'
- Cruising Speed: 6.4 mph
- Passenger Capacity: 49
- Vehicle Capacity: 9 autos or 25 tons
- Propulsion: Two 75 HP Z-Drives

Wheatland Ferry

The Wheatland ferry is located approximately one mile north of the Yamhill–Polk county border. The Wheatland Ferry, which links Marion with Yamhill and Polk counties, operates every day (except holidays and low water days[15]) from 5:30 A.M. to 9:45 P.M. The ferry has space for nine cars. The ferry provided service for 234,000 vehicles in 2004. The Wheatland ferry had operating costs of $350,000 in 2004, with farebox revenues accounting for 85% of costs.

[14] Source: Clackamas County website, with attribution to Myra Weston, Canby historian

[15] Closes when the river level reaches 16 feet.

According to the Mid Willamette Valley COG, Regional Transportation Systems Plan[16]:

> "The Wheatland Ferry is mutually owned by Marion and Yamhill counties and is operated by Marion County. The ferry is located about two miles north of the SKATS area near the Willamette Mission State Park. The ferry mechanical system consists of two on-board electric motors that drive two propellers. Electrical lines suspended across the river connect to the ferry providing the needed electricity. A separate steel cable system suspended overhead is used to keep the ferry in its appropriate travel path. The previous Wheatland Ferry could carry a maximum of six automobiles and 30 passengers at a time and operated seven days a week. The new Wheatland Ferry can carry nine vehicles and approximately 42 passengers per trip. The maximum wait time for the ferry is 10 to 15 minutes, depending on the number and types of vehicles to be loaded off and onto the ferry. In fiscal year 1994, the ferry transported an average of 610 vehicles per day across the river. Using fiscal year 1999 data, and based on 328 operating days, the ferry transported an average of 447 vehicles per day across the river. The ferry is in service all year long depending on the weather and equipment conditions".

The charges for the ferry are as follows:

- Bicycles - Free
- Motorcycles - $1.00
- Auto & Pickup - $1. .35
- Vehicles w/trailers - $2.75
- Vehicles over 20 feet - $2.75
- Dual axle vehicle- $4.00
- Vehicles using entire ferry $12.00

Figure 7 – Photo of Wheatland Ferry

Source: Marion County

[16] Source: Mid Willamette Valley COG, Regional Transportation Systems Plan, revised in 2003.

Buena Vista Ferry

The Buena Vista ferry, which is located just north of where the Santiam River flows into the Willamette River, is operated by Marion County. The ferry provided service for 8,000 vehicles in 2004. The ferry had operating costs of $95,000 in 2004, with farebox revenues accounting for 10% of costs. According to the Mid Willamette Valley COG, Regional Transportation Systems Plan[17]:

> "The Buena Vista Ferry is located about five miles south of the SKATS area, just north of where the Santiam River flows into the Willamette River. The ferry is owned and operated by Marion County. The ferry mechanical system consists of an on-board diesel generator that provides the electricity needed to run the on-board electric motors. The electric motors drive the propellers, and overhead suspended steel cables are used to keep the ferry in its appropriate travel path.
>
> The Buena Vista Ferry can carry a maximum of four automobiles and 29 passengers per trip, and operates five days a week from May through September. The maximum wait time for the ferry is 10 to 15 minutes depending on the number and types of vehicles to be loaded off and onto the ferry. This ferry does not operate between the months of October and April. In fiscal year 1994, the ferry transported an average of 56 vehicles per day during the days it was open. For the 1999 fiscal year, and based on 131 operating days, the ferry transported an average of 65 vehicles per day across the river. The daily operation of the Buena Vista Ferry is funded by monies received from three different sources: Marion County, ODOT, and farebox revenues. An agreement in place since 1990 between ODOT and Marion County splits the operating costs remaining after farebox revenues."

Figure 8 – Photo of the Buena Vista Ferry

Source: Marion County

[17] Source: Mid Willamette Valley COG, Regional Transportation Systems Plan, revised in 2003.

Passenger Vessels

A number of passenger vessels currently operate on the Willamette River, primarily below the Willamette Locks, but also upriver in the vicinity of Salem. These vessels have not been major users of the locks in the past, but their operators view boat cruises through the locks as having great potential.

One of the vessels that currently operates out of Portland is the Sternwheeler Rose, an 80-foot sternwheeler with capacity for 129 passengers. This boat is currently very busy operating charters out of Portland, as well as occasional dinner cruises. In addition, the vessel operates occasional cruises from Oregon City. The firm that owns this vessel is actively looking for a second vessel, and plans on offering more frequent sailings from the new Oregon City dock when it is complete.

Paul Simonis, Captain of the Sternwheeler Rose, would like to operate a tour once offered in the 1950's. At that time, it was possible to ride a boat from Portland through the locks and upstream to Champoeg State Park, where a salmon barbecue was offered. Passengers were then bussed back to Portland. Passengers were also bussed to Champoeg, and then taken back to Portland by boat. Captain Simonis imagines that this trip could be offered two to three times per week; however, this is dependent on the locks still operating.

Another passenger vessel operating on the Willamette is the *Willamette Queen*, a twin-paddle wheel riverboat sailing from downtown Salem. This vessel operates daily lunch, dinner, and excursion cruises, as well as weekend brunch cruises, and most of the sailing is done in the vicinity of Salem. The vessel seldom sails far downstream of Salem, due to shoals and other channel limitations. However, the *Willamette Queen* does need the Willamette Locks in order to reach a drydock in the Portland area for required hull inspections.

Although this inspection is only required every five years, not having the inspection could make the vessel unusable for carrying passengers. There are no alternative facilities available above the locks. The only options would be to find a flat, riverside site that the vessel could be pulled out of the water on some sort of trailer. However, finding such a site might be impossible, and if a site were found, the operation might prove to be too costly. Other possible solutions might be the granting of an exemption from the Coast Guard, or paying trained divers to inspect the hull.

Salem is also home to George Hutmacher, who operates an airboat up and down the river. Underway this boat needs only inches of clearance, and is able to operate virtually anywhere in the river. The boat is typically chartered out to six passengers per trip, and operates both upstream and downstream of Salem, as well as in back channels and sloughs. This vessel sails between May and September, and beginning in the summer of 2005 will operate from the new dock in Salem.

The airboat has been operated up to the locks before, but never through the locks. Hutmacher has considered operating through the locks, but a trip to Portland would take as much as eight hours, and he does not see sufficient demand.

Another type of tour boat operated on the Willamette River is jet boats. Willamette Jetboat Excursions operates three 60-passenger boats from OMSI in downtown Portland, with a season that runs from May 1 to October 10. Scheduled trips include a one-hour bridge tour in Portland, and a two-hour tour that runs from Portland to the base of the Willamette Falls. The vessels are also available for charter trips.

Willamette Jetboat does not currently offer trips that pass through the Willamette Locks. However, the firm has proposed a day-long tour that would depart from the Oregon City dock, drop passengers off at the locks for a tour, pick them back up for the last part of the locks passage, then go up river to Champoeg State Park. From the park the passengers would be bussed to agricultural tourism sites in the area. In addition, on the existing two-hour tours the boats go into the lowest lock chamber, and the personnel operating the locks describe operation of the locks to the passengers.

Fishing Charters

A number of fishing guides offer fishing trips in the vicinity of the Willamette Falls and Willamette Locks. Interviews with guides suggest that closure of the locks would probably not cause serious hardship.

Typically, guided fishing trips in the area take place either above or below the locks, but do not involve a transit of the locks. The particular location depends on the species being fished: the Willamette River below the falls and the lower Clackamas River are popular for salmon and steelhead, while above the falls other species tend to be more popular.

The boats used by fishing guides are typically between 20 feet and 25 feet in length, a length that is relatively easy to trailer. These vessels hold between four and six customers who pay approximately $140 to $150 per day. Launch sites in the immediate area include Clackamette Park and Sportcraft Landing below the locks in Oregon City, and Bernert Landing above the locks in West Linn, all of which are located near the desired fishing areas.

Another reason that the locks have little impact on guided fishing is that fishing season around Oregon City is relatively short, and occurs during a time of year when the locks have not operated during the past few years. In general, the local season runs from early April until mid May.

Recreational Vessels

Power Boats

The type of recreational boat that currently uses the Willamette River in the vicinity of the Willamette Falls tends to be relatively small. There are a number of reasons for this, but the result is that there has not been a high demand for use of the locks by recreational vessels in the past, typically between 400 and 600 per year.

According to interviews with boaters, the three primary reasons that larger recreational vessels have not been common in the locks is that the channel upstream of the locks is thought to be too shallow (true, above Newberg), there are relatively few moorage facilities for these vessels (this is changing), and the recreational opportunities are not well known.

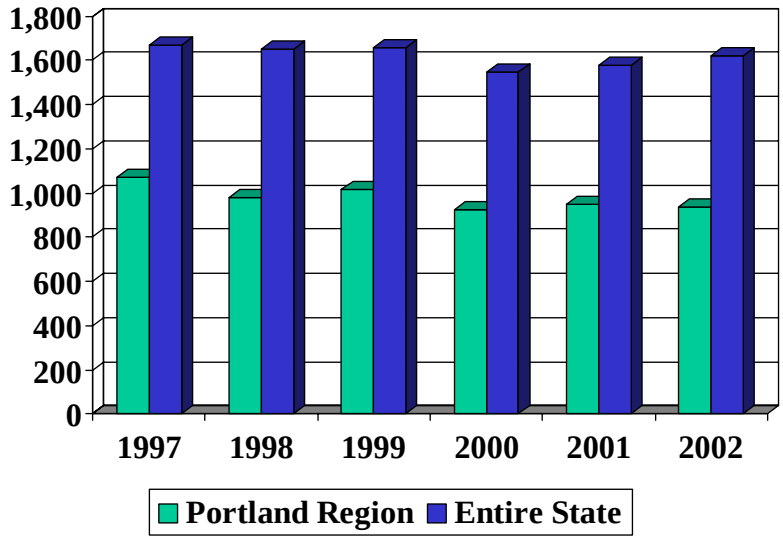
As described earlier in this document, the channel is navigable above the locks, as far upriver as Newberg. As mentioned above, the tug and barge fleet operated by Tom Bernert Towing is active in this stretch of the river with vessels that draw up to eight feet when loaded, so it is possible that larger pleasure boats could also navigate this section. Above Newberg, however, the channel is much less predictable and would be difficult for larger vessels to navigate

From Newberg downriver the channel is also well marked, and, according to river users interviewed for this report, the Coast Guard recently performed extensive work on the channel markers.

The perceived lack of facilities may be a problem, but one that is changing. According to a yacht club spokesman, most of the larger boats are moored near the confluence of the Willamette and Columbia Rivers. These vessels are often used for day trips up the Willamette as far as downtown Portland, where there are numerous dining and entertainment possibilities. However, upstream of downtown Portland there are few such opportunities. Examples of recreational activities currently available above Portland include dining at the Ram restaurant in Lake Oswego, which is located on the Willamette River adjacent to a transient dock that boaters can use, and touring historic sites in Oregon City by using the new Oregon City dock. The creation of additional activities such as these both above and below the locks could stimulate increases in the number of recreational vessels passing through the locks.

Another reason for the lack of larger recreational vessels is that the owners of these vessels are not aware that boat-accessible recreational activities opportunities are available upriver of Portland, or are not aware that recreational boats are allowed to use the locks, or are not even aware that the locks exist.

Figure 9: Recreational Fleet of Boats Over 27' Long



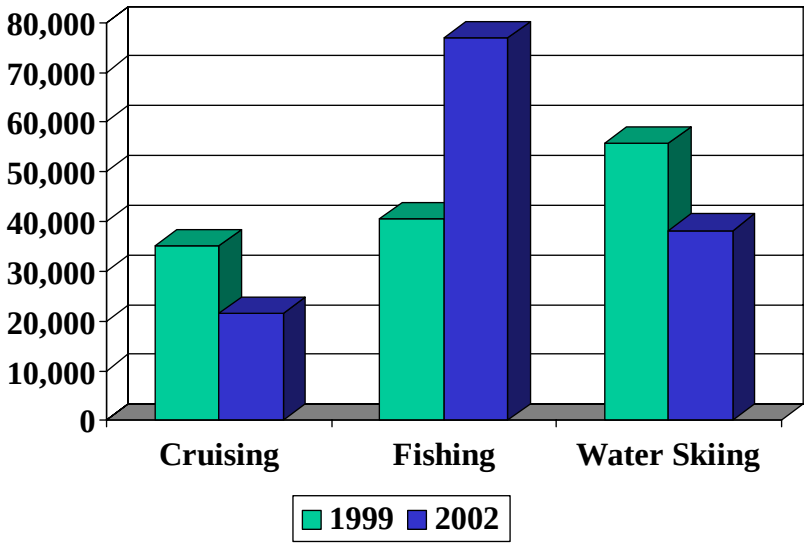
Source: BST Associates, Oregon State Marine Board data

The types of boats most common in the vicinity of the Willamette Locks are those that can be hauled on a trailer. According to registration data from the Oregon State Marine Board, the number of boats that are too large to trailer (primarily those boats longer than 27 feet) has not been increasing. Both statewide and in the Portland region the registration statistics show that the number of boats 28 feet and longer actually decreased slightly between 1997 and 2002.

According to the Oregon State Marine Board, the most popular boating activities on the Willamette River in Clackamas County include fishing, water skiing, and cruising. The types of vessels used for these popular activities tend to be those that can be trailered. According to this

data, the most popular boating activities on the Willamette River in Clackamas County are fishing and water skiing. In the 1999 survey more respondents were water skiing than fishing, but in 2002 the reverse was true. This fluctuation was likely due to different weather and/or river conditions. Cruising was the third most popular activity listed, but had fewer participants that skiing fishing in both 1999 and 2002.

Figure 10: Boating Activity Surveys



Willamette River in Clackamas County

Source: BST Associates, Oregon State Marine Board data

Canoes and Kayaks

As mentioned in the previous section, canoeing and kayaking are experiencing sustained growth.

Figure 11: Kayaks at the Willamette Locks

Source: Willamette Riverkeeper

In time, the entire River can become a 187-mile long trail, creating a new recreational, economic, and environmental asset for all Oregonians.

According to the publication *Economic Impacts of Protecting Rivers, Trails, and Greenway Corridors*, these types of amenities "are traditionally recognized for their environmental protection, recreation values, and aesthetic appearance. These corridors also have the potential to create jobs, enhance property values, expand local businesses, attract new or relocating businesses, increase local tax revenues, decrease local government expenditures, and promote a local community." In addition to these benefits, another hope of the group is that the increased awareness of the river that the Water Trial will create will lead to more of a constituency for the river.

Canoes and kayaks are obviously small enough to be transported by vehicle around the falls and locks. However, portaging overland around the Locks on foot is not feasible, because it involved a walk of two miles or more.

Future Use by New Users

Tourism Potential

Nearly everybody interviewed for this report expressed the belief that the Willamette River and the Willamette Locks present a great opportunity for tourism, but that this opportunity is in its early stages of development. The consensus seemed to be that the Willamette River has largely been ignored as an asset for recreation and tourism by the general public, and has instead been regarded as an industrial waterway used for transportation, irrigation, and industrial processing. However, that view appears to be changing.

One of the factors changing the public opinion of the river is the increasing ability of the public to access the river. A series of trails is being constructed that will eventually allow bicyclists and pedestrians to travel from the Columbia River upstream past the locks to Wilsonville, and eventually all the way to Eugene. Oregon City recently had a ground-breaking ceremony for the start of construction of the section through that city.

The development of the bike trail and water trail are two compatible projects, and the development of one can help the development of the other. For example, creation of bike and pedestrian pathways along the shoreline can also create access points for paddlers and other boaters to reach the river. At the same time, the landside path can provide opportunities for paddlers following the water path to enjoy other activities on shore.

The growth in the wine industry in the Willamette Valley has provided a major impetus to the tourism industry, and presents a potential tie to the tour boat and charter boat industry. The north end of the Willamette Valley wine region is Yamhill County; Yamhill County is also the location of Newberg and the end of the navigable portion of the Willamette River. Yamhill County is home to 81 wineries, many of which are very close to Newberg.

Overnight Cruising

One potential tourism concept is the bareboat chartering of canal boats or houseboats. Bareboat charters are rentals of vessels that come equipped with everything but a crew. Rentals of this type of canal boat are quite popular in the United Kingdom and elsewhere in Europe, and are growing in popularity in the United States and Canada. For example, a number of firms now offer bareboat charters of canal boats on the Erie Canal, Rideau Canal in Ontario, and the Trent-

Severn Waterway in Ontario, as well as extensive canal travel in Europe and other parts of the world.

Figure 12: Erie Canal Charter Boat

Source: Low Bridge Charters

In addition to Canal Boats, houseboats rentals are popular in the west, on water bodies such as Lake Roosevelt in Washington, Lake Billy Chinook in Oregon, Lake Shasta in California, Lake Mead in Nevada/Arizona, and Lake Powell in Utah.

The type of houseboats used on the big lakes typically sleep between 10 and 14 passenger, and rent for between $2,400 and $5,000 per week, although extended weekend (three night) options are available. These boats are typically rented between May and October.

The Canal boats on the Erie Canal are also typically rented for one-week periods between May and October. They provide sleeping accommodations for four to six people, and rent for between $2,000 and $2,400 per week. A typical week's itinerary might take the boat 100 miles from the rental location and back.

The 100-mile figure compares favorably with the distance between Portland and Salem. According to the NOAA chart information, Salem is located 85 miles from the mouth of the Willamette River. However, a comparison of the Erie Canal channel and the Willamette River channel is less favorable. As discussed above, the Willamette River channel between Newberg (approximately mile 50) and Salem is winding and contains numerous shoals, and conditions do not improve between Salem and Eugene. The Erie Canal is neither winding nor littered with shoals.

One of the selling points of canal boat travel both in the U.S. and in Europe is the availability of public docks and parks where tourists can tie up their boats to go exploring ashore, or to spend the night.

The development of both the water trail and the bike/pedestrian trail along the Willamette River could be used to provide additional locations for tourists traveling via canal boat to access recreational opportunities on shore. For example, a boat could dock in Newberg then use bicycles to reach some of the many nearby wineries. Another example is Grape Escape Winery Tours, a local business that picks up customers at any location and drives them to wineries; passengers on Canal Boats could arrange to meet Grape Escape at a dock for a day of touring. The Oregon Gardens, Champoeg State Park, and other local attractions could also provide shoreside entertainment for boat travelers.

Economic Impact Analysis

This section presents the existing costs of operating the Willamette Falls Lock and the economic impacts associated with keeping the Lock open.

Annual Costs

The annual operations and maintenance of the Willamette Falls Lock is presented in Table 5. The annual costs ranged from less than $200,000 to as much as $1.3 million per year (during which time some deferred maintenance was addressed).

During the past three years, operations were reduced and annual expenditures averaged $224,000. In 2004, hours of service were as follows:

- Limited basis between April 5th and April 30th (operating from 8am to 11am Monday through Friday, closed afternoons and weekends)
- Extended lock hours began on May 1 continuing through September 30th (operating from 10am to 8pm, 7 days per week).

This system was generally acceptable for users. It is expected that if the locks are re-opened, this procedure would be re-instated and it is reasonable to assume that the annual operating costs may be approximately $224,000 per year.

Table 5 – Willamette falls Lock Operation/Maintenance Costs

Year	Amount
1994	$1,253,840
1995	$745,193
1996	$1,242,935
1997	$696,184
1998	$865,491
1999	$498,267
2000	$553,632
2001	$1,336,314
2002	$175,897
2003	$208,029
2004	$288,805
Average – full period	$714,962
Average - last three years	$224,244
Estimated deferred maintenance	$200,000
Total expected annual cost	$424,244

Source: U.S. Army Corps of Engineers

In addition, there has been an unknown amount of deferred maintenance. In 2001, the USCOE estimated maintenance over the previous years was $300,000 per year. This analysis assumes

$200,000 of additional maintenance/replacement costs per year upon re-opening. However, this estimate should be re-evaluated if the project proceeds. Needed repairs include:

- Repairs to miter gate anchoring and trunion supports.
- Repair to guide walls. Note the holes in portions of the wooden guide walls.
- Upgrading the auto control system for level control of the chambers.
- Maintenance/repair of the two largest gates.

The full cost may be on the order of $424,000 per year, including both O&M costs and deferred maintenance.

Figure 13 – Boats Traveling through Willamette Locks

Source: Sandy Carter

Economic Impacts

The economic impacts associated with re-opening the lock is presented below.

Projected Usage

As shown in Table 6, the projected usage of the Lock is between 1,192 boats (low) and 2,716 boats (high). This is low compared with historical standards during full operating schedules but higher than in 2001, which had a limited (partial year) operating schedule:

- In 1997, 4,500 commercial vessels and 2,900 recreational vessels used the locks.
- In 1998, 500 commercial vessels and 2,900 recreational vessels used the locks.
- In 2001, 950 recreational vessels used the locks.

Table 6 – Estimated Use of the Re-Opened Willamette Falls Lock

	Annual Lockages		Annual Passengers	
Category	**Low**	**High**	**Low**	**High**
Existing Users				
Marine Construction	20	40		
Ferries/upriver passenger boats	2	2		
Subtotal	22	42		
Recreational boats				
Motorized	500	1,000	1,000	2,000
Self-powered	300	1,000	600	850
Subtotal	800	2,000	1,600	2,850
Passenger boats				
Jet boats	50	74	3,000	4,440
Stern wheelers	80	120	8,000	12,000
Subtotal	130	194	11,000	16,440
Total Existing	952	2,236	12,600	19,290
Future Users				
Canal boats	240	480	720	1,440
Total existing & Future	1,192	2,716	13,320	20,730

Source: BST Associates

This expected level of usage would result in passage by an estimated 13,320 passengers (low) and 20,730 passengers (high). This is based upon the following assumptions:

- Motorized recreational boat – 2 persons per boat
- Non-motorized recreational boat – 1.2 (low) to 1.7 (high) persons per craft
- Jet boats -30 persons per lockage
- Stern wheelers – 100 persons per lockage
- Canal boats – 3 persons per lockage

Economic Impacts

Economic impact analysis is used to estimate the effect on an economy of a given project. Economic impacts are typically grouped into three types: direct, indirect and induced, each of which is described below.

- Direct Impacts. These are the economic activities directly caused by the lock operations. They represent the "first round" of spending, employment and wages.
- Indirect impacts - the rounds of inter-industry purchases and related employment required to support the direct economic activities.
- Induced impacts refer to the household purchases based on the employment earnings from direct and indirect economic activities. As wages are paid out, workers' families spend their income on a wide array of goods and services, much of which are supplied by the local economy.
- Total impacts - incorporates the sum of direct, indirect, and induced impacts, and is limited for any region because of spending "leakages" at each round of inter-industry and household purchases. That is, the goods and services required at each stage are partly purchased from outside the study area, thus reducing the total supplies provided locally.

Table 7 presents the expected economic impacts (direct and total expenditures) associated with operation of the Willamette Falls Locks:

- Existing users - Direct expenditures by existing lock users are expected to range from $828,000 (low) to $1.6 million (high). Considering indirect and induced multiplier effects, the total expenditures are estimated to be $1.5 million (low) to $2.9 million (high).
- Future potential users - Direct expenditures by future lock users are expected to range from $480,000 (low) to $960,000 (high). Considering indirect and induced multiplier effects, the total expenditures are estimated to be $857,000 (low) to $1.7 million (high).

Table 7 – Economic Impacts Associated with Lock Operations

	Direct Expenditures		Total Expenditures	
Category	**Low**	**High**	**Low**	**High**
Existing Users				
Estimated Repair Costs				
Upriver Boats (ferries, pass. vessel)	318,000	741,000	647,000	1,507,000
Recreational boats				
Motorized	65,000	129,000	108,000	214,000
Self-powered	5,400	26,000	9,000	43,000
Subtotal	70,400	155,000	117,000	257,000
Passenger boats				
Jet boats	120,000	178,000	214,000	318,000
Stern wheelers	320,000	480,000	571,000	857,000
Subtotal	440,000	658,000	785,000	1,175,000
Total Existing	828,400	1,554,000	1,549,000	2,939,000
Potential Future Users				
Canal boats	480,000	960,000	857,000	1,713,000
Total existing & Future	1,308,400	2,514,000	2,406,000	4,652,000

Source: BST Associates

The expected economic impacts (income and employment) associated with operation of the Willamette Falls Locks are:

- Direct earnings from existing and future potential impacts are expected to range from $247,000 (low) to $475,000 (high). Considering indirect and induced multiplier effects, total income is estimated to be $472,000 (low) to $912,000 (high).
- Direct employment from existing and future potential impacts is expected to range from 7 full-time equivalent jobs (low) to 13 full-time equivalent jobs (high). Considering indirect and induced multiplier effects, total employment is estimated to be 14 jobs (low) to 28 jobs (high).

These estimates are based upon the following assumptions:

- Expenditures:
  - Existing boats requiring repair services – assumes a boat repair yard[18] would be developed in the affected area upstream of the Locks to service the passenger

[18] The options for the four affected boats include terminating service (which would lead to significantly increased travel costs or provision of one or more bridges) or establishing a new repair facility above the Locks capable of

ferries, passenger vessel and marine construction equipment. It is expected that this facility would need revenues of $317,000 to $741,000 per year to be sustainable, based upon data for existing Oregon State boat yards.
    - Motorized recreational boat – direct expenditures of $129.46 per party day for day trip use by boats longer than 26 feet, traveling within 30 miles of home (see Table 8).
    - Non-motorized recreational boat – direct expenditures of $15 per person[19]
    - Jet boats - direct expenditures of $40 per person[20]
    - Stern wheelers - direct expenditures of $40 per person[21]
    - Canal boats - direct expenditures of $2,000 per person[22]
- Earnings
    - Tourism – based upon payroll per expenditures and average wage per job (see Table 9)
    - Boat repair – based upon data from Oregon Employment Department
- Employment
    - Tourism – based upon average payroll per job (see Table 9)
    - Boat repair – based upon data from Oregon Employment Department
- Multipliers:
    - Recreational boat impacts based upon U.S. Army Corps of Engineers study (see Table 10)
    - Passenger boat impacts based upon US Bureau of Commerce RIMS multipliers for Oregon State (see Table 11)

Conclusion

The estimated cost of operating the Willamette Falls Lock is approximately $424,000 per year compared with an annual benefit to the State of between $1.5 million (low) to $2.9 million (high). This implies a benefit/cost ratio of 3.7 (low) and 6.9 (high) considering existing users. The benefit/cost ratio increases to 5.7 (low) to 11.0 (high), if potential future users are included (i.e., canal boats).

accommodating the four boats. The cost of operation of the repair yard is considered the least cost alternative.

[19] Source: Economic Impacts of Protecting Rivers, Trails and Greenway Corridors, Table 5-3, identifies canoeing on St Croix River (Maine) with expenditures of $15 per person per day.

[20] Source: discussion with jet boat operators

[21] Source: discussion with stern wheeler operators

[22] Source: discussion with canal boat operators

Table 8 – Expenditures by Recreational Boaters ($ spent by size of boat and type of trip)

	Under 16'		16 to 26'		26' and Larger	
Category	**Day Trip**	**Overnight**	**Day Trip**	**Overnight**	**Day Trip**	**Overnight**
Per Party Day Spending, Within 30 Miles of the Port						
Hotels, motels, cabins, B&B		3.6		11.23		17.75
Campground fees		12.92		8.96		4.57
Restaurants	27.69	12.76	27.06	17.33	22.98	24.45
Groceries	27.69	10.88	27.95	14.59	20.42	20.41
Gas and oil for auto, boat, RV	30.62	6.3	31.11	15.72	24.58	25.99
Other auto expenses	0.77	0.85	4.53	2.14	10.72	2.53
Other boat expenses	44.46	3.27	39.23	11.94	32.72	19.51
Recreation and entertainment fees	7.69	3.34	1.24	2.41	1.35	3.86
Sporting goods	53.08	4.74	24.05	6.86	11.92	9.71
Other expenses	7	4.3	4.27	4.51	4.77	7.19
Total spending	$199.00	$62.96	$159.44	$95.69	**$129.46**	$135.97
Per Party Day Spending, Total Trip Spending (Both Within and Outside 30 Miles of the Port)						
Hotels, motels, cabins, B&B		3.24		11.88		14.42
Campground fees		11.8		8.9		3.61
Restaurants	28.08	13.29	31.2	18.07	24.61	21.4
Groceries	28.08	11.12	29.94	15.67	24.83	16.98
Gas and oil for auto, boat, RV	33.31	8.39	35.6	19.03	29.48	23.27
Other auto expenses	0.77	2.79	5.7	2.41	10.72	3.22
Other boat expenses	44.46	5.76	42.07	11.66	33.17	18.75
Recreation and entertainment fees	7.69	3.82	1.5	2.86	1.35	3.8
Sporting goods	56.92	5.14	27.99	7.98	14.95	9.33
Other expenses	7	5.3	4.54	4.81	6.59	7.31
Total spending	$206.31	$70.65	$178.54	$103.27	$145.70	$122.09

Source: Economic Impacts of Recreation Activities at Oregon Coastal and River Ports, August 2003, U.S. Army Corps of Engineers

Table 9 – Travel Impacts for Clackamas, Marion, Multnomah, Polk, Washington, and Yamhill Counties

Summary	2000	2001	2002
Visitor Spending by Commodity Purchased ($Million)			
Accommodations	405.9	382.7	390.3
Food & Beverage Services	490.2	493.0	531.8
Food Stores	110.3	112.9	119.3
Ground Tran. & Motor Fuel	629.5	623.0	591.8
Recreation, Entertainment	285.1	285.5	300.2
Shopping	378.2	381.5	406.5
Spending at Destination	2,299.1	2,279.0	2,339.7
Travel-Generated Earnings by Industry Segment ($Million)			
Accommodation & Food Services	333.5	327.9	338.2
Arts, Entertainment & Recreation	85.7	86.3	88.4
Retail (incl. Motor Fuel)	73.8	74.0	73.3
Air Transportation	175.0	164.0	147.0
Travel Arrangement Services	79.9	75.9	68.1
Auto Rental & other ground transp.	43.6	43.3	40.3
Total Direct Earnings	791.3	770.3	756.2
Travel-Generated Employment by Industry Segment (Jobs)			
Accommodations & Food Service	8,859.8	8,689.8	8,469.9
Arts, Entertainment & Recreation	3,540.8	3,460.9	3,430.9
Retail (incl. Motor Fuel)	1,971.5	1,981.5	1,911.6
Air Transportation	4.3	4.1	3.8
Travel Arrangement Services	981.6	871.5	741.3
Auto Rental & other ground transportation	571.4	621.5	561.4
Total Direct Employment	15,929.5	15,629.3	15,088.9
Income % of Sales			
Accommodation & Food Services	33%	33%	32%
Arts, Entertainment & Recreation	30%	30%	29%
Retail (incl. Motor Fuel)	20%	19%	18%
Total Direct Earnings	27%	27%	27%
Average Wage/Salary per Job			
Accommodation & Food Services	37,642	37,734	39,930
Arts, Entertainment & Recreation	24,204	24,936	25,766
Retail (incl. Motor Fuel)	37,433	37,345	38,345
Total Direct Earnings	49,675	49,286	50,116
Average used			34,680

Source: Dean Runyan Associates, Direct Travel Impacts by County in Oregon

Table 10 - Economic Effects of Visitor Trip Spending in Oregon (2002)

	Sales ($MM)	Income ($MM)	Value Added ($MM)	Jobs
Direct Effects				
Lodging	$9.35	$3.57	$5.55	196.1
Eating and drinking	$13.39	$5.12	$7.24	355.5
Amusement and recreation	$3.44	$1.45	$2.12	122.5
Retail	$9.67	$4.71	$7.68	204.4
Wholesale	$4.99	$2.09	$3.45	40.7
Other services	$2.95	$1.07	$1.57	40.3
Groceries	$1.87	$0.31	$0.60	8.5
Sporting goods	$0.44	$0.10	$0.17	3.6
Other manufacturing	$8.83	$2.70	$3.19	78.7
Government	$0.07	$0.02	$0.03	0.3
Total	$55.00	$21.14	$31.61	1,050.60
Total Effects				
Lodging	$9.82	$3.75	$5.83	206.1
Eating and drinking	$14.51	$5.55	$7.85	385.2
Amusement and recreation	$4.35	$1.80	$2.55	139.8
Retail	$12.18	$5.95	$9.70	260.6
Wholesale	$8.33	$3.49	$5.76	68
Other services	$23.86	$8.95	$14.64	286.5
Groceries	$3.20	$0.50	$0.94	14
Sporting goods	$0.46	$0.10	$0.18	3.7
Other manufacturing	$13.29	$4.23	$5.16	120.4
Government	$1.14	$0.40	$0.49	10.1
Total	$91.16	$34.72	$53.11	1,494.40
Multipliers				
Lodging	1.0503	1.0504	1.0505	1.0510
Eating and drinking	1.0836	1.0840	1.0843	1.0835
Amusement and recreation	1.2645	1.2414	1.2028	1.1412
Retail	1.2596	1.2633	1.2630	1.2750
Wholesale	1.6693	1.6699	1.6696	1.6708
Other services	8.0881	8.3645	9.3248	7.1092
Groceries	1.7112	1.6129	1.5667	1.6471
Sporting goods	1.0455	1.0000	1.0588	1.0278
Other manufacturing	1.5051	1.5667	1.6176	1.5299
Government	16.2857	20.0000	16.3333	33.6667
Total	1.6575	1.6424	1.6802	1.4224

Source: Economic Impacts of Recreation Activities at Oregon Coastal and River Ports, August 2003, U.S. Army Corps of Engineers

Table 11 – RIMS Multipliers for Oregon State

Industry Description	Final Demand Output	Final Demand Earnings	Final Demand Employment	Direct Effect Earnings	Direct Effect Employment
Construction	2.2567	0.6816	24.6622	2.0793	2.4758
Food and kindred products and tobacco products	2.0725	0.3981	18.7071	3.3170	3.9454
Textile mill products	1.6515	0.3805	14.5573	1.8842	2.0275
Apparel and other textile products	1.7834	0.4505	23.0517	1.9272	1.6364
Paper and allied products	2.0899	0.4097	13.1627	2.9437	4.6904
Printing and publishing	2.0936	0.5680	21.2178	1.9805	2.0995
Chemicals and allied products and petroleum and coal products	1.7632	0.3787	12.1465	2.2334	3.1341
Rubber and miscellaneous plastic products and leather and leather products	1.8678	0.4376	16.3922	2.0934	2.2179
Lumber and wood products and furniture and fixtures	2.4890	0.5509	22.1426	2.9134	4.0969
Stone, clay, and glass products	2.0638	0.5366	19.8162	2.1998	2.3966
Primary metal industries	1.9600	0.4675	14.3092	2.2093	3.1414
Fabricated metal products	2.0275	0.5381	18.9640	2.0521	2.2743
Industrial machinery and equipment	2.0649	0.5400	16.7617	2.1719	2.8328
Electronic and other electric equipment	1.9607	0.5310	15.2744	2.0184	3.1067
Motor vehicles and equipment	1.8580	0.3300	11.3312	3.2994	4.8515
Other transportation equipment	1.9324	0.5057	16.2586	1.9638	2.4859
Instruments and related products	1.9244	0.5437	15.6512	1.8842	2.7284
Miscellaneous manufacturing industries	2.0920	0.5384	25.0246	2.2173	1.8740
Transportation	2.0334	0.5948	21.6898	1.9810	2.2634
Communications	1.8471	0.4483	15.4959	2.1578	2.9694
Electric, gas, and sanitary services	1.6610	0.3123	8.9834	2.4047	4.6683
Wholesale trade	1.8453	0.5578	18.5242	1.7311	2.1746
Retail trade	1.9245	0.6047	31.0859	1.6762	1.5096
Depository and Nondepository institutions and security and commodity broker	1.8865	0.5275	19.0084	1.9154	2.2350
Insurance	2.3811	0.7589	27.1548	2.1616	2.5027
Real estate	1.3913	0.1455	7.0725	3.3798	2.5036
Hotels and other lodging places, amusement and recreation services, and mot	2.0407	0.6286	37.5904	1.8004	1.4919
Personal services	2.0822	0.6913	41.8164	1.7658	1.4644
Business services	2.0048	0.7346	30.7321	1.6423	1.6764
Eating and drinking places	2.1678	0.6002	39.0851	1.9451	1.4883
Health services	2.0825	0.8042	27.8317	1.5907	1.8605
Miscellaneous services	2.1326	0.6423	32.5877	1.8968	1.6469
Households	1.2542	0.3496	15.7316	-	-
Retail trade	1.9245	0.6047	31.0859	1.6762	1.5096
Eating and drinking places	2.1678	0.6002	39.0851	1.9451	1.4883
Transportation	2.0334	0.5948	21.6898	1.9810	2.2634
Average	2.0419	0.5999	30.6202	1.8674	1.7537

Source: US Bureau of Commerce, RIMS Multipliers for Oregon State, averages on bottom row used in analysis

Table 12 – List of Contacts

Company/Agency	Name
Albany Visitors Association	Jimmie Lucht
American Heritage River Initiative, Willamette River Navigator	Mark Brown
Blue Heron Paper Company	Eric Jensen
City of Salem Parks Project Section Manager	TJ Newman, ASLA
Clackamas County (Canby Ferry)	Richard Koskela
Clackamas Heritage Partners	David Porter
Columbia River Yacht Club	Bill Quinton
Congresswoman Hooley's Staff	Suzanne Kunse
Convention and Visitors Association of Lane County	Kari Westlund
Corvallis Tourism	John Hope-Johnstone
Earth Crusaders	Jerry Herrman
Eugene Parks and Open Space	Andrea Riner
Fishing guide	Bob Rees
Hut Shuttle	George Hutmacher
Joe Bernert Towing	Tom Bernert
Low Bridge Charters	Peter Weills
Marion County (Buena Vista and Wheatland ferries)	Ed Watson
Oregon City	Mayor Alice Norris
Oregon State Marine Board	Wayne Shuyler
Oregon Tourism Commission	Marlene Lindlet
Oregon Tourism Commission	Todd Davidson
Oregon's Mount Hood Territory	Linda Bell
Pacific Northwest Waterways	Glenn Vanselow
PGE	Sunni Radcliffe
Portland Oregon Visitors Association	Carol Lentz
Portland Yacht Club	Fred Carter
Salem Convention and Visitors Association	Bill Dorney
Sportcraft Marine	Eric Dye
State Historical Preservation office	Stephen Poyser
The Sternwheeler Rose	Captain Paul Simonis
Travel Oregon	Karen Viehoever
US Army Corps of Engineers	Jim Mahar
West Linn Paper Company	Ian Dunlap, John Otten
Willamette Falls Cultural Heritage Foundation	Sandy Carter
Willamette Jetboat Excursions	Andy Moos
Willamette Queen	Captain Richard Chesbrough
Willamette River Restoration Initiative	Rick Bastasch
Willamette Riverkeeper	Travis Williams

Note: List includes parties interviewed in this study and members of the steering committee

Historic Statement of Oregon City

The following is a brief history of Oregon City. The intent is to provide a general overview, rather than a comprehensive history

Setting

Oregon City, the county seat of Clackamas County, is located southeast of Portland on the east side of the Willamette River, just below the falls. Its unique topography includes three terraces, which rise above the river, creating an elevation range from about 50 feet above sea level at the riverbank to more than 250 feet above sea level on the upper terrace. The lowest terrace, on which the earliest development occurred, is only two blocks or three streets wide, but stretches northward from the falls for several blocks.

Originally, industry was located primarily at the south end of Main Street nearest the falls, which provided power. Commercial, governmental and social/fraternal entities developed along Main Street north of the industrial area. Religious and educational structures also appeared along Main Street, but tended to be grouped north of the commercial core. Residential structures filled in along Main Street, as well as along the side and cross streets. As the city grew, the commercial, governmental and social/fraternal structures expanded northward first, and with time eastward and westward to the side and cross streets. Before the turn of the century, residential neighborhoods and schools were developing on the bluff. Some commercial development also occurred on this middle terrace, but the business center of the city continued to be situated on the lower terrace. Between the 1930s and 1950s, many of the downtown churches relocated to the bluff as well. The industrial area remained at the south end of the downtown area throughout the 20th century. As the city continued to grow, development eventually expanded to the upper terrace and spread eastward.

The small community of Canemah, located just south of Oregon City (and now included within its city limits) developed just above the falls on the river. Canemah is a National Register historic district.

Native Americans, Early Exploration, Fur Trade and Missions: to 1846

Much of Oregon City's importance lies in its early history as the first permanent Euro-American settlement in the Willamette Valley and the first incorporated city west of the Rocky Mountains. Founded in 1829 and incorporated in 1844, it first became the home to fur traders and missionaries. As "the end of the Oregon Trail," it soon became the final destination for many early immigrants.

Prior to Euro-American settlement, the area where Oregon City is located was a focal point for fishing and trade among the Native Americans and home to the Clowwewalla (also known as the Charcowah) and the Cashhooks Indians (of the Upper Chinookan Linguistic group) and the Mollala Indians (of the Waiilatpuan Linguistic family). The nearby Clackamas Indians, also of the Upper Chinookan Linguistic group, located their villages along the Clackamas River. Smallpox, cholera and other Euro-American diseases introduced by early explorers decimated the tribes. By the time Euro-American settlement in the area began, only about 650 Clowwewalla and Cashhooks remained. Their numbers steadily declined into the mid-19th century. After the remnants of the tribes were relocated to the Grand Ronde reservation, they became extinct.

In the 1810s, fur traders explored the Willamette Valley and surrounding areas. Donald McKenzie, a partner in the Pacific Fur Company located at Fort Astoria, is believed to be the first white man to visit the area of the Willamette Falls when he ascended the river in 1812. The company and the fort were sold to the North West Company, a British enterprise in 1813. By 1814, both the North West Company and the Hudson's Bay Company regularly trapped the lower Columbia and Willamette Rivers. In 1821 the two fur companies merged under the Hudson's Bay name and four years later built Fort Vancouver.

In 1823, Dr. John McLoughlin was appointed Chief Factor of the Hudson's Bay Company at Fort Vancouver. In 1829, McLoughlin laid out a two-square mile claim at the Willamette Falls and began construction of three houses to shelter employees working at the site. The houses were burned by the natives, but rebuilt by McLoughlin. A small fur trading center was also established and work was begun on a millrace. These buildings became the first permanent white settlement in the Willamette Valley. By 1839, the settlement had grown to a collection of small houses clustered around the millrace populated primarily by employees of the Hudson's Bay Company. The settlement, which would become Oregon City, was originally known as Willamette Falls.

In 1833, Reverend Jason Lee and his nephew, Reverend Daniel Lee, were approved by the Mission Society of the Methodist Episcopal Church to establish a mission in the west. When the Lees arrived at Fort Vancouver, McLoughlin encouraged them to start their work south of the Columbia River in the Willamette Valley. The Willamette Mission was established in 1834 in present-day Marion County.

During the winter of 1839-1840, Reverend Jason Lee gave a series of lectures in Peoria, Illinois in an effort to recruit reinforcements for the Methodist Mission and to encourage American settlement in the Oregon Territory. Following these lectures, the first overland American immigrant party was organized. Led by Thomas J. Farnham, the Peoria Party arrived at the Willamette Falls settlement in late 1839 and early 1840. Others arrived via ship, including George Abernethy and Alvin F. Waller, both part of the "Great Reinforcement" for the Methodist Mission, in June 1840. Reverend Waller was dispatched to establish a church and store at Willamette Falls later that year. Abernethy was appointed manager of the store. McLoughlin donated land and materials for the church and a parsonage. In 1841, Waller established the Island Milling Company and by 1842 was operating a small sawmill and was making plans for a flour mill on a portion of McLoughlin's claim in what appears to have been an effort to secure an American claim to the land near the falls. McLoughlin, in a further effort to stake his claim, platted and named the growing village "Oregon City" in 1842.

The Methodist Church, the first Protestant church west of the Rocky Mountains, was completed in 1843, the same year that Provisional Government, under the jurisdiction of the United States, was established. Oregon City was incorporated in 1844, the first incorporated city west of the Rocky Mountains, as the number of immigrants was growing and Oregon City boasted 75 buildings. In 1845, Oregon City became the seat of the Provisional Government and George Abernethy was appointed governor. Oregon City continued to grow and by 1846, had a population of more than 500 and a growing number of businesses. The first Masonic Lodge in Oregon, Multnomah Lodge No. 1, was granted a charter that year.

Settlement, Statehood and Steampower: 1847 to 1865

Oregon Territory was officially created in 1848 and Oregon City was designated as the Territory's first capital, an honor it held until the capital was moved to Salem in 1852. Oregon was granted statehood in 1859.

The city continued to grow rapidly with the increase in overland migration. Industry continued to develop as a number of mills were established to support the need for lumber and flour. Although the discovery of gold in California in 1847 initially reduced the territory's population as a number of settlers left for the gold fields, it also opened the market for supplying provisions to miners, stimulating industry and commerce. A number of miners returned to the area after the gold rush passed. By 1849, the population of Oregon City was over 900.

A new industry developed in 1850 when the first steamboat on the Willamette River, the "Lot Whitcomb," was built. An increase in agricultural production in the mid-Willamette Valley required improved methods of shipping goods and river transport became common between the upper valley and Oregon City. Because the falls initially required the movement of freight from one ship to another, shipbuilding enterprises developed at both Canemah (above the falls) and Oregon City (below the falls). Shipbuilding was more prolific at Canemah, but at least eight steamboats were built in Oregon City in the 1850s and 1860s.

Oregon City's position as the hub of the Territory declined in the 1850s as the capital was moved to Salem and Portland surpassed it as a population and shipping center. Its position as the center for trade, politics and urban activity in the county, however, was secure.

In the 1860s, Oregon City's growth continued, but at a slower, steady pace. The economy shifted from a service and shipping-based economy to one firmly rooted in manufacturing. The Imperial Flour Mills were built in 1863-1864 and the Oregon Manufacturing Company (Oregon Woolen Mills) was established in 1864.

Railroads and Industrial Growth: 1866 to 1883

Industrial growth and diversification mark the first years of this period. The first paper mill in Oregon was established in Oregon City in 1866 as the Pioneer Paper Manufacturing Company (also known as the Oregon City Paper Mill and the Oregon City Paper Manufacturing Company) began operations. Although financial difficulties resulted in closure of the mill the following year, it introduced an industry that perhaps has had the greatest impact on Oregon City over the years.

The Oregon and California Railroad Company began laying tracks in Portland in 1868, and heading south on the east side of the Willamette River, crossed the Clackamas River and arrived in Oregon City in 1869. The line was completed as far as Roseburg before being stalled by financial difficulties. As the first rail transport in the state, it opened the Willamette Valley to shipping ports to the north. High rail freight costs, however, resulted in the construction of the Willamette Locks to improve river transport by the Willamette Falls Company in 1873. Not only did the opening of the locks serve to drop the freight rates, but it further stimulated shipbuilding as crops could then be shipped directly to Astoria for transfer to European ships. The railroad, which helped extend the life of steamboat transportation for awhile, was eventually its undoing as rail lines – and freight rates – became more accessible throughout the valley.

Oregon City continued to grow throughout this time period. By 1880, the population was nearing 1400. Commercial businesses developed to accommodate the growing number of

residents, as did educational, religious and social organizations. Most of the development continued in the area of the original townsite on the first terrace, although the congestion was moving people to look at development on the bluff above the city center.

The Progressive Era: 1884-1913

The Progressive Era saw continued growth. A new Clackamas County Courthouse was constructed in Oregon City in 1884. The original courthouse had burned in 1849 and government business had been conducted in rented offices and halls during the intervening years. In 1888, the West Linn and Oregon City suspension bridge was constructed across the Willamette River.

The timber and wood products industries developed into major contenders and the end of this time period were the largest employers in Oregon City and the county. Although the H.L. Pittock and Company Paper Mill, located just north of Oregon City at Park Place, relocated to Camus, Washington in 1885, other mills soon opened in Oregon City. The Willamette Falls Pulp and Paper Company was organized in 1889 and the Crown Mill in 1890. The Hawley Paper Company was established in 1908.

In 1889, the Willamette Falls Electric Company made history when it transmitted the first electricity over long distance power lines to Portland. The growing use of electricity made possible the construction of the first interurban electric railroad in the county, the East Side Railway, which made its first run between Portland and Oregon City in 1893. The establishment of the railway made the concept of commuting a reality for the first time and paved the way for further growth by persons wishing to live in Oregon City and work in Portland.

A number of new subdivisions and additions were platted between 1888 and the mid-1910s and growth began in earnest on the bluff. Residential neighborhoods shifted from the city center to the second terrace before the turn of the century, as did the location of the schools. A small number of commercial enterprises located on the upper level, but the commercial core remained in the downtown business center. The bluff was accessed by wooden stairs and unimproved roads.

Several civic improvements took place during the Progressive Era. The city water system and fire department was expanded and improved. Electric lights and sidewalks were installed and street improvements began. The Carnegie Library was completed in 1913. Interestingly, the city's first major effort at historic preservation occurred in 1909, when Dr. McLoughlin's house was relocated from downtown to the bluff where it has been restored and designated as a landmark.

The Motor Age: 1914 to 1940

The arrival of the automobile brought significantly changed life in America. The first automobile arrived in Oregon City in 1903 when C.G. Miller established his automobile dealership. His business became known as the Miller-Parker auto dealership in 1913 and the C.G. Miller Company in 1922. Several other dealerships followed and a number of auto-related businesses, including garages and service stations, were established. The State Highway Commission was created in 1913 and legislation in 1917 created the State Highway Fund. Soon after, construction on a modern highway system began. Highway 99E, referred to in 1923 as the "Super Highway," was constructed through downtown Oregon City. In addition to construction

of the highway, street paving improved. A new bridge across the Willamette River replaced the Oregon City-West Linn suspension bridge in 1922.

Transport of another sort developed in 1913, when the first municipal elevator in Oregon City was constructed. The water-powered elevator made the trip between the downtown and bluff easier for residents and supported a continuing trend to locate the residential neighborhoods on the upper terraces, while the downtown remained the focal point for commercial and governmental business. After the construction of a new fire station on the bluff, a new city hall office building was built downtown in c.1925. Commercial development was strong following World War I and a number of new store and office buildings in the downtown were constructed and existing buildings remodeled. Growth continued through the Great Depression, but at a slightly slower rate.

Although the Great Depression was not as devastating in Oregon as it was in other parts of the country, its affects were felt locally. Oregon City was the recipient of a variety of funds from federal programs, many of which results in new improvements in the downtown area. A new Clackamas County Courthouse was constructed in 1936-1937 with assistance from the Public Works Administration. The highway underpass was also constructed in 1936-1937 with PWA funding. The Singer Creek Falls and Steps were constructed in 1936 with funding from the Works Projects Administration (WPA). Other federally funded projects in Oregon City included a new high school, a new grade school, a new swimming pool, and street and highway improvements.

With improved roads and new trucking technology, the timber and wood products industry experienced great expansion. The Willamette and Crown mills merged in 1914 to become The Crown Willamette Pulp and Paper Company. The Great Depression, however, brought a slowing to the industry and several smaller mills closed. In 1937, Anthony Zellerbach took control of several mills, including Crown Willamette, which became Crown Zellerbach.

World War II and the Post-War Era: 1941 to 1950

World War II brought an end to the Great Depression and ushered in a fully modern period. Although growth and development was slowed during the war, the period following the war was one of substantial expansion in Oregon City, as it was in most communities around the country.

The timber and wood industry recovered from the Great Depression slump and was restored to its position as the state's leading industry with the building boom that followed the war. New residential neighborhoods expanded eastward to the third terrace above the river as newfound prosperity allowed many to buy their own homes. Schools followed and churches that had been located downtown for years migrated to the bluff as well.

Commercial growth in the downtown area continued, although only a handful of new buildings were constructed. Much of the development involved the creation of new "modern" businesses, which opened their doors in existing buildings.

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