

Chapter 3 Portland's Changing Riverscape

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When the first white settlers arrived in what is now Portland over 150 years ago, the Willamette River was virtually a pristine river. Indians used it for transportation and fishing but their impact was minimal. The white settlers, however, immediately platted a town, built docks and started using the river. Therein began a series of changes and modifications which continue to this day. Within a few years wharves and industry lined the banks and there were several ferry crossings. Increasing numbers of ships used the harbor. Eventually bridges were built and replaced, a seawall was added, the channel was deepened and transferred from the east to the west side of the river, and an island was enlarged to accommodate Portland's first airport. On the east bank a freeway replaced river-related industrial and transport uses. The Willamette, which became heavily polluted before the 1960's, has been rehabilitated and now supports water related recreation. Today's riverscape has relics of the past side by side with new housing, stores, offices, and recreational development.

The factors responsible for the changes that have taken place on the river are complex and include: flood control, sewage abatement, improvement of navigation, transferral of port facilities downstream, highway construction, air pollution control, loss of industry, increase in downtown building, and changes in lifestyles and attitudes

of the population. A description of the Willamette River will help in understanding factors that brought about these changes.

WILLAMETTE RIVER

The Willamette River originates in the Cascades and Coast Range and flows 100 miles northward over a meandering course to Oregon City where it drops 50 feet over Willamette Falls, then flows at a low gradient to its confluence with the Columbia River 15 miles distant. The Willamette has an annual runoff of 26,000,000 acre feet, most of which occurs during the winter. Tributary dams built after 1938 as part of the Willamette Basin Plan store runoff during the winter and release water during the dry summers. This has tended to reduce the natural fluctuation in seasonal flow, as well as improve water quality and reduce flooding. Prior to World War II, low areas near the river in the Portland area were subject to flooding in the winter.

The river level in Portland is also influenced by the level of the Columbia. The Columbia River's maximum runoff is in May and June. This high water ponded the Willamette and caused flooding in low lying areas. Dams in British Columbia, Washington and Montana have reduced this problem and there has been no significant spring flooding on the Columbia or the Willamette since 1948. Before the building of the dams the major historic flood on

the Columbia River (1894) inundated a large part of downtown Portland.

Portland's changing riverscape can perhaps best be seen by comparing specific areas along the river and analyzing the factors responsible for the changes. The areas to be discussed are: The Downtown Waterfront, the East Central Waterfront, Johns Landing, McCormick Pier, RiverPlace, and Swan Island (Figure 3.1). Bridges, an especially important component of the riverscape, are discussed separately.

Downtown Waterfront

The Downtown Waterfront has undergone more change than any other section of the river (Figure 3.1, A). Some changes have occurred because of river-related uses such as shipping, flooding and waste disposal; since 1970 changes have occurred because the downtown was declining. Efforts to revitalize downtown have included projects to beautify the waterfront and have resulted in the development of a waterfront park.

The Downtown Waterfront was Portland's initial shipping area. In its heyday there was a continuous line of wharves along the river. The opening of the Panama Canal in 1914 stimulated intercoastal trade which increased harbor congestion and resulted in the movement of facilities downstream, away from downtown. By 1915 few ships used the downtown waterfront (Figure 3.2).

As the city grew, outdoor privies were no longer adequate and sewer lines were placed under the stream courses flowing from the West Hills. They terminated at outfalls built at the low water line and discharged under the wharves. The growth of population between 1890-1920 increased the volume of sewage and the waterfront

became an undesirable area, especially during low water in the summer. Sewage also accumulated during spring and winter when high river levels caused the water to rise above the sewer outfalls and discharge backed up into downtown buildings.

Frequent floods near the river were a nuisance and caused businesses to seek higher ground to the west (Figure 3.2). The city decided that a solution to the flooding and sewage backup had to be found. A seawall would keep out flood water but the city charter did not permit a local improvement district for this purpose. Sewer construction, however, was allowed so the seawall became part of the sewer plan. A seawall was built from S. W. Jefferson to N. W. Glisan streets (Figure 3.1). An interceptor sewer built behind the seawall carried all effluent to a pumping station at the foot of S. W. Ankeny Street (Strong and MacNaughton, 1929). At low water the raw sewage flowed by gravity directly into the river. During high water it had to be pumped.

The seawall along the west bank of the river was constructed of solid concrete 18 feet wide at the base and 32 feet high. This was above all known floods except that of 1894. The wall has never been topped, although the Christmas flood of 1964 came very close. The seawall project succeeded in keeping water out of downtown and kept sewage out of basements. Part of the sewer project plan also called for a 24 foot-wide esplanade along the seawall to provide river access for pedestrians, but it was not built (Staniford, C. W., et al, 1924). In 1931 the city decided to construct a public market near the seawall between the Morrison and Hawthorne Bridges. Completed in 1933, it never enjoyed the popularity of the Farmer's Market it replaced, which was strung



Figure 3.1: View of Portland towards the north. (A) Downtown Waterfront, (B) East Central Waterfront, (C) Johns Landing, (D) McCormack Pier, (E) RiverPlace, (F) Swan Island. Bridges are (a) Morrison, (b) Steel, (d) Burnside, (e) Broadway, (f) Ross Island, (g) Marquam, (h) Fremont. The distance between the Marquam Bridge (g) and Fremont Bridge (h) is approx-

imately 2 1/4 miles. The Columbia River is at the top of the photo (Photo: Photo Art).

along S. W. Yamhill Street. Both shoppers and vendors preferred the informal atmosphere of the street market. Increasingly the area came to be used for parking space by the growing number of automobile commuters attracted to downtown.



Figure 3.2: Portland waterfront in 1915. View toward the west. Note absence of ships along the waterfront. To avoid harbor congestion, vessels were berthing downstream. In upper center of photo is the central business district which had moved away from the river to avoid flooding. Its elevation of 50-60 feet was 20-30 feet higher than along the river. The Powers Building 1878 (P) also on Figures 3.3 and 3.4, can be used as a reference point for change along the river (Photo: Oregon Historical Society, Negative #G16921).

By 1929 the feculence of the river was so great that people were repelled rather than attracted to the area. Water related recreation became severely curtailed. The water pollution, at times, was so great that even the hardiest forms of life could not survive (*Oregonian*, 1936). A major study conducted from 1926-33 concluded that: the water had a negative oxygen balance,

there was a high bacterial count, and that sludge was accumulating on the river's bed (Gleeson, 1936). A primary sewage treatment plant was proposed for the Columbia Slough south of the Columbia River; however, funds were not available during the Depression. Finally in 1952, 19 years after the 1933 report, the plant was built. New interceptor sewers were constructed on both sides of the river. On the west the pumping station terminated at the foot of Ankeny Street. Sewage was pumped under the river to a trunk line which carried the sewage to the plant on Columbia Slough. River pollution continued, however, with discharge from pulp and paper mills, canneries, and upstream municipal sewage.

Finally, in the middle 1960's a massive cleanup of the Willamette was initiated. Mandated by law and aided by various grants and tax incentives, the program proceeded with great popular support. Municipalities upgraded sewage facilities from primary to secondary. Pulp and paper mills and canneries were forced

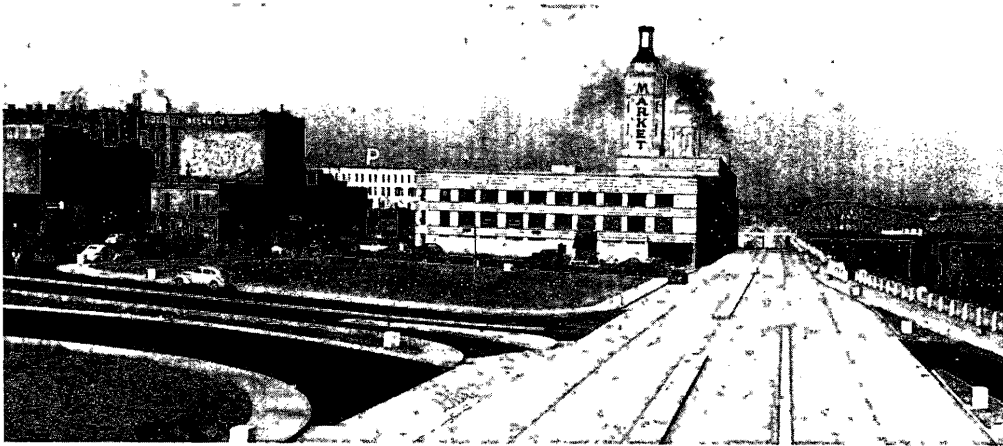


Figure 3.3: Harbor Drive in 1944. View is to the north. Front Avenue is small road to the left side of photo. The seawall is on the right. Some of the oldest buildings were razed to make room for the project. The Public Market shown here, completed in 1933, remained. The bridge is the Morrison which opened in 1905 (see Table 3.1) (Photo: Oregon Historical Society, Negative #COP00548).

to pre-treat waste before discharge. The overall effect was a river in Portland which could once again be used for recreation (*Oregonian*, 1978).

The waterfront area, though not important for shipping in the 1930's, had considerable use. Automobile traffic was heavy on the streets and vacant space was used for parking. Front Avenue served as the major north-south traffic way through downtown. Increasing auto traffic caused congestion. After years of discussion, voters in 1940 approved the Front Avenue Project which called for the widening of Front Avenue and the creation of a major arterial next to the seawall called Harbor Drive (Figure

3.3). The project necessitated the razing of a large number of Portland's oldest buildings.

Construction of the highway was interrupted in 1942 and not completed until after World War II. Harbor Drive (Highway 99W) had no traffic signals and the ramps from the bridges were raised so that north-south traffic was unimpeded. The widened Front Avenue was signalled and served downtown traffic. The effects on public use of the river were considerable. Because Harbor Drive had no traffic signals, it was dangerous for pedestrians to cross to the seawall. When navy ships visited during the Rose Festival, temporary wood bridges were built over Harbor Drive. People in vehicles could not see the river from Harbor Drive because of the height of the seawall. Portland's downtown waterfront became more isolated during this period (1942-1971) than it had ever been. The seawall was frequented by derelicts and occasional fishermen who were willing to face the river's pollution and high speed traffic on Harbor Drive.

Following World War II the downtown core deteriorated due to rapid suburbanization. Retailing followed

people to the suburbs. Many downtown buildings, especially from Front Avenue to Fourth Avenue became dilapidated. In an attempt to save downtown, several things were done. First, the Portland Planning Commission was delegated to develop a downtown plan that would provide the framework for development. Second, the Portland Development Commission was given the tools to consolidate parcels of land which could be used for development. The most important of these was urban renewal. Others were tax increment financing and property tax abatements on land used for manufacturing and for middle income housing.

During the 1960's the Interstate Highway system came to downtown Portland. The inner distributor loop of the freeway was designed to carry through traffic around the core (Figure 3.1). Completed in 1968, the west part of the loop called the Stadium Freeway (I-405), was constructed below grade and is bridged by major east-west streets. It crosses the Willamette River over the Fremont Bridge. Its main impact on the waterfront was to divert traffic from Harbor Drive to the west side of downtown. In 1971 the city decided to vacate Harbor Drive and replace it with a park. Opposition to the proposal came from those who felt the area could be more effectively used to park automobiles. Twenty years earlier the area might, in fact, have been used for that purpose. However, air pollution had increased in excess of EPA standards, and as part of a solution to the problem, a limit of 39,000 automobiles was set as the maximum number that could be parked downtown without using space along the waterfront.

The first phase of the Downtown Plan was completed in 1972 and included a park along the river. The report re-

commended that the area between the waterfront and core be designated for urban renewal, which made tax increment financing available for public improvements throughout the area. The City Charter also had to be amended by vote of the people to eliminate the tax increment debt limit which expanded the financing mechanism without additional burden to the taxpayer (Wolff, et al., 1975).

In 1974 Harbor Drive was removed and by 1977 Waterfront Park had been built along the river from S. W. Market to S. W. Burnside Streets (Figure 3.4). It was planned to be an integral part of downtown. Front Avenue became a tree-lined boulevard with numerous cross walks and traffic signals. The Park and Front Avenue tree patterns extend toward the downtown along city streets. Large areas were left as open grass "meadows" for the use of events such as the annual Rose Festival in June. An esplanade was constructed at the river's edge. In order to improve visibility of the river the solid balustrade on the seawall eventually will be removed and replaced with an open rail. In the event of flooding, panels can be added for protection. The dock at the foot of Stark Street has been redeveloped for public use and facilities for water access have been built at both ends of the seawall. When completed, the park will have pools, fountains and artificial ponds as alternative forms of water contact (Wolff, et al., 1975).

Waterfront Park was renamed in honor of the late Governor Tom McCall, who led efforts to clean up the river. It has been very successful in attracting users. The Rose Festival, concerts, Neighborfair, a mid-summer revel, etc., attract people from all over the metropolitan area. It is especially popular among downtown office workers as a

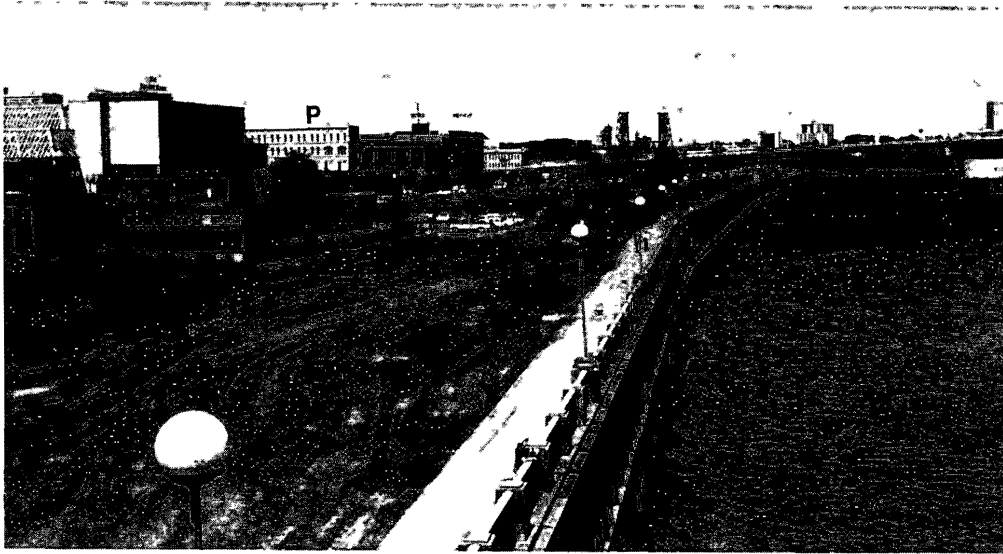


Figure 3.4: Tom McCall Waterfront Park (1978). View along the seawall looking north. The worn appearance of the ground is due to heavy crowd use associated with events such as Neighbbor Fair. Willamette Center is on the left of the photo. Buildings on the left are on the west side of Front Avenue and are among the oldest in the city. The twin towers of the Steel Bridge are in the center. The area along the seawall was covered by Harbor Drive from 1942- 1974. The market once stood to the right of the cars in the center of the photo. The bridge in the foreground is the new Morrison, a drawbridge built in 1958 (Photo: J. Ashbaugh).

place to relax and eat lunch in good weather. Derelicts, long time users of the river front, find the open meadows ideal for sleeping and resting, especially during warm weather.

In the last 15 years, the downtown has moved back toward the river. Willamette Center, an office complex built by Portland General Electric, and the Marriott Hotel are examples of this renewed interest. The construction of buildings between the river and Fourth Avenue marks the reversal of a long time trend started early in this century to build on higher ground west of the river (Figure 3.2). A stimulus to building in downtown was federal tax legislation passed in 1972 which encouraged building investments as tax shelters. Because of over-construction since 1972 office vacancies in downtown have ranged between 15 and 20 percent (Oregonian, 1987).

In the last decade there has also been an important shift in downtown sectorial employment. The greatest gains have been in clerical office workers in the public and private sectors. The effect of these changes on the riverscape has been dramatic. High rise buildings of brick and stone have replaced the low rise wood frame con-

struction of the earlier era. The daytime population density has increased because downtown workers now join shoppers on the streets.

East Central Waterfront

The east or right bank of the Willamette borders a warehouse and wholesale district (Figure 3.1, B). The Southern Pacific Railroad closely parallels the river. As the city developed the river bank was lined with sand and gravel plants, general cargo docks, small boat landings and boat building yards (Figure 3.6). A seawall was not built on the east side since it was deemed unnecessary for the railroad docks, warehouses and industry that dominated the area. In 1932 a study noted that the existing facilities presented an unsightly appearance from across the river (Bartholomew, 1932). A number of outfalls discharged raw sewage into the river. The area was also not easily accessible because bridge approaches were built over the railroad tracks to separate rail and auto traffic.

The east part of the inner distributor loop of Interstate 5 was built along the east bank in 1964. Ingress and egress from the freeway was by flyovers, some of which were built over the river (Figure 3.5). A proposal was made to build a marina along the river but it was considered too expensive. Instead, an esplanade was built between the Burnside and Hawthorne Bridges (Running, 1961). It can be reached by a walkway from the east side of the Morrison Bridge, and at the end of Madison Street just north of the Hawthorne Bridge (Figure 3.5). While providing an excellent location to view the seawall and the west side of the river, heavy freeway traffic produces extremely high noise levels and it is not a particularly pleasant place.

When the east bank freeway was

built there was little interest in its impact on land use on the east bank of the river. Many welcomed the removal of blight (Running, 1961). Since 1977 developments on the downtown waterfront, including Tom McCall Waterfront Park have stimulated renewed interest in East Central Waterfront land use. Some have suggested moving the freeway away from the river to open the area for a trade center or a park. The estimated cost of doing this, over \$300,000,000, probably means that Portland will have to live with decisions made by highway engineers in the 1960's. In the city's plan for Tom McCall Waterfront Park it was suggested that the east bank of the river should be planted with trees to screen and subdue the massive highway structures. This has still not been done.

Johns Landing

Johns Landing was the first large scale conversion of Willamette river frontage from industrial to residential and commercial use (Figure 3.1, C). Because of its location three miles south of downtown, land prices were low enough to permit development without subsidies. The east side of Macadam Avenue, the site of the Johns Landing Development, had been lined with industrial uses since the latter part of the 19th century (CH2M Hill, 1973). These included sawmills, tanneries and furniture factories. Since World War II the waterfront had been not intensively used. The warehousing and manufacturing functions had been declining because companies needed room for expansion and preferred better access to freeways. Also furniture factories found it difficult to compete with mass produced furniture from southern California. Docks were mostly associated with moving logs and lumber.



Figure 3.5: View toward the west. East Central Waterfront at bottom of photo. The river front was once lined with docks and various industrial uses (Figure 3.6). Today it is dominated by Interstate 5. Along the river's edge is a mile long esplanade which can be reached by the circular walkway at the east end of the Morrison Bridge (center of photo). The central business district, which by 1915 had moved away from the downtown waterfront, is seen to the west of the parking lots at the end of the bridge. Except for the U. S. Bank Tower at upper right, most new building is to the south and is dominated by the First Interstate Bank Tower (far left). Extending across the top of the photo is the Stadium Freeway. Along the west side of the river to the

right of the bridge is the mast of the battleship Oregon (Figure 3.6) (Photo: J. Ashbaugh).

Because of declining property tax revenues along Macadam Avenue the city sought ways to change land use. The area was attractive to developers due to easy accessibility to downtown and would be suitable for relatively high priced housing, retailing and offices. The view to the east of the wooded shoreline of Ross Island would be attractive to tenants. Developers were found and the city made the necessary zone changes. The project was financed entirely with private capital and no tax abatements were requested.

Construction started in the 1970's and continues to date (Pintarich, 1971). Easy access to the river was facilitated

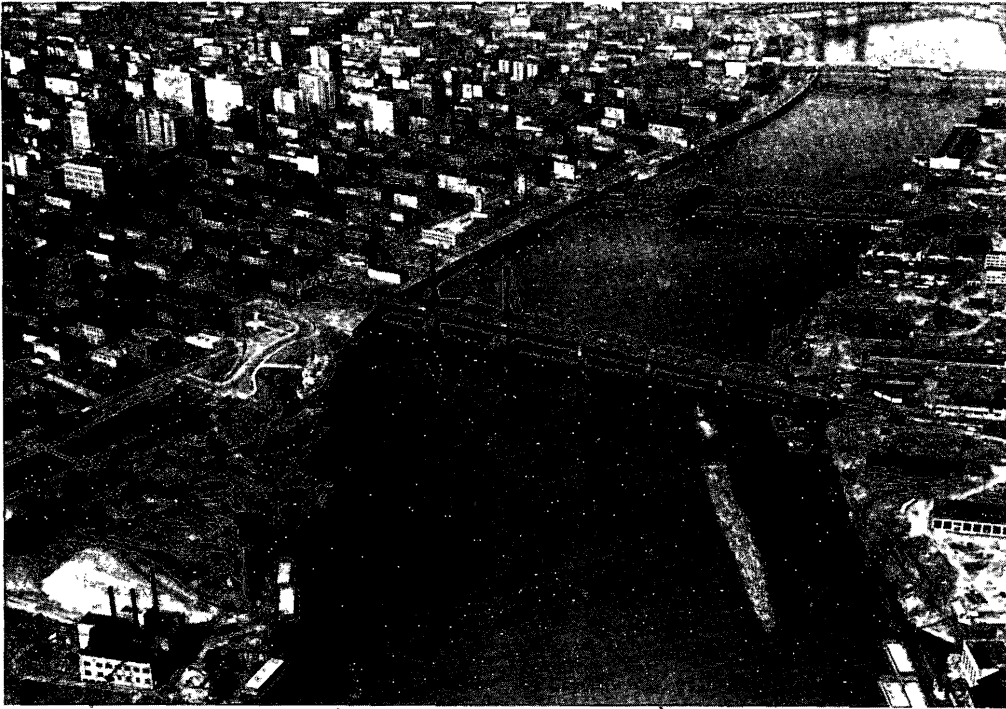


Figure 3.6: View toward west side of the river looking north (1938). Pacific Power and Light Steam Plant is in lower left of photo. Sawdust pile for fuel is north of the plant. The bridges shown from south to north are Hawthorne, Morrison, and Burnside. The twin towers of the Steel Bridge are reflected in the river at the north edge of the photo. The battleship Oregon is anchored on the southwest side of the Hawthorne Bridge. RiverPlace now occupies the area between the battleship and the steam plant. The east central waterfront between the Hawthorne and Burnside Bridges is now dominated by the east bank freeway (I-5). The area at the west end of the Hawthorne Bridge is one of the fastest growing areas in downtown Portland (see

Figure 3.5) (Photo: Oregon Historical Society, Negative #ORH137848).

by sloping the bank and clearing away debris. An important part of the project was 4,500 feet of dedicated public easement along the river. This easement was paved to facilitate pedestrian and bicycle use. A combination of condominiums, offices and retailing has been completed. Macadam Avenue has been widened and provides good access to downtown.

Elements of the past remain, however. The railroad, though not abandoned, is infrequently used and stands as a reminder of the impact of the automobile on fixed rail transit. During the planning phases of the project, Tri Met,

the metropolitan transit system, found restoration of the rail link not to be economically feasible. The Southern Pacific now wants to sell the right-of-way and the city is considering possible future uses. Many residents who live within a few feet of the track fear use for mass transit. Another relic that has been preserved is the Biltwell Furniture Building which was remodelled in 1971 to house small specialty shops, offices and restaurants. The Water Tower which had originally been installed because of high fire risk was retained as a symbol of the development (*Oregon Journal*, 1973).

McCormick Pier

The nadir of residential housing was reached in downtown Portland in the 1960's. Since that time residential units have increased largely due to various federal programs designed to provide low cost housing for the elderly. So, too, has housing for those of upper middle and high income. Those concerned with the general decline of downtown Portland felt that the poor and rich would not provide the economic stimulus necessary to revitalize the downtown. They saw the need for a substantial middle income group to live in the core. However, those on middle income could not afford the high rents required to make private investment profitable. A housing survey also found that some potential renters felt that conventional downtown housing did not suit their lifestyles. In the suburbs they had space to store their sailboats, campers, motorcycles, bicycles and seasonal recreational gear. This group, mostly childless in their twenties and thirties often with two incomes, would be the main market for this housing. Developers believed that the old McCormick Dock would be a suitable

location for housing this group (*Willamette Week*, 1981). Located between the Steel and Broadway Bridges on the west side of the river it was within easy walking distance of downtown businesses (Figure 3.1, D).

Following World War II the Southern Pacific Railroad acquired McCormick Pier for use as a track side warehouse. The dock was razed and a huge amount of crushed rock was dumped to create a stable surface for construction. Increases in truck transportation and traffic congestion caused the railroad to abandon plans to build, however. The area, a little over 11 acres in size was considered by some to be unbuildable. The huge amount of crushed rock had overburdened the underlying river silt. From time to time the silt would liquify under pressure and part of the fill would slide into the river. Soil engineers agreed that an earthquake of a magnitude possible in Portland would completely liquify the silt and the whole fill would slide into the river. The solution to the problem was the removal of part of the crushed rock. With permission of the U.S. Army Corps of Engineers the extra crushed rock was put in the river next to the fill. In this way a large part of the load was removed and the rock that had been moved helped stabilize the river bank.

The Department of Housing and Urban Development provided a construction loan guarantee in exchange for an agreement that rents would be geared to those on middle income (*Oregon Journal*, October 9, 1980). Finally, to make it profitable the developers received tax abatements from the city (*Oregon Journal*, April 10, 1980). Three hundred and five apartments were constructed along with a small marina. A public walkway serves as an esplanade along the river. Storage problems of

tenants were solved by the acquisition of a nearby warehouse. Tenants have easy access to the light rail system, MAX, which crosses the Steel Bridge.

Critics of the development pointed out that noise of rail traffic across the Steel Bridge would aggravate tenants. To overcome this apartments on the south were provided with window shutters and extra insulation to reduce the sound. Another potential problem was dust from the loading of grain at the Globe elevator directly across the river. The initial response to apartments at this location was not overwhelming. However, they are now completely occupied and there is a waiting list of potential tenants.

RiverPlace

RiverPlace is the most ambitious undertaking thus far in the development of the downtown waterfront (Figure 3.1, E). It includes the construction of condominiums, a public marina, luxury hotel and retail shops.

For years the west side of the river to the south of the Hawthorne Bridge was dominated by a sawdust-fired electric generation facility owned by Pacific Power and Light (Figure 3.6). Steam from the plant provided heat for downtown buildings. Until 1957, when the plant converted to natural gas, a large area was needed for the storage of sawdust. Sharing the site next to the Hawthorne Bridge was a small park and former moorage of the decommissioned Battleship Oregon. At the beginning of World War II the outdated battleship was scrapped at Kelso, Washington to provide metal for the war effort (Carter, 1983, p. 82).

Inexpensive hydroelectricity and changes in building heat technology had rendered the utility plant obsolete and alternative uses of the 73 acre site

were explored. None appeared to be economically feasible. The completion of the Tom McCall Waterfront Park to the immediate north in 1977, however, stimulated interest in development. In 1978 the Portland City Council amended the Downtown Waterfront Urban Renewal Plan to include this South Waterfront area. The Portland Development Commission invited proposals for development of 10 acres of the area. The winner of the competition was Cornerstone Development Company, a division of Weyerhaeuser. They named their development RiverPlace.

Their plan called for the construction of 500 residences, a small luxury hotel, restaurants, retail shops, a small boat marine and a river front park and esplanade. Everything except the residences have been completed (see Figure 4.5). The construction schedule depends on market absorption. About 160 residences were completed as of August 1986 (*Portland Magazine*, 1986). The project appears to be successful and represents the culmination of Portland's return to the river. Rowing, sailing, water skiing and other water related recreational activities are increasing.

Swan Island

At the time of settlement, Swan Island was a small tree covered island lying in the center of the Willamette River (Figure 3.1, F). The main channel on the east separated the island from Mock's Bottom. The swift current and the sharp curves on the downstream end of the island created a hazard to Portland bound vessels. The west channel was wider and straighter but very shallow. During high water the island was submerged.

In 1921 Swan Island was purchased

by the Port of Portland. Between 1923 and 1926 they dredged a new channel to the west of the island. The new channel was 1,500 feet wide with a minimum depth of 35 feet at low water (*Oregonian*, 1926). The old east channel was closed by the construction of a causeway from the southern tip of the island to the east bank of the river. Dredge spoil was used to quadruple the island's size to about 250 acres and to raise the overall elevation to 32 feet, reducing the danger of floods.

In 1926 the Port of Portland decided to use the island for an airport. The first plane landed on July 14, 1927. In December Charles Lindberg landed in the "Spirit of St. Louis" to dedicate the field (Polhemus, 1928).

In 1935 the Bureau of Air Commerce notified the port that it would not approve operation of larger aircraft at Swan Island. The small size of the landing field and the bluffs to the east were considered hazardous for larger aircraft. The site of the present Portland Airport was selected in 1935 and Swan Island was largely vacated.

During World War II the entire island was leased to the U.S. Maritime Commission for construction of a major shipyard built and operated by the Henry J. Kaiser Company. Following the war, the island was returned to the Port of Portland. The wartime improvements included docks, buildings and cranes. The Port added a dry dock and ship repair facilities on the northern end of the island.

One of the last areas filled with dredge spoil is between N. Going and N. Channel streets and the river. The Port thought this area was perfect for a diversified development project called the "Window on the Willamette" since access to the river was not blocked by railroads and highways as it was

elsewhere. They named the development Port Center Village and signed an agreement with Ports O' Call in California to operate a mall made up of offices, restaurants and specialty shops (Schulz, 1971). From the outset the shops and restaurants were in financial trouble. The labor force on Swan Island, largely made up of workers on hourly wages was not attracted to the gift shops, boutiques and stores selling imported pipes and tobacco. One restaurant survives; the shops are all gone, having been replaced by offices (Lord and LeBlanc, 1977).

The Bridges

Portland has often been called the city of bridges. Today, a century after construction of the first span across the Willamette, 10 vehicular bridges cross the river within the metropolitan area (Figure 3.1).

The city's land use in large part explains the importance of the bridges (*West Shore*, 1887). The downtown area west of the river occupies a small level area hemmed in by the west hills. Because of high construction costs in the hills and large areas of unstable soils, the area has never supported a large residential population (an exception is an area of northwest Portland between the hills and the warehouse district which has the highest residential population density in the city). On the other hand, east of the river there is expansive gently rolling land and residential construction was easy and inexpensive. People lived on the east side and worked on the west side. As the population grew the number of bridges increased (Table 3.1).

In the 27 years starting in 1887 and ending in 1914, nine bridges were built in Portland. The first was the Morrison, 1887, (*West Shore*, 1887) (replaced 1905).

Table 3.1: *Portland Bridges. Bridges: Year built, type and year rebuilt. Those shown in Figure 3.1 are designated by lower case letters (Oregon Historical Society).*

Bridge	Year Built	Type	Year Rebuilt	Type	Year Rebuilt	Type
Morrison (a)	1887		1905	Drawbridge		Drawbridge
Steel (b)	1888	Drawbridge	1914	Drawbridge		
Hawthorne (c)	1891		1900		1910	Drawbridge
Burnside (d)	1894	Drawbridge	1926	Drawbridge		
Broadway (e)	1913	Drawbridge				
Sellwood	1925	High Bridge				
Ross Island (f)	1926	High Bridge				
St. Johns	1931	Suspension				
Marquam (g)	1966	High Bridge				
Fremont (h)	1973	High Bridge.				

It was followed by the Steel Bridge in 1888 (replaced 1914). In 1891 the Hawthorne Bridge was completed (replaced in 1900 and 1910). The last two bridges in this period were the Burnside in 1894 and the Broadway in 1913 (Table 3.1). The prodigious movement of people back and forth across the river caused the rapid deterioration of the first bridges, Hawthorne and Morrison, which were constructed of wood. The new bridges were built of steel and three of these built before 1914 still stand. They are the Hawthorne 1910, Broadway 1913, and Steel 1914 (Table 3.1).

No bridges were constructed after 1914 until the Sellwood Bridge was finished in 1925. In 1926 the Ross Island Bridge opened and the new Burnside Bridge was completed. By 1930 the city's population had increased to 301,815, almost 100,000 more than twenty years earlier (U. S. Department of Commerce, 1931). Much of this growth had taken place in southeast Portland which was served by the Sellwood and Ross Island Bridges (Laurgaard, 1922). No more bridges were built in the core area until the Morrison in 1958 replaced the 1905 span.

The 32-year hiatus in downtown bridge building from 1926 to 1958 was mainly due to the fact that suburbanization had begun and downtown was not the only destination for traffic (Throop, 1948). In 1930 Portland's population was 301,815 and Multnomah county was 338,241. By 1960, two years after the new Morrison Bridge was opened, Portland had increased in population to 372,289 but Multnomah County had grown to 522,813 (U. S. Department of Commerce, 1960).

The population was more dispersed and the downtown area had stagnated.

There had been no new construction in years. However, people still complained about the bridge congestion. When the bridges opened for passage of ships, cars were backed up for blocks. Bridge ramps were built and rebuilt in the 1960's to speed up traffic. The construction of the interstate highway system made the truck a favored mode of transportation. To facilitate traffic around the congested core areas inner and outer distribution loops were planned for the interstate system. The inner distribution loop in Portland required two new bridges. The Marquam, the first of these, was opened in 1966. It is a multilane double deck bridge whose eastward bound top deck provides a unequalled view of the river, the seawall, Governor Tom McCall Waterfront Park and downtown Portland. It was almost universally reviled as being extremely ugly (Gohs, 1963). Critics insisted that the second bridge, the Fremont, have a more pleasing appearance. The Fremont's design has been widely acclaimed but when completed in 1973 its cost of 82 million dollars was five times more than that of the Marquam (Federman, 1968). Like the Marquam, its multi-lane double deck design, with the top westward bound deck, also provides a good view of the river. Both bridges carry large volumes of vehicular traffic at speeds which prevent the driver from spending much time reflecting on the view. The bridges are high above the river and have no effect on river navigation.

The bridge approaches on both sides of the river are elevated to avoid bottlenecks from cross traffic by either highway or railroad. On the west side they were raised to clear Harbor Drive. On the east the purpose was to achieve grade separation with the Southern Pacific Railroad. While achieving this

purpose, they also tend to isolate areas near the river. This is no longer true on the west side where Tom McCall Waterfront Park has been made accessible to pedestrians from the core area. In contrast the narrow noisy east bank park borders on warehouses and parking spaces under the freeway.

CONCLUSION

For most of Portland's history, its riverscape has been dominated by transportation and industrial uses. Other uses, such as recreation and housing were inhibited by water pollution and high land prices. Railroads and highways closely paralleling the river made public access difficult or impossible. By the time river cleanup began (1952) and freeways liberated industry and transportation from close proximity to the river front (1966-1973) suburbanization had drawn people away from downtown. People with mobility provided by automobiles and highways, found an abundance of water related residential and recreation sites outside of Portland. They had little interest in the Willamette River downtown.

Recent developments along the river, however, have provided an alternative to residence in the suburbs. McCormick Pier and RiverPlace are examples. Increases in downtown employment during the last two decades have created a demand for housing from those who want to live close to their work. Finally there have been changes in individual lifestyles. Some prefer to live close to the shopping and recreational amenities offered by downtown.

There is evidence to suggest that the success of one project tends to encourage other development. McCormick Pier was a pioneer effort to provide middle income housing downtown. It was followed by RiverPlace. Recently Portland

General Electric donated land on the east side of the river south of the Marquam Bridge to the Oregon Museum of Science and Industry for new facilities (Figure 3.1). When built, the museum will attract large numbers of visitors who will become acquainted with the river area and perhaps consider it as a place to live. Of course, increased popularity usually means higher land values. If what appears to be a renaissance along the river is to continue to appeal to those on middle incomes, future developments will require subsidies. In any event, a fresh new look is replacing the remnants of a bygone era along the river. Portland's riverscape is becoming a vital and attractive focal point within the city.

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