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Portland's Changing Landscape

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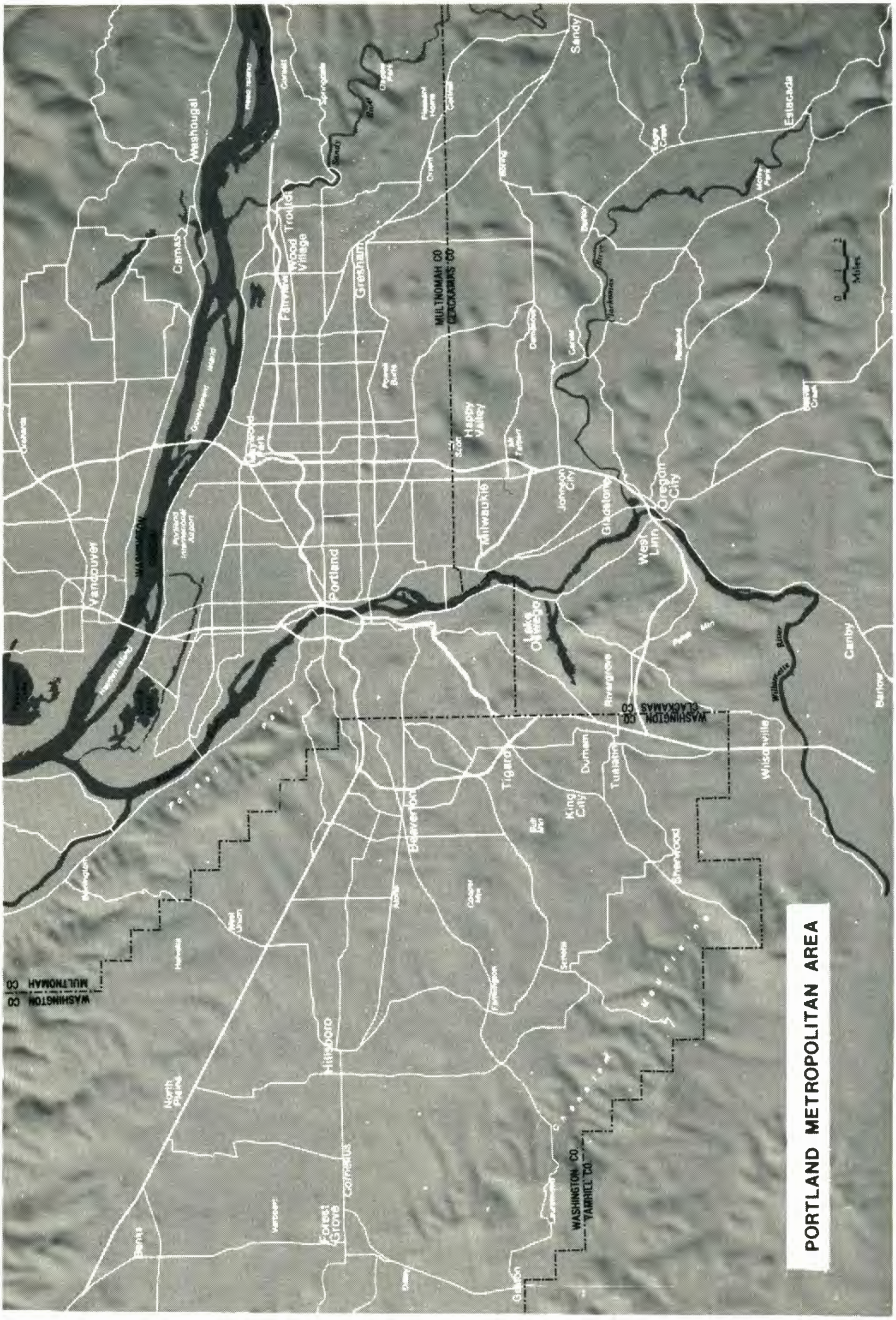
PORTLAND METROPOLITAN AREA
Miles
Washougal
Camas
Vancouver
Troutdale
Wood Village
Fairview
Gresham
Portland
Milwaukie
Happy Valley
Johnson City
Gladstone
Oregon City
West Linn
Lake Oswego
Tigard
Beaverton
Durham
Tualatin
King City
Sherwood
Wilsonville
Canby
Barlow
Sandy
Estacada
Hillsboro
Forest Grove
Cornelius
North Plains
Gaston
MULTNOMAH CO
CLACKAMAS CO
WASHINGTON CO
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MULTNOMAH CO
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Portland's Changing Landscape

Edited by Larry W. Price

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Dedication

To Dale E. Courtney, Professor Emeritus, Geography Department, Portland State University, and Coral Courtney, without whose generous support this volume may not have been published.

Contents

Preface

The idea for this book began with Thomas Poulsen, head of the geography department at Portland State University. It was autumn 1985 and the department was beginning to gear up for the national meeting of the Association of American Geographers which was scheduled to meet in Portland during April 1987. There were numerous responsibilities to be assigned and details to be attended to. But it seemed appropriate to do something more to celebrate the occasion than simply arranging meeting rooms and scheduling slide projectors. It also seemed appropriate to prepare something that would be of significance locally and have a continued use and impact. It was at this point that the preparation of a book was suggested wherein each member of the department would contribute a chapter related to his or her specialties. So it began. An outline of appropriate topics was prepared and I naively agreed to serve as editor. Most authors were drawn from Portland State but in four key subject areas specialists from the community or other universities were invited. In this respect, I would especially like to thank Professor Steven Kale from Oregon State University, who stepped into a vacated spot at the last minute and provided a critical chapter on Portland's economy.

Shortly after the decision had been made to proceed with the volume, Robert Aangeenbrug, executive director of the Association of American Geographers, visited the campus. He declared that the organization was considering having monographs prepared for future meetings with a focus on the meeting city rather than the traditional volume containing guides to the field trips. It was to be called the "Spotlight Series." What a serendipity! We had already begun. Accordingly, the Association was quick to provide its blessings and early seed money for the project. All of the more than 2,000 registered participants coming to the meeting in Portland will receive a copy. The department gratefully acknowledges the good relationship it has enjoyed with Aangeenbrug and his staff.

In a multiple authored volume such as this there are a great many people to whom we are indebted and some who should be acknowledged may be forgotten in the shuffle. A major debt is owed by professors Lycan and Latz to the Center for Population Research at Portland State University for providing data and support for their studies. Professors Duecker, Rabiega, and Edner express their thanks to students Ross Roberts and Judy Davis for their contributions to the analysis of Portland's urban transportation system. The Oregon Historical Society provided documents or illustrations for several of the papers. The Portland Marriott Hotel willingly allowed us the use of an illustration for the book cover. Professor Hamilton who has been a visiting lecturer at Portland State, but whose permanent institution is the London School of Economics and Political Science, would like to express his thanks to that institution for support. Students in the department contributed to the book in various ways; chief among them are Terry Daniels, George Hanby, Karl Lillquist and Steve Welter. Among the staff, I would like to single out Professor Richard Lycan for his ready help and sage council. Dick prepared or supervised the preparation of

several key illustrations including the frontis map. John Tomlinson, a former student, also drafted several of the illustrations. Gladys Poulsen and Ellen Bartsch Jones graciously volunteered for the timely task of final editorial reading of the manuscripts.

Chief among the department members requiring thanks is Carolyn Perry, secretary, comptroller, and purveyor of all goings on. She willingly, single-handedly, and very ably shouldered much of the responsibility for organizing, scheduling, and typing the entire manuscript as well as the problems of dealing with a temperamental computer and editor. She also assumed the onerous task of contacting authors in subtle and not so subtle ways that it was time, nay far past time, for their chapters to be delivered. The fact that the book was completed on schedule is due to her encompassing efforts.

Portland State University
March, 1987

L. W. Price

Introduction

Larry W. Price
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Portland, Oregon is one of five major cities along the west coast of the United States. Most Americans have heard of it and know approximately where it is located. Yet if you were to ask them to tell you something about the city they would probably find it difficult to do. Portland is generally considered the least major of the west coast cities. There is nothing distinctive that symbolizes it as the Space Needle does for Seattle or the Golden Gate Bridge does for San Francisco. It is not nestled along a beautiful deep water bay with ships anchored offshore and ferries moving from place to place. Instead there is a river spanned by bridges with tugboats comprising a large part of the water traffic. Still, when this scene is combined with the nearby hills, it makes for an extremely attractive setting, especially with the distant high Cascade volcanoes as background. It is also within this river setting that the Port of Portland exports more wheat than any other port in the country. In fact, when measured on the basis of total tonnage, Portland is the largest export port in the United States.

The population of Portland (1,341,000 for the SMSA) is about a million less than Seattle and several times less than San Francisco, Los Angeles, and San Diego. During the decade of the 1970's, however, Portland gained population faster than any of them except for San Diego. Still, congestion and crowding are not a problem. The cost of housing is less than in Seattle and considerably less than in the larger California cities. Portland is a big place but retains many of the attributes of a smaller place. This quality was nicely capsulized in an article published in the October 21, 1985, New Yorker: Portland..."combines the intimacy of a town with the density and the richness of a city." It is this character, in fact, the juxtaposition of big and small, the built and the natural, that is the essence of the place.

The economy of Portland is not dominated by a single industry as in Seattle; consequently it projects a less distinctive image focused around wood products and diversified manufacturing and commerce. And yet the intellectual and industrial climate of Portland has combined to produce the recent blossoming of the "Silicon Forest," which has become a recognized force in the world of computers, instruments, and related software. Portland is becoming known as an important center of innovation and high technology.

On a cultural basis Portland cannot compete with San Francisco; we did not host Tutankhamen. We have no world class marina or aquarium. However, there is a good symphony, zoo, museums, and a new performing arts theater. Portland has a high reputation for jazz and is the home of several nationally known jazz musicians, e.g., Tom Grant, Mel Brown, and David Friesen. We do not have a professional football team, but the Trail Blazers have put Portland on the basketball map. The number of world class authors

who live in Portland and Oregon is impressive; those more recently in the limelight include Ken Kesey, Jean Auel, and Ursula LeGuin. Portland is an outstanding book town with more used bookstores per capita than most cities, including one of the single largest used-new bookstores anywhere.

Oregon has received substantial publicity in recent years because of its innovative approaches to land use, and its concern with the environment and the quality of life. The "Oregon Bottle Bill" is perhaps one of the best known expressions of the seriousness of this concern. In the 1960's a major committment was made to clean up the Willamette River. The success of that effort is reflected in a virtual rennaissance of interest in the river with a number of recent housing and recreational developments being focused there. During the late 1960's Portland also condemned and removed a formerly heavily traveled downtown highway next to the river and transformed it into a park. This is now the site of the annual Rose Festival. To improve air quality, a limit was set on the number of automobiles that could be in the downtown. Portland has been more successful than most places in integrating activities and reducing the duplication and overlap of services and functions that occur between the central city and suburbs. Similarly, Portland has designed innovative ways of using taxation and public monies to carefully restructure and build the downtown.

National competitions have been held to attract the most creative designs for buildings and structures. Among the more notable that have changed the face of the downtown in recent years are: the Pioneer Courthouse Square completed in 1984, already a symbolic center for the city; and the post-modern massif of the Portland Building designed by Michael Graves. The addition of the huge (38 ft. tall) and beautiful hammered copper sculpture of "Portlandia" by Raymond Kaskey to the west entrance of this building makes it a "must see" for visitors.

Like most cities, Portland lost population to suburbs in the years following World War II, but recently it has been successful in attracting people back to the central city. This includes creating more "people places," e.g., the mall, the square, and the fountains; creating attractive middle income housing especially along the river; and promoting an interesting old town, Saturday Market, and other urban renewal projects. In the late 1970's a major decision was made by then Mayor Neil Goldschmidt to cancel a planned freeway development to the southeast side and divert the allocated federal funds to mass transit. This eventually resulted in a new light rail system which runs from downtown to Gresham (MAX). Although controversial, this development has been far more successful at the outset than even the most optimistic could have hoped.

The concern for quality of environment was perhaps voiced best by former Governor Tom McCall, in his famous comment "come visit but don't stay." What he meant was, "we like it the way it is." Portland has embraced newcomers, however. This can be seen in the number of immigrants who have settled here. While Portland does not support the large ethnic communities of New York or Chicago, smaller enclaves exist. There is a "China Town" (although few Chinese live there), and a distinct black community. Still, homogeneity is far more characteristic than ethnic discontinuity. Portland has fewer blacks, hispanics, and orientals than the other west coast cities. The 1980 Census indi-

cates that 93.3 percent of Portland's population is white; compared to Seattle's 89.4 percent, and Los Angeles' 73.5 percent. Although less in actual numbers than either Blacks (33,385) or Hispanics (24,341), the nonwhite minority with the largest impact on the Portland landscape is East Asian (23,971). A strong oriental influence can be seen in local architecture, landscaping, and in the abundance of specialty resturants and grocery stores. Portland supports one of the better public Japanese Gardens in the country.

Portland recently gained notoriety by being voted "the most liveable city." The ramifications of this claim are pursued in the last chapter which explains how Portland combines the amenities of a big city with the atmosphere of a town. We can have our cake and eat it too. This is countered by the discomforting fact that Portland has one of the highest reported crime rates in the country. Most Portlanders do not sense this, however; residents typically think nothing of walking down city streets after dark.

Another of the amenities and characteristics of Portland is the closeness and quality of nature. One of the impressions that newcomers often mention is the greenness of things. This, of course, is a function of the climate and dominance of evergreen vegetation, but it is also because of ample open space and parks. There are many places in Portland where one can be surrounded by woods yet within throwing distance of houses and stores. Macleay and Forest Parks in the West Hills comprise 4,682 acres of more or less wild and natural woods, making it the largest natural urban park in the United States.

The surrounding countryside adds to the closeness of nature. Mount Hood looms skyward 60 miles to the east and beckons like a backyard playground. It is one of the few places in the country where one can ski throughout the summer. The coast, with its pounding surf and spectacular headlands, is equidistant to the west. The Columbia Gorge, with its waterfalls and rapidly changing environments, serves as an exciting change of place. In winter when it is raining in Portland, bright and sunny skies can usually be found within two hours drive to the east of the Cascades.

Oregonians are big on nature. The local Audubon Society is well subscribed; native plant societies thrive. Mushroom hunting is a practiced science. The growing of roses, camellias, and rhododendrons is pursued as cult-like activities. The relative number of people who belong to environmental organizations, e.g., the Sierra Club or Nature Conservancy, is among the highest in the country. Wetlands and other natural habitats in the city are watched with careful eyes. The Great Blue Heron nests in oak trees along the Willamette with equanimity. Portland has become reknowned as a top town for runners. The Mazamas, a local mountain climbing club, is one of the oldest and most respected such organizations in the country. Oregonians love to hunt and fish; the American Rifle Association finds high membership here.

In short, two threads are woven through the tapestry of the following essays. One is that Portland is a big city but with many of the attributes of a small town. The second is the accesibility of city and nature. The problem, of course, is how to nurture and maintain the one without harm to the other. The evidence is clear that most major American cities have not been able to achieve this. Only the future can tell how Portland will fare. The focus of

this book is on dynamics and change in the landscape. Each author has approached the problem from his or her own perspective, but the net result is a taking stock, an accounting of where we have been and where we are going. When viewed as a whole the book should provide a better view than we have had of the nature and character of this special place.

Chapter 1
Portland's Landscape Setting

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Portland is often perceived as being a coastal city but it is actually situated 80 miles from the ocean in the Willamette Valley, a large synclinal depression between the Cascade Mountains and the Coast Range. This valley, 200 miles long by 30-40 miles wide, slopes gently northward and is occupied by the Willamette River, the longest north flowing river in the continental United States. Portland straddles the lower 20 miles of the Willamette until its confluence with the Columbia. The Columbia River, of course, rises several hundred miles to the northeast in the Canadian Rockies, and transects the Cascades and Coast Range on its way to the sea. In Portland, both the Columbia and Willamette Rivers are within 10 feet of mean tide level and feel the daily ebb and flow of the tides. In addition, the presence of ships, loading cranes, and the hustle and bustle of dock areas, give Portland an aura of the sea.

Sixty miles to the east is the crest of the mountains, appearing as a dark green ridge in the distance except for the intermittent snow capped sentinels, e.g., Mt. Hood. The Cascades are a major natural barrier. This is expressed in many ways, but perhaps most strongly through their effects on weather and climate. The abundance of clouds and rain on the west side is well known. This in turn produces the dense conifer forests for which the Pacific Northwest is so justly famous. The Cascades also stand as threshold and gateway to the more continental and sunny east side -- the Columbia plateau, Blue Mountains, and beyond. These two features, then, the mountains and the sea, are part of the environment and ambience of Portland, and yet they are both distant phenomena.

The Portland landscape itself may be capsulized as consisting of a broad valley floor, the confluence of two rivers, a longitudinally elongated ridge of hills, and a spattering of extinct volcanoes (see map frontis). These features are a function of Portland's location in a young orogenic region, with faulting, folding, and volcanism all in evidence. The other major factor contributing to landscape character is Portland's location near the debouchure of the Columbia River from the Cascades. This great transverse passageway provides a sea level conduit between the east and west side of the mountains and is of special significance since the major events that have shaped Portland's landscape history have come primarily from the east. Curiously, these include both what are among the largest lava and water floods on the face of the earth. This essay begins and ends with these spectacular but disparate events.

COLUMBIA RIVER BASALT

The primary rock type of the Portland area is Columbia River basalt. The his-

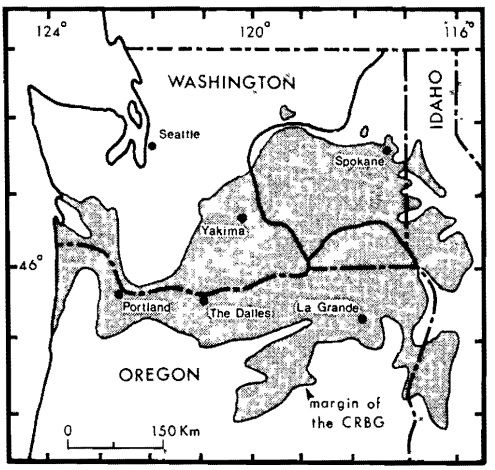

Figure 1.1. Generalized distribution of the Columbia River Basalt, including all of the individual flows (from Tolan, Beeson, and Vogt, 1984, p. 90).

tory of the fissure flows which compose this material is extremely interesting and great strides have been made in recent years in working out their differentiation, timing and movement (Hooper, 1982; Swanson, et al., 1979). They represent a great volcanic pile of flood lavas erupted from north-northwest trending vents to the east of the Cascades some 17.6 million years ago. They cover an area of 80,000 square miles stretching from Idaho to the Pacific Ocean, with their finest development occurring on the Columbia Plateau in northeastern Oregon and southeastern Washington (Figure 1.1). In places the basalt reaches depths of over 10,000 feet (Reidel, et al., 1982), but thicknesses decrease to the west and in Portland they are only about 1,000 feet thick.

Not all of the flows reached western Oregon. The ancient Cascades existed at the time, as did the ancestral Columbia River, and the westward flowing lavas could only cross the Cascades through this gap (Beeson and Moran, 1979). There has been much speculation about the location of ancestral channels of the Columbia River (Hodge, 1938; Lowry and Baldwin, 1952). Recent analysis of the flows through paleomagnetic polarity and chemical composition indicates that while there have been substantial changes in channel location during the last 15 million years, the river has remained within 50 miles of its present location in the Cascades, generally to the south of the present Columbia River Gorge (Fecht, Reidel and Tallman, 1985) (Figure 1.1). Evidence from intercanyon flows beneath the present location of Mt. Hood suggests that the river formerly flowed to the southwest, emptying into the central Oregon coast near Lincoln City (Tolan, Beeson and Vogt, 1982, p. 92). Its channel was forced northward by later flows until it reached its present location. This gives rise to the intriguing idea that many of the headlands on the Oregon Coast are actually intercanyon flows, representing ancient Columbia River channels (Allen, 1984).

The individual flows of the basalt average about 50 feet in thickness. Between flows there were often long intervals in which weathering and erosion occurred. Consequently, many of the flows overlie one another unconformably. In some cases weathering horizons and soils are found. One of the most extensive of these is the "Vantage horizon" named for a town in central Washington where up to 200 species of tree fossils are found; the Ginko being one of the more common. In the Portland area, the Vantage horizon is thin and discontinuous but fossil trees up to six feet in diameter have been discovered in it (Diller, 1896, pp. 508-511). The chief significance of the Vantage horizon in Portland is that it

Figure 1.2. Oblique aerial view to the west-northwest of downtown Portland and the Portland Hills anticline. The sharp break in slope where the Portland Hills fault is thought to exist can be seen along the right margin of the hills. The traverse valley across the Portland Hills in upper left of the photo is the path-followed by U. S. Highway 26. Bridges shown from left to right are: Marquam, Hawthorne, Morrison, Burnside, Steel, and Broadway. The photo was taken in 1969 so the Fremont Bridge to the north of the Broadway Bridge is not yet constructed (copyright photo Delano Photographics, Inc.).

contains limonite (strongly weathered iron oxide clay). These low quality deposits were heavily mined in the Lake Oswego area from 1865 to 1894 (Hotz, 1955, p. 91). Iron Mountain, about two miles west of Lake Oswego, now a site of exclusive housing developments, was a major source of the iron ore.

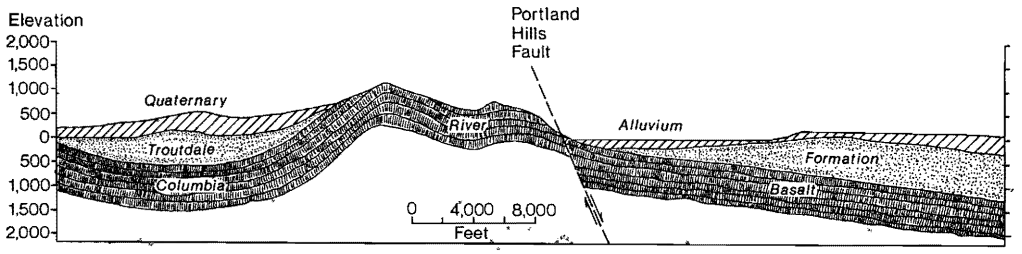

Figure 1.3. Geologic cross section of the Portland Hills showing anticlinal structure as well as the location of the Portland Hills Fault (after Balsillie and Benson, 1971, p. 116).

Remains of the smelter, built of large basaltic blocks, still stand in George Rogers Park by the river in Lake Oswego.

The Columbia River basalt in the Portland area has been strongly folded and faulted as well as dissected by erosion. The most prominent structural feature is the Portland Hills (Tualatin Mountains), an elongated ridge 500-1,000 feet high and 20 miles long by three miles wide, trending northwesterly along the western margin of the central business district (Figure 1.2). The Portland Hills is basically an anticline with synclinal counterparts in east Portland and the Tualatin Valley to the west, buried by as much as 1,500 feet of sediments (Schlicker and Deacon, 1967, p. 17). The east side of the Portland Hills rises abruptly from the valley floor as an impressive escarpment along a straight and sharp boundary which may be a fault (Figure 1.3). The evidence for a fault is not conclusive and the primary geologic maps of the area do not show it (Treasher, 1942; Trimble, 1963). Circumstantial evidence is strong, however, and several workers have argued for its presence (Schlicker and Deacon, 1967; Balsillie and Benson, 1971; Schmela and Palmer, 1972). Seismic activity in the Portland area is relatively low but earthquakes do occasionally occur and it is assumed that the Portland Hills fault is active (Dehlinger, et al, 1963; Schlicker, Deacon, and Twelker, 1964; Heinrichs and Pietrafesa, 1968). Given its presumed location directly under the city center, Portland State University, and the Trojan Nuclear Power Plant at Rainier, its disposition is clearly more than academic.

The Portland Hills is the site for many of the more exclusive and prestigious housing areas of Portland as well as Washington Park with the Zoo, open air water reservoirs, Oregon Museum of Science and Industry, Rose Gardens, and Japanese Gardens. North of Washington Park are Macleay and Forest Parks, a complex of more or less natural areas of forests and trails forming one of the largest urban parks in the United States.

TROUTDALE FORMATION

The Columbia River basalt is locally overlain by up to 1,500 feet of late Pliocene or early Pleistocene sandstone and gravels (Hodge, 1938). This deposit, known as the Troutdale Formation, occurs as a huge fan localized near the debouchure of the Columbia River from the Cascades and consists of two different facies; the upper facies is primarily sandstone of locally derived basaltic materials, presumably eroded from the ancient Cascades. The lower member consists of gravels containing abundant cobbles of quartzite,

schists, and granites which tie it to the ancestral Columbia River and source regions to the east (since the volcanic Cascades do not contain crystalline materials). In addition, the restriction of these deposits to the northern Willamette Valley and Columbia River Gorge, indicates that the ancestral Columbia River was near to its present location in Pliocene time (Tolan and Beeson, 1984). The age of the Troutdale Formation is estimated at between ten to two million years with deposition occurring throughout this period (Tolan, Beeson, and Vogt, 1984, p. 93). The type locality for the deposit is near Troutdale, Oregon along the east side of the Sandy River. Although buried under much of Portland (and providing an excellent aquifer) it outcrops occasionally, especially where it has been upfaulted or folded, as along the east side of the Portland Hills.[1]

BORING LAVAS

If one were to stand on a prominence in the Portland Hills and look eastward over the city, the general impression would be that of a low plain rising gently to the east occasionally interrupted by isolated conical hills. These are ancient volcanoes that erupted locally at the close of the Troutdale deposition from six million to perhaps a few hundred thousand years ago. They consist of both cinder cones and shield volcanoes and are composed of high-alumina basalts similar in composition to the High Cascade volcanoes, e.g., Mt. Hood. In fact, they may have been initiated by the uplift and emplacement of the High Cascades (Tolan, Beeson, and Vogt, 1984, p. 93). Their local distribution is restricted to a 30-40 square mile area in the lower Willamette Valley and foothills of the Cascades.

As many as 90 individual vents and flows have been identified (Figure 1.4). The material of these volcanoes is known as Boring lavas from their occurrence near the town of Boring, Oregon (Treasher, 1942). The lava is characteristically light gray (rather than dark gray or black as is more typical of the Columbia River basalts) and its structure tends to be massive or blocky rather than columnar (Allen, 1975, p. 149).

The Boring lavas were apparently quite viscous because they did not flow far from their vents. Many of the isolated hills formed by these eruptions are well known local landmarks, e.g., Mount Scott, Rocky Butte, Mount Tabor, Kelly Butte, and Mount Sylvania. The best and most accessible example of their volcanic character is Mount Tabor where a small vent has been excavated so the throat and dipping cinder beds are nicely displayed.[2]

Erosion has strongly modified the shape of some of the volcanoes. Rocky Butte, for example, was directly in the path of the Missoula flood waters that

1 *An excellent exposure of Troutdale gravels may be seen near downtown Portland on N. W. Cornell Road just before the first tunnel at about N. W. 34th. Park immediately before the tunnel and walk up the path on the south side of the road which leads to an old gravel quarry site. The material consists of well rounded, coble sized, and strongly weathered gravel clasts of basalt, granite, marble, and quartz.*

2 *Mt. Tabor is located off S. E. Belmont and 69th Street. Turn right at the park entrance and drive about two blocks. The excavation reveals the internal characteristics of the volcanic vent beautifully; it is well worth the trip to see it. A small sign erected by the Geological Society of Oregon Country states that Portland is the only city in the United States with a volcano within its limits.*

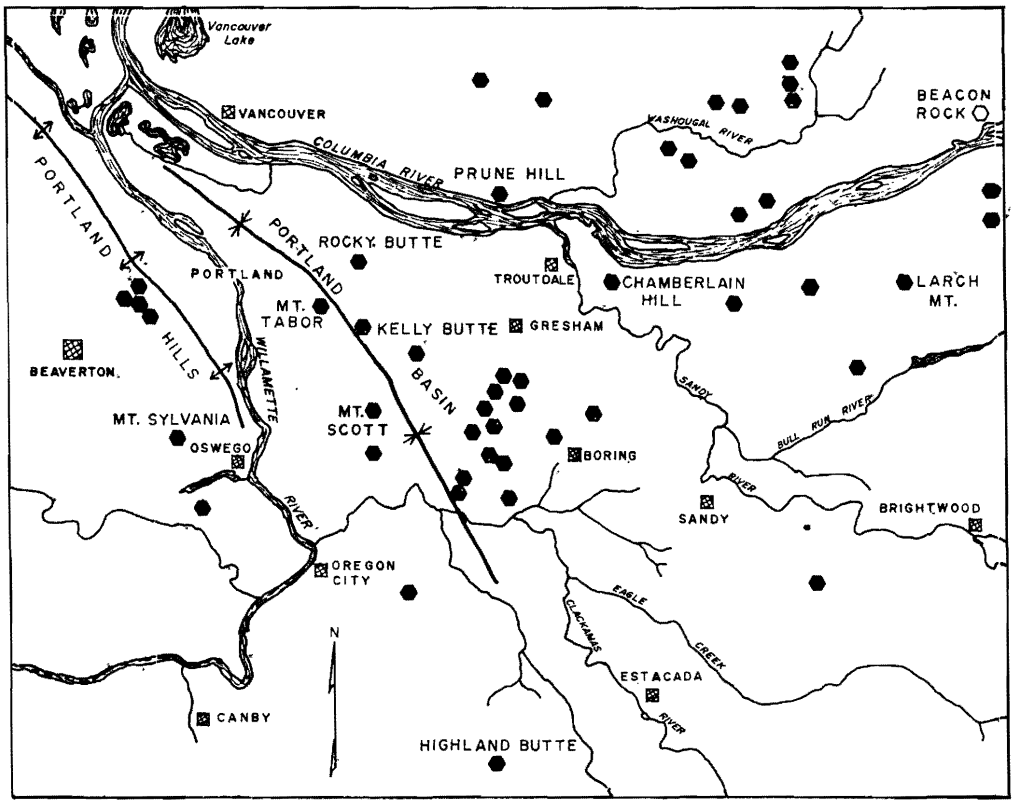

Figure 1.4. Distribution of Boring volcanoes. Three are considered to be shield volcanoes - Larch Mt., Mt. Sylvania, and Highland Butte, while the rest are primarily cinder cones (modified from Allen, 1979, p. 75).

coursed through the Columbia Gorge at the end of the last ice age. Its east facing slope has been cut into a vertical bluff and there is a large depression or pothole to its lee where the waters boiled around the obstacle (Bretz, 1925, p. 255). Rocky Butte also has Troutdale gravels exposed in its sides. Apparently the eruption encapsulated and lifted the gravels since they are exposed at an elevation of about 500 feet above the surrounding surface (Trimble, 1963, p. 41).[3]

Allen (1975) has pointed out that the volcanic vents are approximately aligned with other structural features in the area. For example, the entire west side of the Portland Hills is built of Boring lavas from vents located near the axis of the anticline (Figure 1.4). The lavas flowed predominantly to the west. An interesting feature here is the presence of lava tubes. Several buried caves and tunnels have been discovered and are of engineering concern since

3 *A visit to the top of Rocky Butte is strongly recommended. This is perhaps the best place in Portland to have a 360 degree panorama of the city, Columbia River, Boring volcanoes, and the West Hills with the central business district nestled at their base. Take Fremont Street off N. E. 82nd Avenue to 91st Avenue where you turn north and follow road to the summit.*

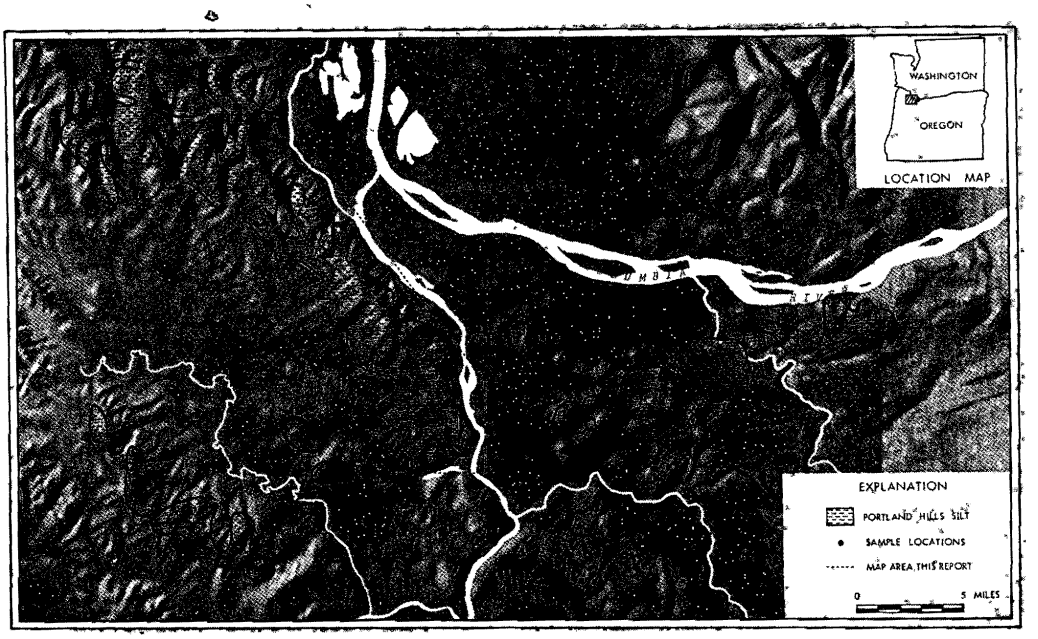

Figure 1.5. Principal areas of Portland Hills Silt. Base map is 1:250,000 raised relief map of Portland-Vancouver area (modified from Lentz, 1981, p. 4).

they underlie important surface structures such as N. W. Barnes Road and St. Vincent Hospital (Allen, 1974).

PORTLAND HILLS SILT

Elevations above 600 feet in the Portland Hills are commonly blanketed with a massive silty deposit reaching depths of up to 100 feet (Figure 1.5). The origin of this material, known as the Portland Hills Silt, is somewhat puzzling because it contains scattered pebbles and stratified bedding, but it is far above know water levels for the region. Earlier workers interpreted it as being water deposited (Diller, 1896; Lowry and Baldwin, 1952), but most recent investigations have argued for an aeolian origin (Theisen, 1958; Theisen and Knox, 1959; Trimble, 1968, Lentz, 1981).

The silt is thickest near the Columbia River and thins with distance away. It occurs on elevated terrain southeast of Portland between Gresham and Boring and in the Mt. Scott area south to the Clackamas County line (see map frontis). Its best development, however, is in the Portland Hills where it is thickest on north and northeast slopes facing the river (Figure 1.5). It thins to less than 50 feet on the west side of the Portland hills, and by the Chehalem Mountains, 18 miles to the southwest, it is only 8 to 10 feet thick. This provides an impressive rate of decrease in depth of five feet per mile. Even more spectacularly, the silt thins from 10 feet in the Chehalem Mountains to zero in only four miles to the southwest in the Red Hills of Dundee (Parsons, 1981). For this reason Parsons (1981) is reluctant to abandon the idea of a water origin for the silt (he would apparently explain its elevated location by tectonic displacement).

Most people, however, consider the

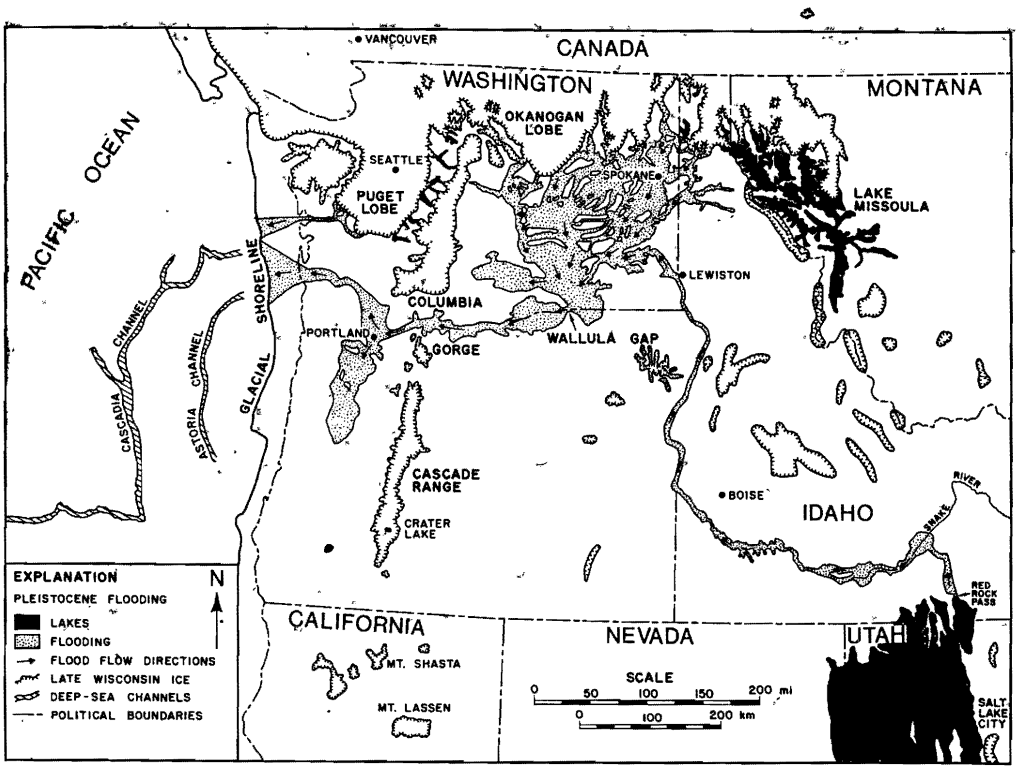

Figure 1.6. Outline of the Missoula Flood. Glacial Lake Missoula in eastern Montana was blocked by lobe of the continental glacier. Eventually, the ice dam was breached and the water surged westward across the Columbia Plateau. Where constrictions existed, e.g., Wallula Gap or The Dalles, the water was backed up as temporary lakes. A large lake also formed in the Willamette Valley. While this is shown as a single event, in actuality it occurred a number of times (from Baker and Bunker, 1985, p. 2).

Portland Hills silt to be wind deposited loess. The material contains large amounts of quartz and mica which could only have come from distant sources to the east of the Cascades. The Columbia River floodplain was the immediate source of the deposit since particle size diminishes and its depth thins with distance from the river. Unlike most loess, the silt is non-calcareous (Theisen, 1958, p. 30).

Lentz (1981) has identified up to four ancient soil horizons in the loess and he correlates them with the glacial periods. This places the silt at from 700,000 to 34,000 years B.P. The wind was easterly for its deposition whereas the modern wind is prevailingly westerly. Recent pollen investigations in the Portland area indicate cooler, drier conditions during the glacial periods (Barnosky, 1984). Such conditions were undoubtedly the result of the greater impact of continentality carried by strong east winds through the Columbia Gorge. The Portland Hills silt is an important factor in local land use and engineering since it becomes very unstable when wet (Schlicker and Deacon,

1967, p. 49). Landslides, mudflows, and slumps are all common on steep areas in the Portland Hills where expensive homes are located. This becomes especially critical in mid-winter after several days of rain have saturated the land. The silt also has low permeability and is not good for installation of septic tanks and drain fields.

MISSOULA FLOODS

Except for the folded and faulted structures and the scattered volcanoes protruding from the valley floor, much of Portland's landscape is composed of unconsolidated sand and gravel. These deposits occur as gently sloping to flat surfaces at multiple levels in the form of terraces. These features can best be seen in east Portland. As one proceeds away from the Columbia or Willamette Rivers, he is faced with a series of marked rises in altitude interspersed with broader treads like giant stair steps. The highest level occurs between 375-400 feet above sea level. Considering a maximum flood stage of 50 or even 100 feet for the river, the origin of these deposits becomes extremely interesting. Clearly, they are not related to the modern river.

The first explanation for the elevated deposits was suggested by Oregon's premier geologist, Thomas Condon, who attributed the gravels to river deposition in a great impoundment caused by formerly higher sea levels in what he called "Willamette Sound" (Condon, 1871). Although this interpretation stood for a number of years, there were problems with it. The sediments contained occasional large boulders, reaching seven feet or more in diameter, including some composed of granite. Such erratics were also known to occur at elevated positions along the Columbia River Gorge and into eastern Oregon and Washington. Based on his marine perspective, Condon explained the erratics as being ice rafted from the Straits of Juan de Fuca and the coast of British Columbia. This required rock-laden icebergs to travel southward along the Pacific coast and then 60 miles up "Willamette Sound" as well as through the Columbia Gorge into eastern Oregon and Washington (Condon, 1902, p. 63).

Later workers, most notably J. Harlan Bretz, thought that the erratics came not from the coast but the interior of Washington and Idaho. Bretz (1919, p. 502) called the impounded sediments "the Portland Delta." Based on his work on the Channeled Scabland of east central Washington, Bretz postulated a huge flood of catastrophic proportions sweeping through the Columbia River Valley (Bretz, 1925). This flood (actually floods) has had more impact on the Columbia Gorge and Willamette Valley than any other event in recent geologic time. In order to understand the local landscape one must be cognizant of these spectacular events (Figure 1.6).

That such floods occurred is now accepted as common place, but in the 1920's it was considered an "outrageous hypothesis" (Baker, 1978). Bretz was confronted in eastern Washington by a vast network of dry canyons or coulees cut deeply into the plateau. These formed a huge, anastomosing, and dendritic drainage system where the loess and basalt had been strongly stripped and scoured creating in Bretz's aphorism, a "channeled scabland" (Bretz, 1923, p. 618). In all, 2,800 square miles of the region had been scoured into the basalt and 900 square miles were buried under depositional materials (Bretz, 1928, p. 446).

Although Bretz was faced on all

sides by strong arguments of how these features could have been created by ordinary events, he was convinced that their origin could only be explained by a relatively brief but enormous flood. Many leading geologists at the time considered his concept a return to catastrophism. Without presenting all of the evidence he marshalled in favor of the flood, suffice it to say that the theory is now almost universally accepted.

The source of the floods was eventually pinpointed in western Montana where the advancing continental ice had blocked the valley of the Clark Fork River to a height of 1,000 feet so its drainage could not escape. A lake 250 miles long and 2,000 feet deep (Glacial Lake Missoula) developed behind the ice dam (Pardee, 1942). The glacial dam eventually failed allowing up to 500 cubic miles of water to surge southwestward across northern Idaho and the Columbia Plateau creating the channeled scabland (Figure 1.6).

The on-rushing water encountered constrictions in its path at Wallula Gap near the Oregon-Washington border, where the Columbia River cuts across the Horse Heaven anticline, and at The Dalles where the Columbia Gorge penetrates the Cascades. In both cases huge temporary lakes were formed. The water level at The Dalles, just 90 miles east of Portland, was 1,100 feet above sea level, whereas in the Portland area the water level was 400 feet. This provides a gradient of 700 feet in 90 miles or 75 feet per mile! One can only imagine the velocity and force of such a torrent.

Once beyond the Gorge the water either entered into a higher sea level or spread laterally and filled the Willamette Valley. If the latter case is true it is somewhat puzzling why it should do so since there is no obvious constriction in the Columbia River valley below Portland as in the other cases mentioned. Bretz thought the ocean was 350 feet above present sea level. This would have allowed for the construction of the Portland Delta which he considered to have been deposited subaqueously, with the river being 100 feet deep above this surface when it was built (Bretz, 1925, p. 212). A more recent proponent of a higher sea level as a cause of impoundment (but not for catastrophic flooding) was Lowry and Baldwin (1952).

The other major interpretation is that the flood waters themselves were sufficient to temporarily inundate the valley. Allison (1935) stressed the importance of icebergs in transporting erractics into the valley and thought that a huge ice jam might have caused the impoundment. Trimble (1963) also argued against a higher sea level, pointing out that late Pleistocene sea level rises of the order required have not been reported from other parts of the world. Also the time of ponding coincided with the glacial maxima when sea levels should have been lower, not higher. This is given support by the discovery of a 300 feet deep channel underlying the present Columbia River in east Portland cut during the late Pleistocene when sea level was lower, and backfilled with sand as sea level rose during the Holocene. A wood sample taken from the sediments at a depth of 200-300 feet yielded a C-14 date of 8,910 + or - 115 years (Hoffstetter, 1984, p. 65).

Trimble's interpretation for the cause of ponding was hydraulic damming "whereby more water entered the valley system than was able to escape through the restriction" (Trimble, 1963, p. 65). The narrowest point in the channel below Portland is between Kalama and

Carrolls, Washington, 35 miles downstream where the channel is 1.8 miles wide at an elevation of 350 feet. The amount of water required for such an opening to serve as a constriction so water would rise to an elevation of 400 feet throughout the Willamette Valley for several days or weeks boggles the mind. The resolution as to which major interpretation is correct continues to elude us, and yet it is essential for working out the details on how the Portland landscape was created. The answer may lie in information still uncovered such as in the various ponded deposits or in the deep sea sediments of the Astoria fan (Bretz, 1969, p. 541; Griggs, et al., 1970).

By whatever mechanism, evidence is clear that there was a huge impondment of water in the Willamette Valley reaching 125 miles to the south slightly beyond the town of Eugene. The maximum height of the water was 400 feet above sea level as testified by a number of large ice-rafted erractics found throughout the valley up to that altitude (Allison, 1935). A classic example can be seen southwest of Portland on the Pacific Highway between McMinnville and Sheridan.

The floor of the Willamette Valley is almost entirely covered by gravel, sand, silt and clay. Maximum depth of the deposits under Portland is 250 feet but at most localities the depth is 100 feet or less. The deposits thin to about 30 feet farther south in the valley (Trimble, 1963, p. 62). One of the most dominant characteristics of the gravels is steeply dipping forset beds, formed as the high velocity water flowed into calmer water. The beds dip mainly to the west and south indicating direction of water movement. Particle size also decreases away from the Columbia Gorge reflecting diminishing energy levels as the sediments were deposited into the ponded water. Trimble (1963, p. 59) considers the material as lacustrine since deltaic deposits are only part of the total picture with much of the alluviation taking place in slack water.

Five distinct terrace levels occur in the Portland area. In north Portland there is a clearly distinguishable level at about 150 feet above sea level. The campus of the University of Portland and Willamette Boulevard occurs on this planar-like surface. Well marked terraces also occur at 200, 250, 290, and 330 feet above sea level in east Portland although the exact elevation varies slightly from place to place. This is because the surfaces had original slope to them, they have been modified by erosion since, and they may have undergone differential uplift from tectonic processes. Nevertheless the terraces are marked features of the landscape and can be seen on virtually any east-west street leading away from the Willamette River. All five levels are beautifully displayed on N. E. Glisan Street which runs halfway between Rocky Butte and Mt. Tabor.

Although the terraces are fundamentally depositional features, there is also considerable evidence of erosion. As the debris-laden flood waters surged from place to place in the valley, and when the impounded water eventually began to drain, both bedrock and depositional surfaces were scoured and eroded. One path of the flood waters the northwest through Vancouver, Washington where a channel 50 feet deep and several miles long was cut in the gravel. Lackamas Lake is located near the eastern edge of this channel.

Another broad erosional swath was cut to the southwest in a line extending from Rocky Butte and Mt. Tabor to Lake Oswego. One may see evidence

of this on the Mt. Tabor 1:24,000 USGS Topographic map where numerous elongated hachured contour lines exist on the elevated terrace surfaces. Sullivan Gulch, a dry channel where the present I-84 freeway and rapid transit system (MAX) is located, was also cut into the gravel. As the water moved to the south it gouged the narrows at Oregon City stripping surfaces to bedrock and creating patches of scabland extending southwestward from West Linn to the Tualatin Valley (Stauffer, 1956, p. 22).

The water poured through the Lake Oswego Gap and scoured out giant potholes and depressions. Much of the material eroded from Lake Oswego was deposited in a fan to the southwest in the Tualatin-Durham-Cipole area. Many gravel pits are located in this region. Evidence that the water came from the west is westward dipping foreset beds, plus the presence of limonite pebbles in the gravels similar to those found at Iron Mountain near Lake Oswego (Lowry and Baldwin, 1952, p. 20).

Immediately to the south near the town of Sherwood is a low drainage divide between the Tualatin Valley and the Willamette Valley. This area, known as the Tonquin scabland, is a miniature replica of what exists in the Columbia Basin of northeast Washington. There is an elongated north-south complex of channels scoured and plucked so that virtually no soil or vegetation exists in many areas. It is thought to have been created when water from the Tualatin Valley spilled southward into the Willamette Valley (Stauffer, 1956; Allison, 1978, p. 194).

The terraces provide a tremendous number of unanswered questions as to their origin and evolution. It is known that the highest terraces are the oldest and the lowest the youngest. This is proved by depth of weathering and soil development on the different surfaces (Trimble, 1963; Parsons, 1982). But they have all presumably been modified by floods subsequent to the one in which they were deposited. In addition there is a distinctly younger deposit of sand and silt disconformably overlying the terrace surfaces. This material ranges from a veneer to over 100 feet in depth and occasionally occurs in channels eroded in the earlier fill (Trimble, 1963; Allison, 1978, p. 196).

There has been considerable speculation as to the age, timing, extent, and number of floods. Bretz initially postulated a single huge flood; later he expanded this to seven or more floods (Bretz, et al., 1956). Glenn (1965) and Waitt (1980) presented evidence for 40 floods. Most recently, a study has been published claiming evidence for 89 floods (Atwater, 1986)! Exactly how each of these relate to one another is extremely difficult to unravel (Baker and Bunker, 1985). Allison (1978) believed that the events were of a two-fold nature. First came a series of smaller floods from the multiple breaching of the glacial dam for Lake Missoula. The water was ponded in the Willamette Valley and flood deposits were laid down. Eventually as the land uplifted and the Columbia River became entrenched, these surfaces were left as terraces. Later came the "big bore," a much larger single flood which was primarily erosional (Allison, 1978, p. 179). It was this flood, Allison argued, that eroded the upper terrace surfaces, cut Sullivan Gulch and the channel now occupied by Lackamas Lake, scoured through the gap at Oregon City and Lake Oswego, and deposited the top coating of younger gravels disconformably on the older cut and fill surfaces.

This theory provides a good working

hypothesis as to the processes involved but the exact mechanisms for the implacement of the terraces and evolution of the various features have not been worked out. We do not even know the exact ages of the various surfaces. The date of the last flood, however, has been well established at about 13,000 years ago (Mullineaux, et. al., 1978). Consequently, Holocene and recent modifications to the surfaces have come about under essentially subaerial conditions. Stream dissection, aeolian processes, mass wasting, and soil development have all left their mark on the modern landscape. Man, too has brought about modifications. Nevertheless, the surfaces retain much of their original character and ample evidence remains for landform students of tomorrow to analyze and interpret. This is particularly true since much of the Portland area is now occupied by residential or commercial activities, with many restrictions through land use policies, to prevent the development of new quarries. It is interesting that in spite of its abundance, sand and gravel in the Portland area is an acutely limited resource. As a matter of fact, most aggregate products are now either crushed or transported in from pits up or down valley (Gray, Allen, and Mack, 1978).

In conclusion, Portland has been the scene of a series of spectacular geologic events. It began with huge lava floods issuing intermittently from eastern Oregon through the Columbia Gorge to inundate the area. Over time these flows were folded, faulted, buried under sediments, penetrated by local volcanoes, weathered, and eroded. Most recently, another series of floods originated to the east of the mountains, this time consisting of vast amounts of water choked with rock debris and ice; these torrents surged through the Portland area, cutting and filling to create the terraced landscape we now see. The overwhelming impression that one is left with after reviewing these events is the great power and scale at which they operated. They can be described only by superlatives. Portland has indeed had a dynamic and exciting geomorphic past.

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Chapter 2
Weather and Climate of Portland

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The climate of Oregon has always been the subject of much discussion, and it is the persistence of precipitation that elicits the most comment, both rational and irrational. A common perception is that the state is suited only to salamanders, waterfowl, and crayfish. In the words of Ken Kesey (1963, p. 5), Oregonians ". . . have lived and worked and logged in the wet so long that they are no longer capable of distinguishing it from the dry." In rebuttal, other Oregonians retort with a certain amount of smugness that the state as a whole receives less annual precipitation than most other states. The average yearly precipitation in the United States is about 29 inches; in Oregon it is only 27 inches, less than states like Pennsylvania (42 inches), Michigan (30 inches), and many others. This, of course, is a statistical abstraction, given the contrast between wet western Oregon and dry eastern Oregon as defined by the crest of the Cascade Mountains. Residents also delight in pointing out that Portland's official value for annual precipitation of 37.4 inches is less than New York City (50 inches), Houston (46 inches), Atlanta (48 inches), and many other American cities not known for extremes in climate. However, regardless of the interpretation of the data, the fact is that compared to most of the nation Portland experiences an extremely large number of rainy days (152 per year), of overcast skies (ranging from 88 percent cloud cover in December to 42 percent in July), and of reduced solar radiation. Rainfall is of low intensity, but it is the succession of overcast, dreary days in the winter that establishes a reputation that is irrefutable.

Richard Maxwell Brown (1980) presented a delightful historical perspective on the subject in an article entitled "Bless the Rain." Early visitors to the Willamette Valley found the long rainy season to be oppressive, and the image of incessant rainfall became a handicap in attempts to attract settlers. To counter this view, promoters placed emphasis on the overall climate and in the 1890's developed what Brown called the "ideology of climate," containing the following propositions:

1. Although rainfall is prolific, it falls gently and does not generally inhibit outdoor work and activity.

2. The total amount of yearly rainfall is about average for the United States and only seems excessive because it is distributed over a longer rainy season than elsewhere.

3. Even when the long fall-to-spring rainy season is taken into account, there are two notable compensating factors: the warm weather in comparison to the subfreezing temperature and blizzards of the central and eastern United States, and the delightfully dry and sunny but not excessively hot summers.

4. The regularity and dependability of temperature and rain is such that -- in stark contrast to other parts of the country -- crops never fail west of the Cascades.

5. The climate is unexcelled for the

personal health of the individual, who benefits in terms of comfort and longevity.

6. When, for comparative purposes, the Northwest climate is viewed in a scope beyond this country, that climate is most analogous to those of England, France and Japan -- "all regions inhabited by healthy and progressive peoples" -- and is therefore not merely the finest climate in the United States but one of the best in the world (Brown, 1980, p. 27).

Given this thoroughly optimistic summary, it is a wonder that our climate must still be defended. To many Portland residents the climate is, indeed, ideal. To others, the lengthy winters are the price one must pay for short, idyllic summers. For most of us the reality lies somewhere in between.

GENERAL CLIMATOLOGY

The climate of Portland -- relatively wet, mild winters and clear, dry summers -- can be classified as a modified west coast marine type; relevant statistics are presented in Table 2.1. A mid-latitude location (45 degrees North) accounts for seasonal contrasts of temperature and precipitation, and the long rainy season is primarily the result of the prevailing westerlies. Precipitation is associated with cyclonic storms embedded in the westerly flow of maritime airstreams and exhibits a well-defined annual cycle (Figure 2.1). The annual march of precipitation is representative of conditions common to the entire west coast of North America (Trewartha, 1981, p. 298): 1) there is a conspicuous single maximum in the annual profile of precipitation which occurs in the winter; 2) a marked single minimum occurs in the summer; and 3) the month of maximum precipitation is a function of latitude, occurring later with decreasing latitude.

All three of these features are closely associated with the seasonal migration of the North Pacific subtropical high pressure cell and of the jet stream and associated cyclonic storms which flank the anticyclone on its northward side (Figure 2.2). The minimum coincides with the summer season when the subtropical anticyclone extends its influence farthest poleward, displacing the jet and the major storm tracks to the north. The single maximum coincides with the retreat southward of the high and the advance toward lower latitudes of the jet stream and storm belts. Approximately 88 percent of the annual precipitation in Portland occurs in the months October through May, 9 percent in June and September, while only 3 percent comes in July and August. Precipitation is mostly rain with an average of only five days per year that receive measurable snow. Seldom do more than 2 - 3 inches of snowfall accumulate, and it generally lasts only a day or so. The greatest official measurement of snowfall in 24 hours was six inches in January, 1950, part of a monthly total of 41.4 inches, also a record. Snow has been recorded in every month of the year in Portland except July.

Although latitude is the dominant control of climate in Portland, topography and distance from the Pacific Ocean also play significant roles. Located 65 miles inland, the city lies in the Willamette Valley midway between the Coast Range and the higher Cascade Range to the east (Figure 2.3). The Coast Range is both a buffer protecting Portland from the full impact of Pacific storms and a modifier of incoming air masses. Marine air is cooled as it moves inland and over the Coast Range, resulting in more than 150 inches of annual precipitation in the mountains west of Portland. Therefore, air that descends into the

Table 2.1: *Climatic summary for Portland, Oregon, 1941-1985. Data are for the National Weather Service station located six miles north-northeast of downtown Portland on the Columbia River. Elevation is 21 feet above sea level. Normals are based on the 1951-1980 record; extremes are for the entire period of record (solar radiation data are from Western SUN, 1980, p. 16; all other data are from NOAA, 1986).*

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual Average
Solar Radiation (BTU/FT2-Day)													
Total Horizontal Insolation	310	554	895	1308	1663	1773	2037	1674	1217	724	388	260	1067
Direct Beam Normal Incidence	952	1302	1583	2159	2603	2494	3111	2825	2413	1746	1143	698	1960
Percent of Possible Sunshine	27	37	47	53	58	55	70	66	61	42	29	22	47
Percent of Mean Cloud Cover	84	83	81	77	72	68	47	52	56	72	82	87	72
Temperature (Degrees F)													
Normals													
Daily Maximum	44.3	50.4	54.5	60.2	66.9	72.7	79.5	78.6	74.2	63.9	52.3	46.4	62.0
Daily Minimum	33.5	36.0	37.4	40.6	46.4	52.2	55.8	55.8	51.1	44.6	38.6	35.4	44.0
Monthly	38.9	43.2	46.0	50.4	56.7	62.5	67.7	67.2	62.7	54.3	45.5	40.9	53.0
Extremes													
Record High	62	70	80	87	100	100	107	107	101	90	73	64	
Year	1964	1984	1947	1957	1983	1982	1965	1981	1944	1980	1975	1980	
Record Low	–2	–3	19	29	29	39	43	44	34	26	13	6	
Year	1950	1950	1955	1955	1954	1966	1955	1980	1965	1971	1985	1964	
Precipitation (inches)													
Water Equivalent													
Normal	6.2	3.9	3.6	2.3	2.1	1.5	0.5	1.1	1.6	3.1	5.2	6.4	37.4
Maximum Monthly	12.8	9.5	7.5	4.7	4.6	4.1	2.7	4.5	4.0	8.0	11.6	11.1	
Year	1953	1949	1957	1955	1945	1984	1983	1968	1982	1947	1942	1968	
Minimum Monthly	0.1	0.8	1.1	0.5	0.5	T	0.0	T	T	0.4	0.8	1.4	
Year	1985	1964	1965	1956	1982	1951	1967	1970	1975	1978	1976	1976	
Maximum in 24 Hours	2.6	2.0	1.8	1.5	1.5	1.8	1.1	1.5	2.4	2.2	2.6	2.6	
Year	1974	1982	1943	1962	1968	1958	1978	1977	1982	1941	1973	1977	
Snow, Ice pellets													
Maximum Monthly	41.4	13.2	12.9	T	0.6	T	—	—	T	0.2	8.2	15.7	
Year	1950	1949	1951	1985	1953	1981	—	—	1949	1950	1977	1964	
Maximum in 24 Hours	10.6	3.2	7.7	T	0.5	T	—	—	T	0.2	7.4	8.0	
Year	1950	1962	1951	1985	1953	1981	—	—	1949	1950	1977	1964	
Wind													
Mean Speed (mph)	10.0	9.1	8.3	7.4	7.0	7.1	7.6	7.1	6.5	6.5	8.7	9.6	7.9
Prevailing Direction	ESE	ESE	ESE	NW	NW	NW	NW	NW	ESE	ESE	ESE	ESE	ESE

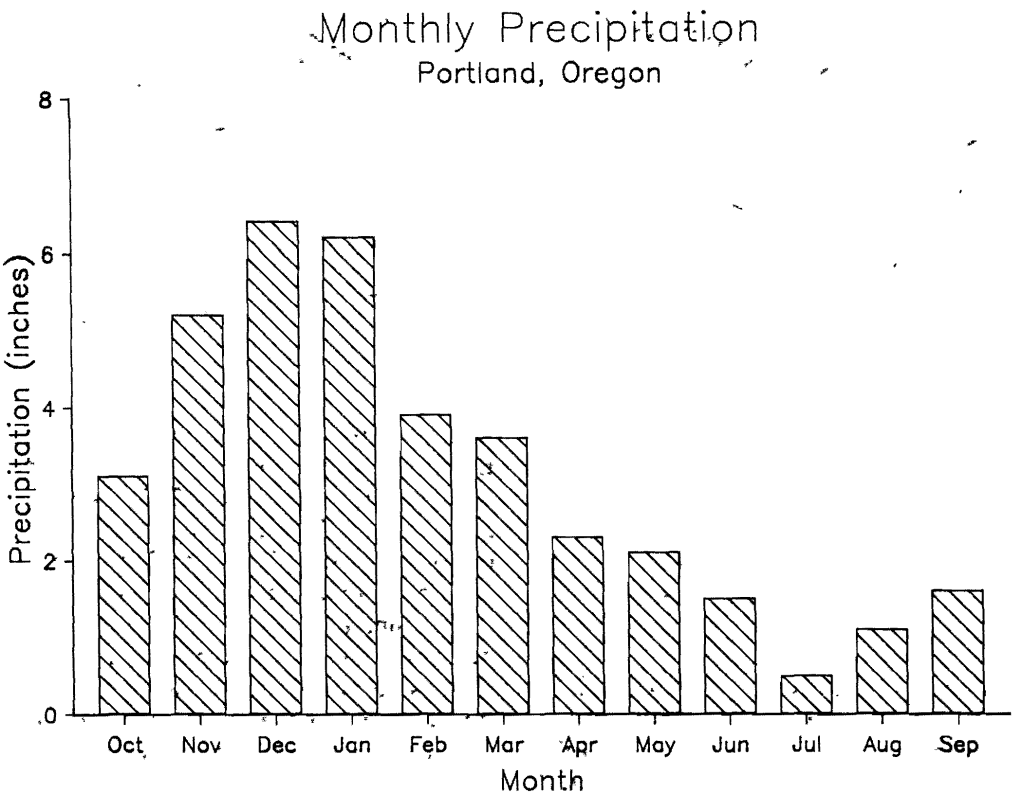

Figure 2.1: Annual march of precipitation, Portland, for the normal period 1951-1980. Data are presented according to the Water Year, October through September (from NOAA, 1986).

Willamette Valley is drier and yields less precipitation than it would in the absence of this topographic barrier. In summer, the Coast Range effectively prevents penetration of cool, marine air into the valley.

The Cascades provide an even steeper slope for orographic uplift of the moisture-laden westerly winds. The crest of the Range varies from 5,000 to 10,000 feet, and is a significant east-west precipitation divide shielding the interior Columbia Plateau from the moderating influence of the Pacific Ocean. Furthermore, the Cascade Range is an effective barrier to continental air masses that form over the interior. As a result, extreme winter and summer temperatures that characterize areas 100 to 200 miles to the east rarely occur in Portland.

The marine influence in western Oregon reduces the amplitude of the annual temperature cycle below that of continental locations. Thus the wet winter season is marked by relatively mild temperatures; the mean temperature of the coldest month, January, is 38.9°F. Also typical of a marine type of climate, the diurnal range is small in the winter when cloudy skies prevail, with a mean daily maximum in January of 44.3°F and a mean daily minimum of 33.5°F.

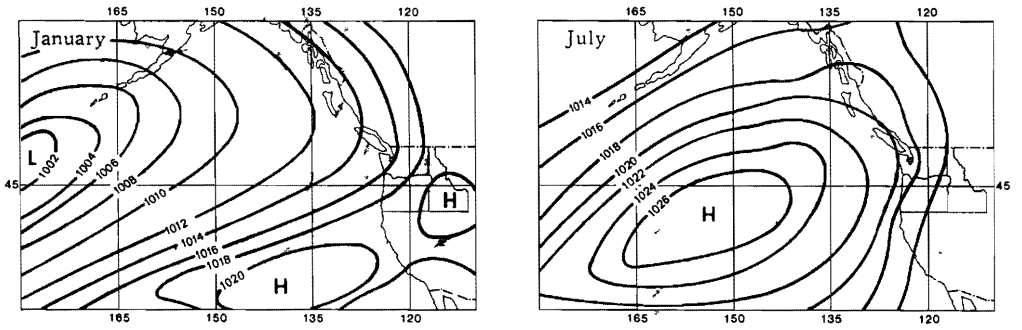

Figure 2.2: Generalized air pressure and wind conditions for the eastern Pacific Ocean and western United States, January and July, depicting dominant seasonal modes of atmospheric circulation that influence the climate of Portland (Jackson, 1985, p.49).

Summer produces some of the most pleasant weather in North America, with mild temperatures and very little precipitation. In July, the warmest month, the mean temperature is 67.7°F, with a larger diurnal range than in winter attributable to clear skies (daily maximum = 79.5°F; daily minimum = 55.8°F). Temperatures below 0°F are very rare in Portland. The lowest on record is -3°F which occurred in February 1950. Temperatures above 100°F are also infrequent; the maximum of 107°F was recorded in July, 1965. Temperatures above 90°F are attained every year, but seldom persist for more than a few days. Hence, a long growing season combined with ample moisture supports prosperous agricultural activity in the rural areas surrounding Portland and is an important underlying factor in Portland's reputation as the Rose City.

Climatic normals, or averages, represent a series of constantly fluctuating values of the basic climatic elements. Calendar year 1985 offers a good illustration of the fact that climate is more than just an average of the elements which comprise it (Figure 2.4). This was a year in which many new records were established for daily maximum and minimum temperatures, a response to the dominance of continental air masses over the more moderate marine air masses for extended periods of time. July was one of the warmest months of the century, with a monthly mean of 74.1°F (normal = 67.7°F). The mean daily temperature on 30 of the 31 days exceeded the norm and for 11 days the daily maximum was above 90°F, an unusually long spell of hot weather.

Conversely, the year began and ended with well below normal winter temperatures. January and February were extremely cold due to the anchoring of a high pressure ridge over the Pacific Northwest, permitting the influence of a continental air mass with clear skies. November 1985 was the coldest November on record, in spite of several warm days at the beginning of the month. During one 10 day sequence there were eight days in which the temperature remained constantly below freezing, an unusually prolonged cold spell for Portland. The monthly mean of 37.3°F was 8.2°F below normal. After a few relatively balmy days in December, there followed another remarkable se-

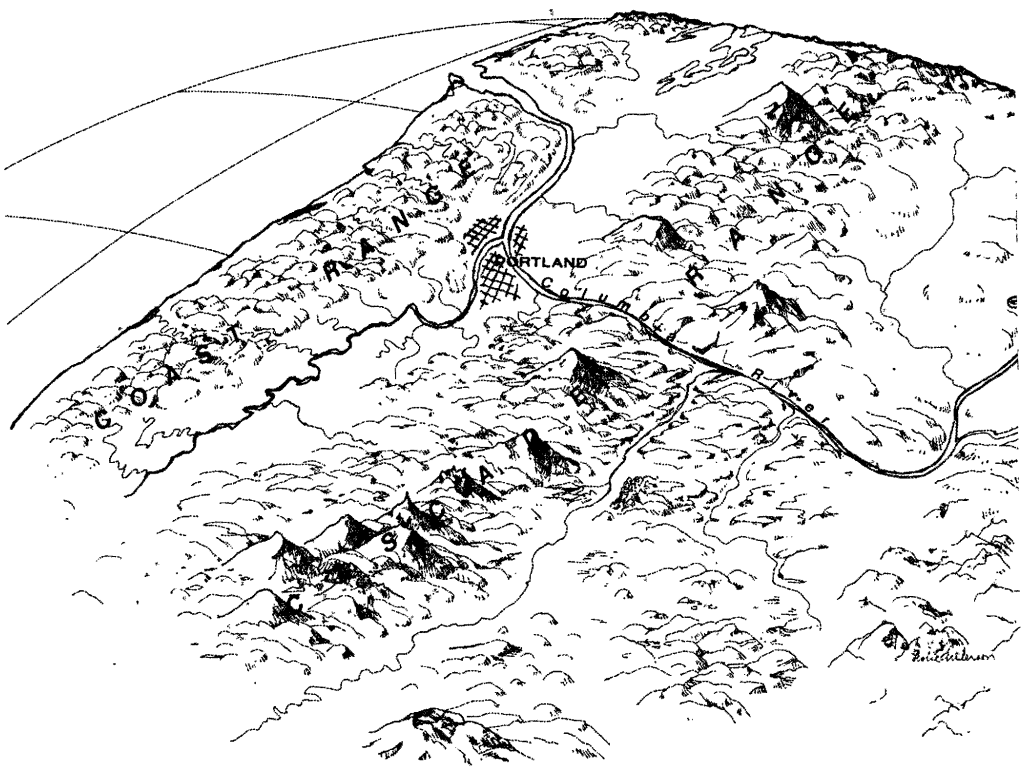

Figure 2.3: Regional setting of Portland, illustrating the major topographic controls on climate. Drawing is not to scale.

quence of cold weather extending to the end of the month. Fortunately the area was released from this icy grip on New Year's Day, 1986, with the arrival of a marine air mass that raised the temperature to a high of 51°F.

EXTREME METEOROLOGICAL EVENTS

The Portland area, indeed the entire Pacific Northwest, is generally immune from the effects of severe storms which so often create havoc in other parts of the world. For example, the combination of climatic controls is not conducive to the formation of hurricanes and tornadoes. From 1953 to 1976 only 23 tornadoes were reported in Oregon and 24 in Washington, and most of these were east of the Cascades. These numbers pale in comparison to the 1,326 tornadoes reported in Oklahoma during the same period (Ahrens, 1985, p. 406). Severe thunderstorms, while common east of the Cascades, are also rare in the Willamette Valley. Air mass thunderstorms require vigorous convective uplift in a humid atmosphere, a situation uncommon in Portland where the warm, sunny summer days that would promote convective activity are also days in which a dry air mass dominates the region. Likewise, forced lifting along a frontal boundary is rarely rapid enough to

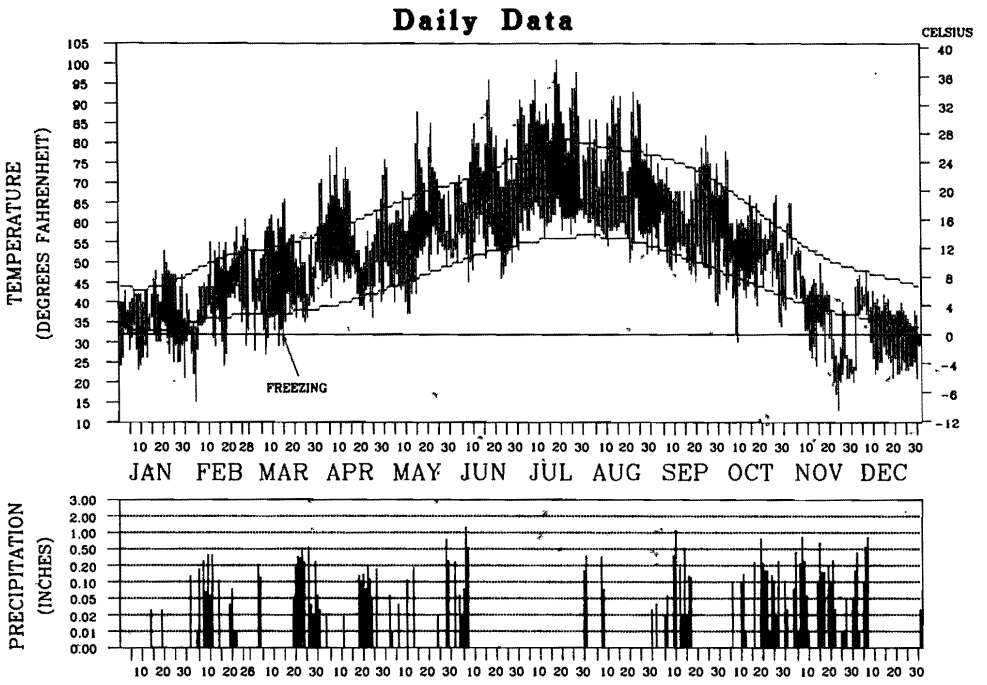

Figure 2.4: Annual march of daily temperature and precipitation in Portland for Calendar Year 1985. Data are for National Weather Service station (NOAA, 1986, p. 1).

spawn thunderstorms. The National Weather Service reports an average of only 7.1 thunderstorms per year in Portland, the majority occurring from April to August (NOAA, 1986).

Extreme meteorological events in the Portland area are generally restricted to two types -- 1) mid-latitude cyclones which on occasion are very severe; and 2) winds and precipitation influenced by the Columbia River Gorge. In the minds of most long-time residents of northwest Oregon, the single most frightening meteorological event of this century was the famous Columbus Day Storm of October 12, 1962, one of the most vigorous and destructive of its type ever recorded along the west coast (Lucia, 1963; Lynott and Cameron, 1966). In many places new records of extreme winds were established and damage was in the millions of dollars. Contrary to popular reports in the press, this was not a hurricane or tropical storm, but a mid-latitude cyclonic storm unusual for its severity and its early season occurrence. Wind gusts on Mount Hebo in the northern Oregon Coast Range at 3,000 feet elevation were estimated at 170 miles-per-hour. In downtown Portland gusts of 116 miles-per-hour were recorded at the Morrison Street Bridge, exceeding any previous records for the metropolitan area (Harper, 1962).

The storm of November 13, 1981, was a similar event that howled up the Oregon coast, generated by an intense low pressure cell. Ninety mile-per-hour winds, flooding, and widespread devastation in Brookings and Coos Bay were

reported from the south and central coast. It swept into Portland shortly after midnight with hurricane-force winds that ripped roofs from buildings and tore a supertanker from its Swan Island mooring. Power lines and radio towers were toppled, trees uprooted, motor homes crumpled, and aircraft upended. Throughout Oregon the storm took 11 lives and caused $33 million in damage (Cody, 1985, p.7).

Infrequent severe storms of this type highlight the difficulty of weather forecasting in Portland and the Pacific Northwest. Despite major technological advances that have made weather prediction a science instead of a mysterious attempt at outguessing the gods, meteorologists claim that the Northwest remains one of the trickier regions in the country to forecast (Read, 1983). A primary reason is the paucity of surface observations over the Pacific Ocean. Forecasters thus look to satellite photographs for information. These give immediate data on the higher levels of the atmosphere, but only limited surface information can be obtained from them. Furthermore, satellite photos are not detailed enough for local forecasts which are so often confounded by the complex influences of local topography.

Another source of headaches and sleepless nights for local forecasters, and a compelling example of the influence of topography on climate, both on the local and regional scale, is the Columbia River Gorge. This remarkable transverse valley is a topographic feature of unparalleled natural grandeur sculptured by the Columbia River (Figure 2.3). It offers a low-elevation passage through the Cascades, thus permitting a transition from the marine type climate of western Oregon to the continental type of the interior (Lynott, 1966). In response to prevailing regional pressure gradients the majority of air movement through the Gorge is from the west to east allowing marine air to modify temperatures east of the Cascades in both summer and winter.

The Gorge has been described as a giant wind funnel. Westerly winds can become quite strong, and are often observed as far east as Pendleton. However, it is the less frequent but normally more violent east winds, induced by a reversal of the regional pressure gradient, that are of particular concern to Portland. These may occur at any time of the year, but are most common in the winter when a cold-core anticyclone located over the interior blocks storm movement through the Pacific Northwest. Polar air nocturnally cools and deepens east of the Cascades in the Columbia and Snake River Basins, forming a large pool of cold air. The Cascade Mountains form a natural barrier that traps this cold air mass, and the only escape is through the Columbia River Gorge, the Frazier River Valley in British Columbia, and to a lesser extent the low passes in the Cascades (Baker and Hewson, 1978).

Occasionally, cold air in the Great Plains spills over the Rockies into the interior basins and intensifies this east wind surge. It is a synoptic pattern that typically persists for several days and has been known to last for several weeks, sustaining strong easterly flow through the Gorge into the Portland metropolitan area (Cameron and Carpenter, 1936). For this reason Portland is generally windier and colder than nearby cities to the north and south. The record low temperature of -3°F recorded in February 1950 was due to the influence of these easterly winds. Freezing rain is another hazard that area residents are exposed to because of proximity to the Gorge. If high pressure to the east coincides with a fall of air

pressure along the coast as a frontal system approaches, the regional pressure gradient is increased and the flow of east winds through the Gorge accelerated. A shallow layer of cold air clings to the surface and temperatures remain very cold in Portland. As the moisture-laden air from the Pacific moves inland it rides aloft over this cold layer, a combination of events that produces freezing rain, or as it is commonly termed in Portland, a "silver thaw." One such event occurred in early January, 1979, as the first rains from an approaching Pacific storm fell into a frigid surface layer and coated all surfaces with clear ice. Electric power, communications, transportation, and all normal work routine broke down in most of Portland, most dramatically in the eastern part of the city near the west end of the Gorge (Decker, 1979).

In this kind of synoptic situation all kinds of precipitation can occur in northwest Oregon, depending on the temperature balance as controlled by elevation, distance from the sea, and proximity to the Gorge. It is a unique, and devastating, mix of topography and climate that makes the beautiful Columbia River Highway, paradoxically, the most treacherous stretch of highway in the country. While other regions in the country experience ice storms, the topography ensures that the Columbia River Gorge and those areas exposed at either end of it will be subjected to more onslaughts than most. Several years may go by without such an event, but it may also occur with alarming frequency in the space of a few years. Within the metropolitan area itself the severity of such storms and the pattern of minimum temperatures due to the Gorge winds will vary dramatically. While the east side of town may be buffeted by cold Gorge winds and freezing rain, the Tualatin Valley to the lee of the West Hills may be relatively balmy. East wind events in the summer cause a different sort of problem, importing high temperatures and low humidities to northwest Oregon and southwest Washington. At these times, residents of the area watch for the return of more moderate marine air and forest managers take special precautions against forest fires. Most of the historically great forest fires in Oregon and Washington, notably the great Tillamook Burn of the 1930's, were driven by hot, dry east winds (Johnson and Dart, 1981).

SPATIAL PATTERNS

The unique setting and the complex topography within the Portland metropolitan area generates a fascinating mosaic of microclimates, patterns of climatic elements that are as complex as those for any metropolitan area in the country. Precipitation patterns are well documented thanks to data collected from the Portland Mesoscale Precipitation Network, a network managed by the Bonneville Power Administration and operational since the late 1960's. Winter storms traverse the area on prevailing west to southwest winds, distributing precipitation in a pattern highly correlated with topography. The spatial distribution is essentially repeatable from storm to storm throughout the rainy season. This topographic control is apparent in the pattern of annual precipitation, yet not all valleys are equally dry, nor are similar elevations in the hills equally wet (Figure 2.5).

The least surprising aspect of the annual pattern is the west to east precipitation gradient, a steady decrease down the east slope of the Coast Range and a steady increase up the west slope of the Cascade foothills. Elevated areas within the valley, e.g. the Chehalem

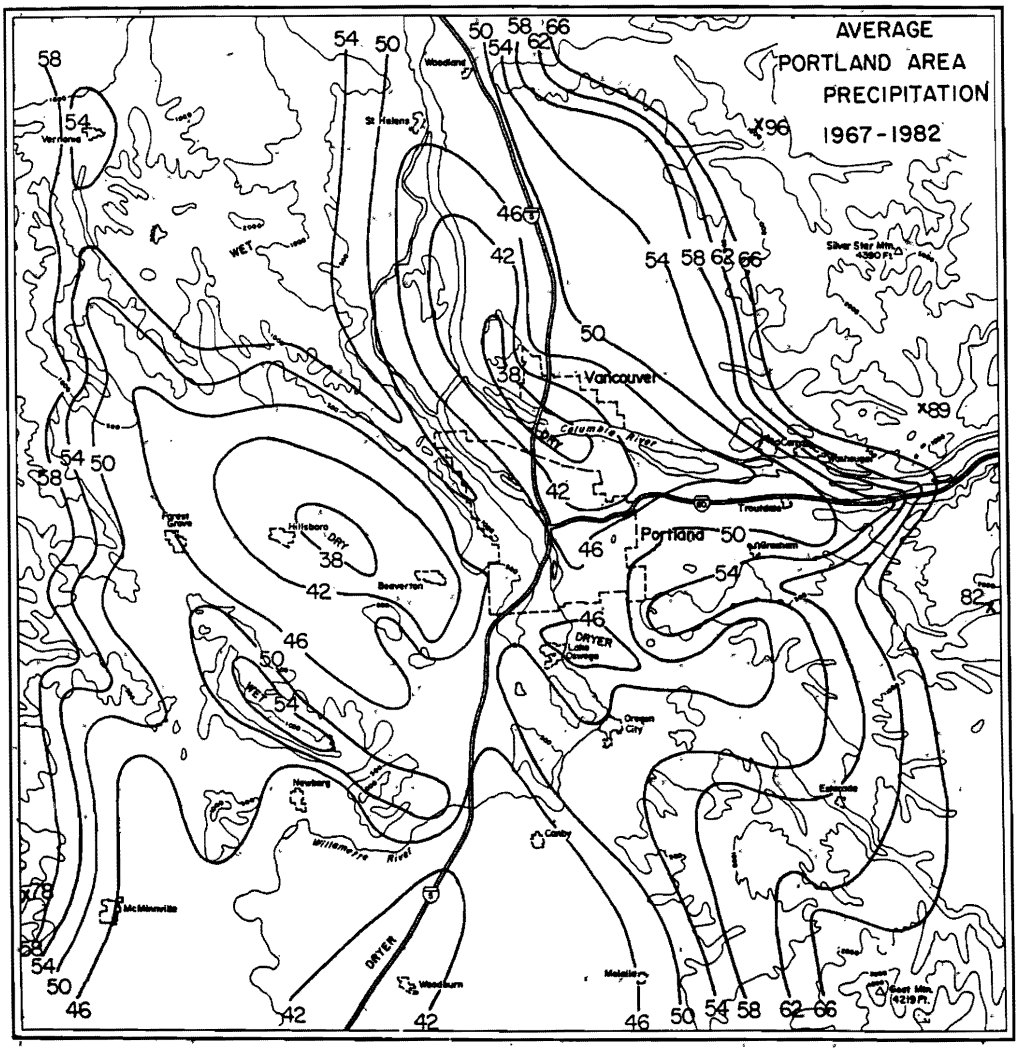

Figure 2.5: Average annual precipitation, in inches, for the Portland metropolitan area (1968-1982). Relatively wetter and drier areas are marked (Wantz, et al, 1983, p. 13).

Mountains southwest of the city and the West Hills which flank downtown, receive greater amounts of 54 inches per year. Immediately downwind of the Chehalem Mountains lies the Tualatin Valley, where the 15-year average rainfall is as little as 38 inches in a large area between Beaverton and Hillsboro. This valley may be the driest area in northwest Oregon. The other "dry" area has been recognized for years because the Portland National Weather Service Office lies at its eastern edge. This is a long, narrow rain shadow along the Columbia River lying to the lee of the West Hills. The 15-year average rainfall at the Portland National Weather Service Office is 38.7 inches (compared to 37.4 inches, the climatic "normal"

from Table 2.1). It would be difficult to find a more unrepresentative location for the city's official precipitation measurements (Wantz, et al, 1983).

The West Hills rise more than 1,000 feet above the surrounding lowlands and receive over 47 inches of orographically enhanced precipitation, 25 percent more than the adjacent Tualatin Valley. The increased amounts of precipitation in the West Hills are significant to local residents in the winter when monthly mean temperatures at the 1,000 foot level average 5°F lower than at the National Weather Service Office. Annual snowfall here averages about 24 inches, nearly three times the average in the lower valley areas. Residents of the West Hills are occasionally surprised by a six inch snowfall that severely hampers travel across the steeper terrain, while suburban areas at lower elevations nearby may have no snow whatever.

Temperature data from this mesoscale network are a fairly recent addition and are collected at a smaller number of stations. The major control on the spatial pattern of temperature in the metropolitan area is elevation. Thus, outlying areas are cooler than is the city center adjacent to the Willamette River. However, due to the combined influences of land use, cold air drainage, and proximity to the Columbia River Gorge, a consistent temperature-elevation relationship does not exist. Low-lying areas frequently have exceptionally cold nights, and east side locations tend to be colder than at similar elevations on the west side.

The interaction of temperature, atmospheric moisture, and topography dictates the pattern of fog in the metropolitan area, a climatic element for which few data exist. The National Weather Service reports an average of 33.6 days per year during which heavy fog restricts visibility to 1/4 mile or less (NOAA, 1986). But such "point" data do not tell the real story of the spatial patterns of fog in an area where the topography is so varied. The National Weather Service Office is located in east Portland on the Columbia River, adjacent to the Portland International Airport. It is a site well-exposed to easterly Columbia Gorge winds which effectively dissipate fog that may persist in other parts of the metropolitan area. Therefore, data from this station are not representative. Happily, the location of the airport is such that it is not subject to frequent closures due to fog and reduced visibility, a problem of greater magnitude at other cities in the Pacific Northwest, for example Medford in southern Oregon and Sea-Tac Airport in Seattle.

The combination of cold air drainage and high moisture content in river valleys makes them susceptible to radiation fog, which occurs frequently when regional high pressure dominates the area, a common occurrence at any time of the year. At times the low-lying areas are completely shrouded while the hills remain bathed in sunlight. Radiation fogs tend to form upward from the ground as the night progresses and are usually deepest around sunrise. A shallow layer will usually dissipate or "burn off" by afternoon. Advection fog is more of a winter season phenomenon, formed when relatively warm, moist air moves over colder surfaces. It is enhanced by upslope air flow, so the higher elevations in Portland are more likely to be fogged in.

Another significant environmental element directly related to the complex interaction between climate and topography is air pollution. Unfortunately, the combination of these controls in Portland precludes the efficient dispersal of pollutants. The valley setting, with

mountains on either side, inhibits horizontal dispersion, especially in the summer when winds are light and generally from the north. Pollutants cannot escape vertically when mixing is reduced by inversions that exist under the influence of high pressure, a situation common in all seasons. In fact, throughout the valleys of western Oregon there is a higher frequency of inversions than in most places in the country. In Portland, the average height of the mixed layer is 3,000 feet, and about 10 percent of the time the mixing height is below 1,500 feet, well below the crests of the flanking mountains (DEQ, 1986). Thus there is a heavy build-up of pollution with a corresponding reduction in visibility. This is both a public health issue and an aesthetic one. Many area residents gauge air quality by their ability to view two of the region's volcanic landmarks -- Mount Hood, 60 miles to the east of downtown, and Mount St. Helens, an equal distance to the north. Stagnant air, trapped under an inversion, becomes increasingly polluted until the weather changes to bring in a strong regional flow that permits vertical and/or horizontal mixing.

CLIMATE IN THE PAST

One aspect of the temporal variability of climate is the annual cycle; another is the variability over longer time scales. Unfortunately, observations of temperature and precipitation in Portland have been recorded for barely more than a century. For the longer period, prior to the advent of instrumental records in the 19th century, the climate of Portland can be discussed only in general terms of the climate history of the Pacific Northwest. A coarse outline for climate of the last 25,000 years in the Pacific Northwest has begun to emerge thanks to the work of several investigators, most recently Heusser (1983) and Barnosky (1984). In these studies paleoecologic data have been used to interpret precipitation and temperature for the late Pleistocene and early Holocene, and they have shown that the region has experienced a great range in climatic conditions, variations in temperature and precipitation that certainly exceed anything noted in the past few centuries.

For the past 1,000 years the accuracy and number of paleoclimatic indicators is greatly increased. Three such indicators yielding a wealth of information about climate throughout the American West are tree rings, lake level fluctuations, and the movements of mountain glaciers. No information specific to the Portland metropolitan area is available, but the broad-scale studies are spiced with interesting implications. Perhaps the most significant finding is that the climate of the mid-20th century is anomalous when viewed in an historical context. Bradley (1976), for example, noted that warm-moist conditions prevalent in the 1941-1970 period have not occurred since the 14th century. Furthermore, there is a growing body of evidence that, for the globe as a whole, the extreme inter-annual variability of climate since about 1970 is more in keeping with climatic behavior over the past several centuries; the middle decades of the 20th century were unusual because of low inter-annual variability. Extreme events in the 1970's such as severe winters in the central and eastern United States and drought in the west have certainly done nothing to refute this finding (Diaz and Quayle, 1978; Shelton, 1977).

Nevertheless, it is only for the period of instrumental observations that precise statements can be made about the climatic history of Portland. Data collection

commenced in 1871 at a downtown station, which became the official U. S. Weather Bureau station when that agency was established in 1892. Service continued uninterrupted until 1973. Coincident with the closure of this station was the addition of the downtown KGW-TV station to the cooperative climatological network. Thus, a nearly homogeneous record of temperature and precipitation is available since 1871.

These data can be analyzed in the context of climate variability for the northern hemisphere and for the Pacific Northwest. Mean annual temperature in Portland shows a steady increase from 1872 through the mid-1940's (Figure 2.6). Studies of instrumental records from throughout the northern hemisphere document the much discussed general warming trend from about 1850 to the 1940's (Mitchell, 1961; 1963), attributable in part to increased levels of carbon dioxide in the atmosphere. After about 1940 there was a reversal of this trend and general cooling into the 1970's, primarily at middle and high latitudes (Jones, Wigley, and Kelly, 1982). Causes of this cooling episode are likely multiple, including solar variability (Willett, 1974;

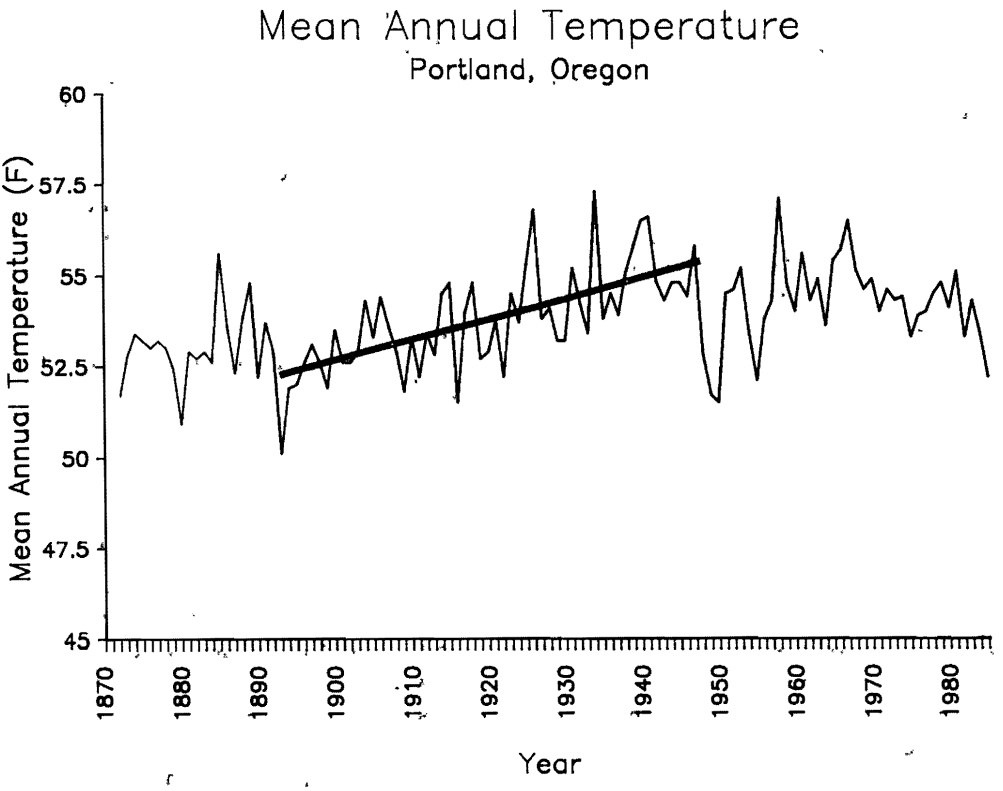

Figure 2.6: Time series of mean annual temperature, Portland, 1872-1985. Data are from downtown station through 1972 and Portland KGW-TV beginning in 1973.

Agee, 1980) and volcanic activity (Oliver, 1976). However, temperature and precipitation anomalies on a regional basis do not necessarily reflect the hemispheric trend. For example, much of the western half of the United States experienced a slight warming while the rest of the nation experienced the cooling documented for the northern hemisphere as a whole (Wahl and Lawson, 1970).

In Portland there is no clear evidence of either progressive warming or cooling since the 1940's. However, the analysis of temperature changes over time is complicated by many factors, not the least of which is the influence of human activity. Due to changes in the heat balance associated with urbanization, cities tend to be warmer than the surrounding countryside. Likewise, the growth of a large city like Portland may account for warming noted during the first half of the century.

Precipitation data are less sensitive to the effects of urbanization (Figure 2.7). The decade of the 1870's and the early 1880's were extremely wet; in Water Year 1883 Portland received an incredible 71.8 inches of precipitation. Annual amounts declined steadily through the 1920's and early 1930's, a time of widespread drought in North America, and then increased steadily through the 1960's. The decade of the 1970's is marked by extreme year-to-year variability, a finding consistent with the global climate as discussed above.

CLIMATE OF THE FUTURE

Although it is impossible to forecast future climate with any confidence, scientists have rapidly increased their understanding of short-term anomalies in temperature and precipitation. Year-to-year variability of climate in the Pacific Northwest is due to fluctuations in the jet stream; i.e. changes in location of mean ridges and troughs in the windflow in the middle and upper troposphere. The location and intensity of these features appears to be critically influenced by sea-surface temperature anomalies, and investigations for the North Pacific and the North Atlantic Oceans have demonstrated interactions with the atmospheric circulation on a near-hemispheric scale (Namias, 1969). For example, an extensive, relatively warm pool of surface water in the north-central Pacific in the winter of 1971-72 contributed to a northward displacement of the westerly jet stream together with a compensating southward displacement over the western United States, bringing in cold air (Figure 2.8). This pattern contrasts with that of the 1960's when anomalous cold sea-surface temperatures persisted in the central Pacific with warmer water to the west, leading to frequent storm development in the intervening zone of strong temperature gradients. The associated upper airflow produced a ridge of high pressure over the American West with warm winters in California and the Pacific Northwest (Barry and Chorley, 1982).

The most famous drought of the American West in recent memory was that of 1976-77. For much of the Pacific Northwest this was the driest winter on record (Bates, 1978). Portland, for example, received 27.6 inches at the downtown station, 65 percent of the long-term normal. Namias (1978) demonstrated the cause linked to sea-surface temperatures. In the autumn of 1976 to February, 1977, warmer water and a strong upper-air ridge persisted near the west coast. Cooler waters and a persistent trough were located toward the central Pacific. In other words, it was a more extreme example of the

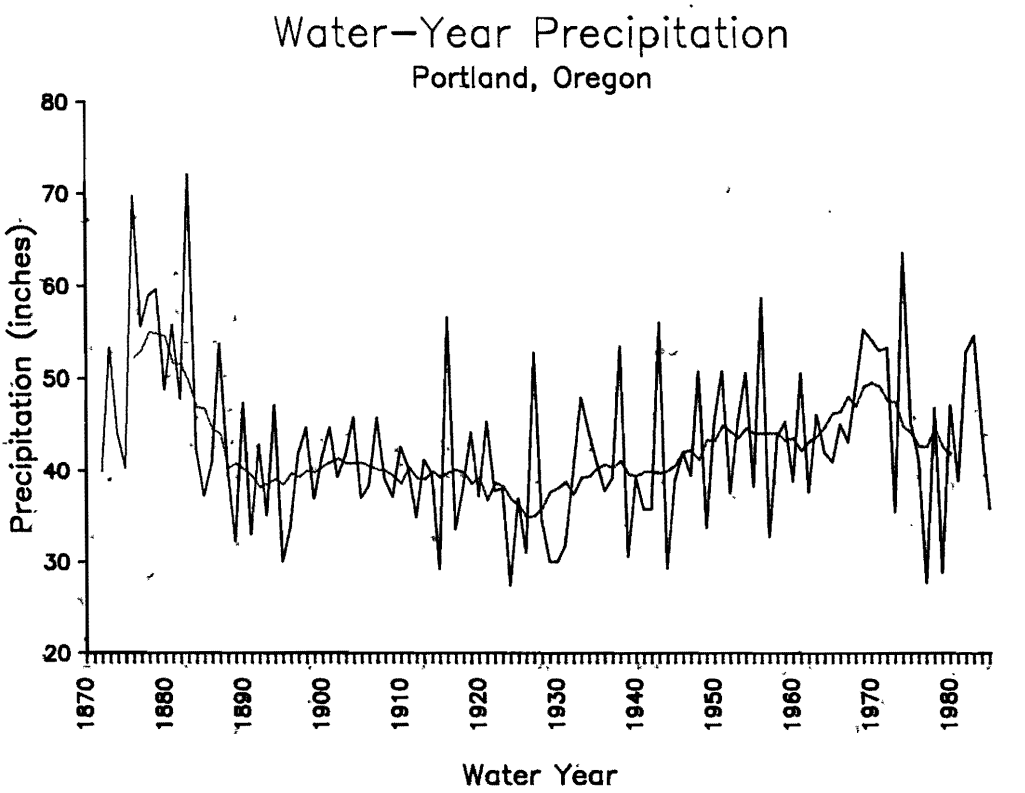

Figure 2.7: Time series of annual precipitation, Portland, 1872-1985. Data are from downtown station through 1972 and Portland KGW-TV beginning in 1973. Annual totals are for the Water Year (October through September).

situation presented in Figure 2.8 for the 1960's.

In recent years the concept of atmospheric teleconnections as related to sea-surface temperature patterns has taken on a new dimension with recognition of the ocean-atmosphere phenomenon called El Nino-Southern Oscillation (ENSO) which occurs in the equatorial Pacific Ocean. ENSO is identified as a weakening in the normal gradient between high pressure centered in the central Pacific off the coast of South America and low pressure in the Indian Ocean near Australia (Rasmusson, 1985). Recent research has clearly demonstrated that there are world-wide effects derived from an ENSO event. A decrease in the pressure gradient results in displacement of the normally occurring weather systems in the middle latitudes, and is termed the Pacific North American (PNA) Teleconnection. The shift in normal circulation in the eastern north Pacific and over the continental United States has been observed to result in associated shifts in storm tracks and temperature patterns. Lough and Fritts (1985) showed that during an ENSO event precipitation, particularly in the winter, tends to be less than normal over the Pacific Northwest due to a southern displacement of the usual storm track. In addition, temperatures

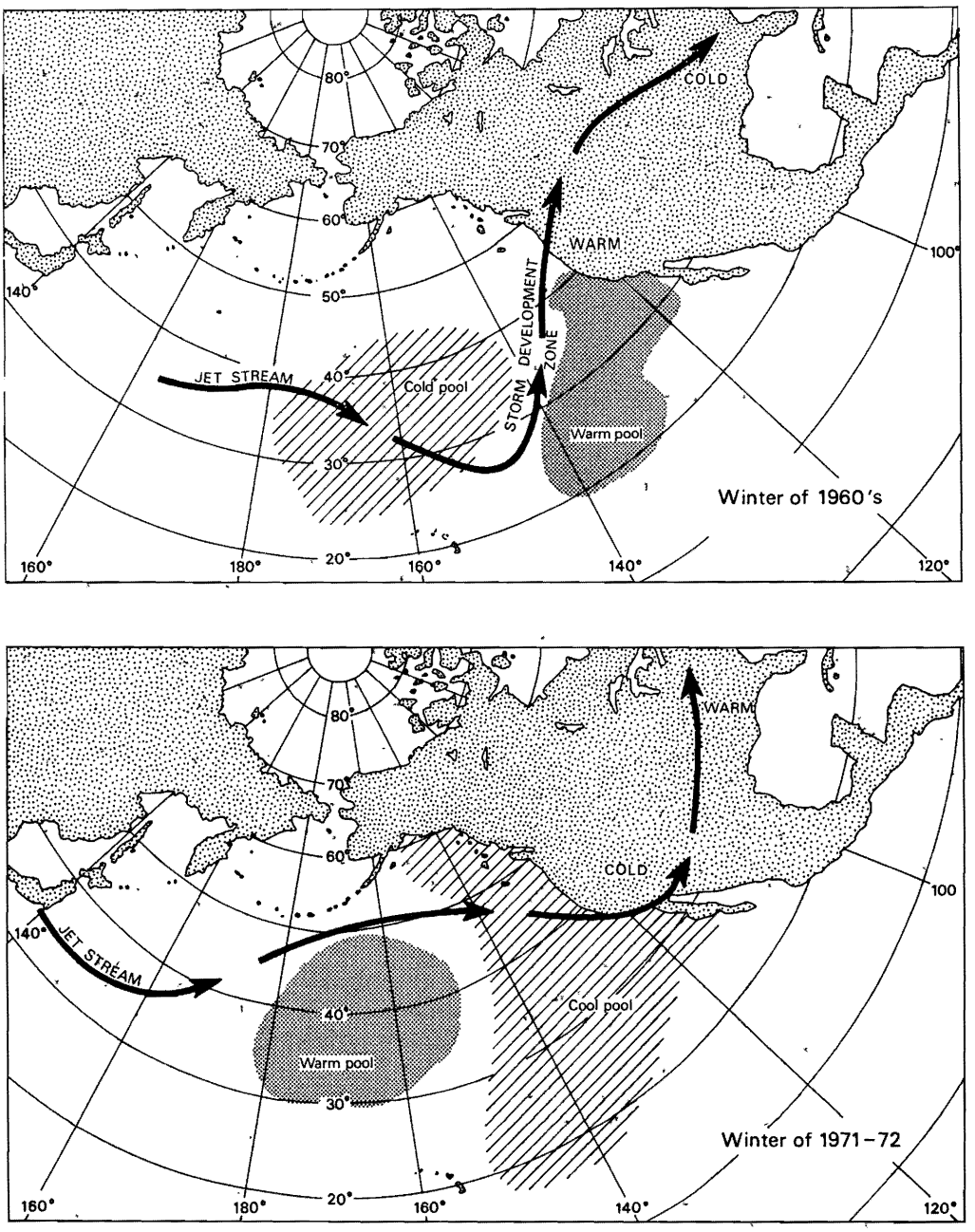

Figure 2.8: Generalized relationships between ocean-surface temperatures, jet stream tracks, and land temperatures over the North Pacific and North America during average winter conditions in the 1960's, and the winter of 1971-72 (Barry and Chorley, 1982, pp. 192-193).

tend to be warmer than normal over the Pacific Northwest.

Only a few years ago distant events such as a warming in the equatorial oceans would have appeared to hold little relevance for the weather and climate of Portland. Although these atmospheric teleconnections are not yet adequately defined for reliable monthly and seasonal forecasting, it is a field in which knowledge is accumulating rapidly. Yet, in spite of advances in our understanding of climate – in its controlling mechanisms and in its natural variability -- the "ideology of climate" for Portland and the Pacific Northwest is still relevant. Rainfall in Portland is, indeed, prolific; but the mild winters and the pleasant summers blend with a beautiful and accessible physical and cultural environment to enhance a lifestyle valued by local residents.

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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

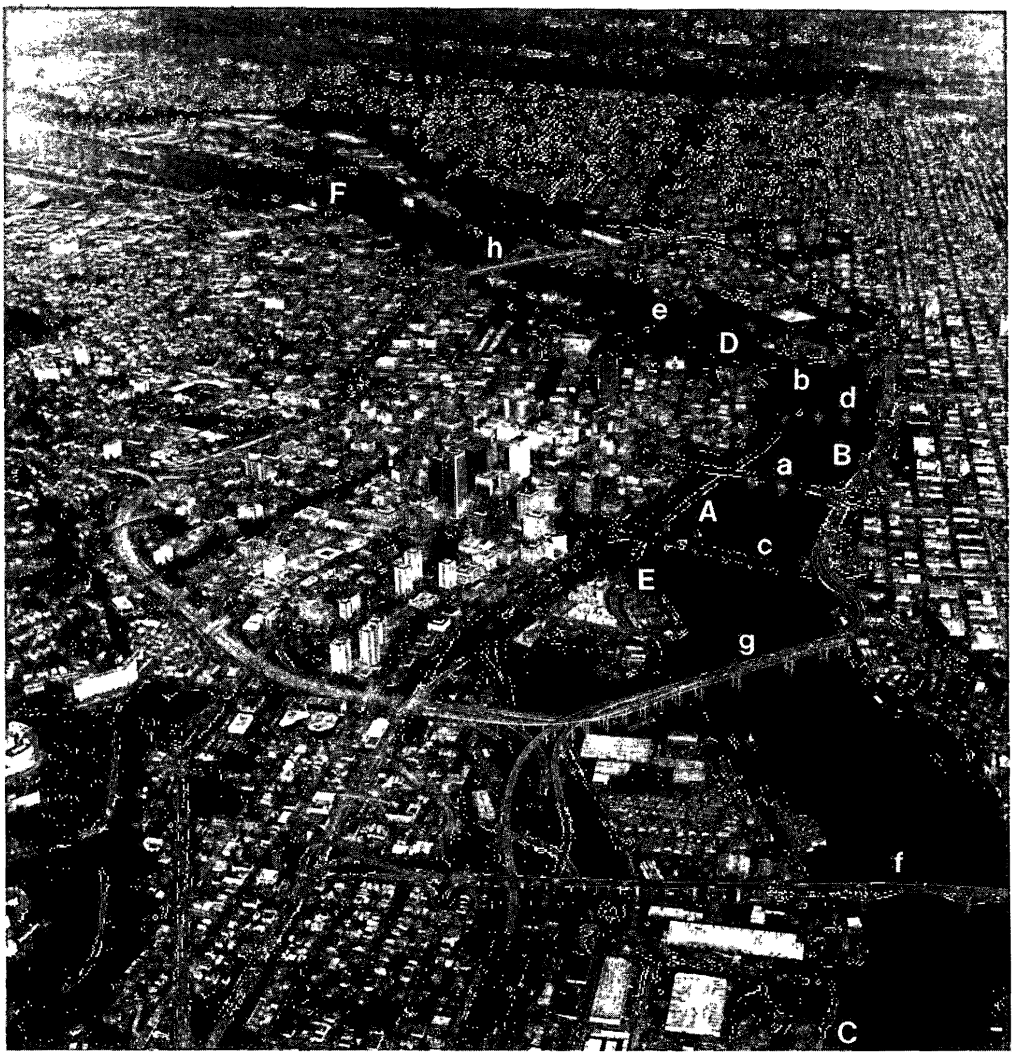

Figure 3.1: View of Portland towards the north. (A) Downtown Waterfront, (B) East Central Waterfront, (C) Johns Landing, (D) McCormack Pier, (E) RiverPlace, (F) Swan Island. Bridges are (a) Morrison, (b) Steel, (d) Burnside, (e) Broadway, (f) Ross Island, (g) Marquam, (h) Fremont. The distance between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

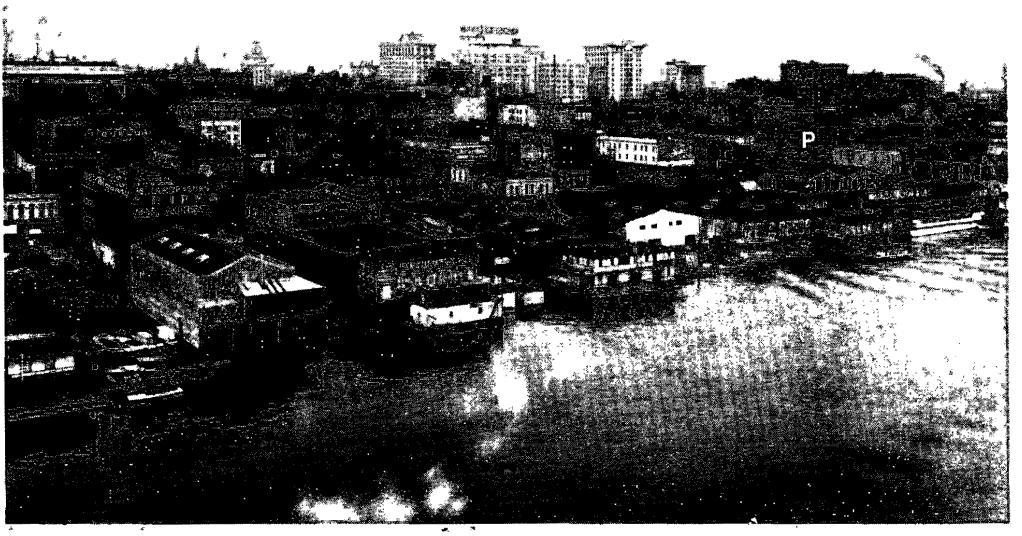

Figure 3.2: Portland waterfront in 1915. View toward the west. Note absence of ships along the waterfront. To avoid harbor congestion, vessels were berthing downstream. In upper center of photo is the central business district which had moved away from the river to avoid flooding. Its elevation of 50-60 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

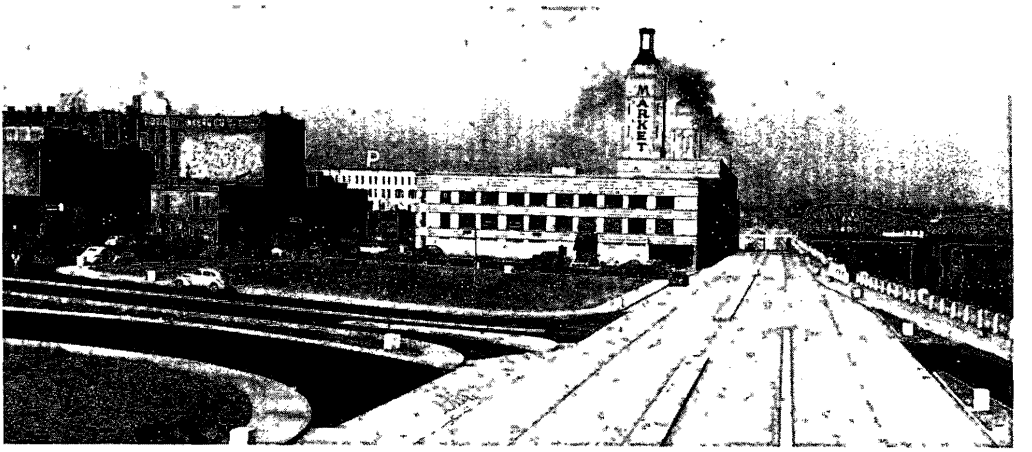

Figure 3.3: Harbor Drive in 1944. View is to the north. Front Avenue is small road to the left side of photo. The seawall is on the right. Some of the oldest buildings were razed to make room for the project. The Public Market shown here, completed in 1933, remained. The bridge is the Morrison which 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 recommended 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

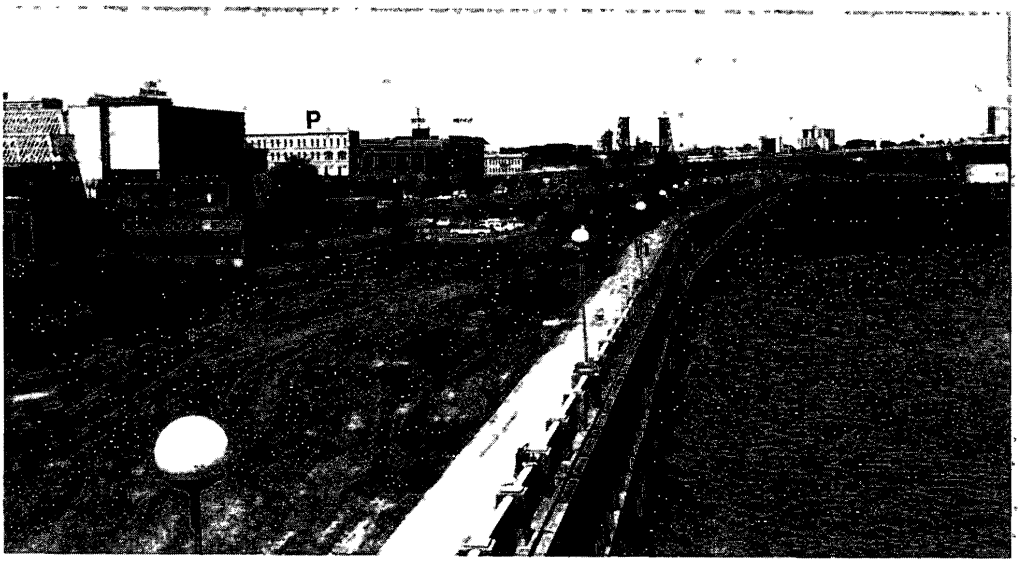

Figure 3.4: Tom McCall Waterfront Park (1978). View along the seawall looking north. The worn appearance of the ground is due to heavy crowd use associated with events such as Neighhbor Fair. Willamette Center is on the left of the photo. Buildings on the left are on the west side of Front Avenue and 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

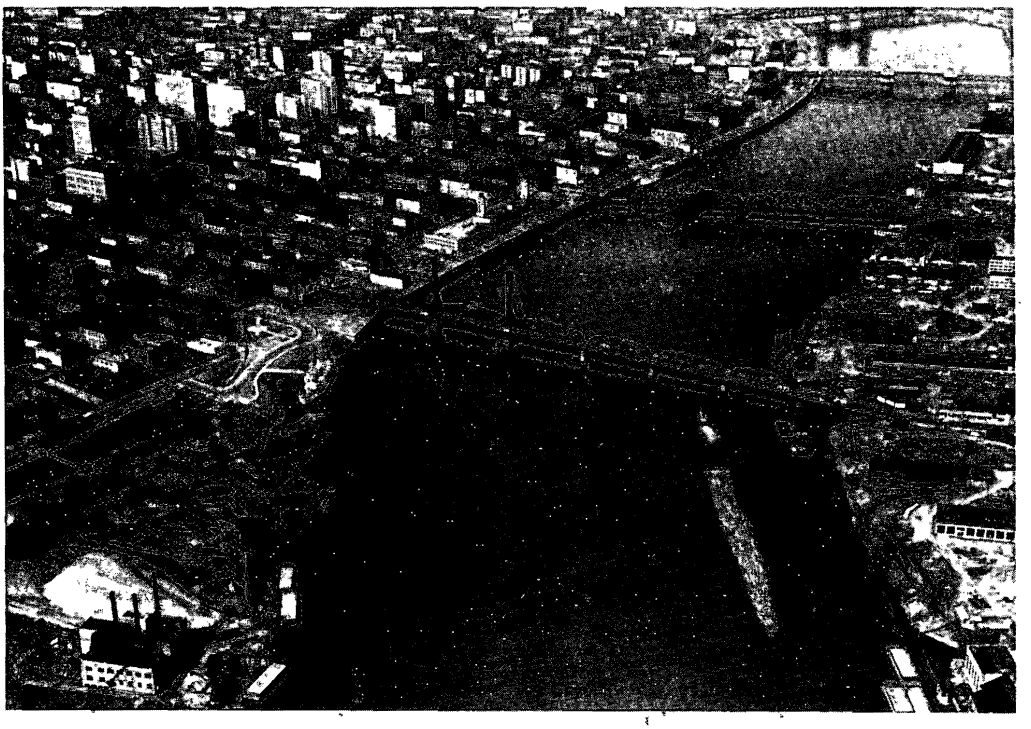

Figure 3.6: View toward west side of the river looking north (1938). Pacific Power and Light Steam Plant is in lower left of photo. Sawdust pile for fuel is north of the plant. The bridges shown from south to north are Hawthorne, Morrison, and Burnside. The twin towers of the Steel Bridge are reflected in the river at the north edge of the photo. The battleship Oregon is anchored on the 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 fasted 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 interested 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	1958	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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Chapter 4
Changes in Downtown Portland

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HISTORICAL DEVELOPMENT

Like the downtown of most American cities, the original factors which led to Portland's location have little to do with its current role but much to do with its current form. In the mid-19th century, a location at the confluence of the Columbia and Willamette Rivers was believed to provide the best transshipment point for the entire Pacific Northwest, since it was the limit for ocean going vessels, and provided river access to Oregon and eastern Washington as well as the productive farmlands of the Willamette Valley. The specific location chosen for Portland was a natural wharf area on the west bank of the Willamette -- the only area along the river where firm ground came down to the water (Dotterrer, 1974).

As the 19th century advanced, this selected location lost its original purpose. The larger ocean-going vessels found it difficult to turn around in the narrow width of the Willamette at the downtown location, and major port activities migrated down river. At the same time, the introduction of railroads made inland waterways of less significance to commerce, while the much finer harbor of Puget Sound encouraged the transcontinental railroads to choose the Seattle area for their termini. As a result, Portland lost its role as the primary center of the Northwest. Nonetheless, the original location had developed into a downtown with sufficient population and commercial connections to sustain itself and remained fixed in location (Figure 4.1).

The original Portland was laid out in a small scale grid (200 by 200 foot blocks with 60 and 80 foot streets) on a sloping plain which led from the river to the West Hills - a long, high ridge running roughly parallel to the river. As befits a river town the grid was oriented to the river rather than the compass. This grid of small blocks was broken about half of the way back from the river by a set of narrow (100 foot) blocks reserved as a linear park. This park formed the boundary between the riverward portion of town with its small lots (eight per block) and the hillside portion with large lots and in some cases larger blocks (Figure 4.1).

The early town concentrated along the river with combination wharf/warehouse/office buildings on the river and similar buildings in blocks behind. Beginning in 1872, this district was served by north-south horsecar routes. As the town expanded, the original angled grid was abandoned in favor of a grid aligned with the compass points. This created two disjunctions in the street system which became natural break points, demarcating the edge of the city's core (see Figures 1.2 and 4.1).

The extensions north and south were at least at the river front, into marshlands which, when filled, provided large flat land areas unbounded by the small scale street grid. At the

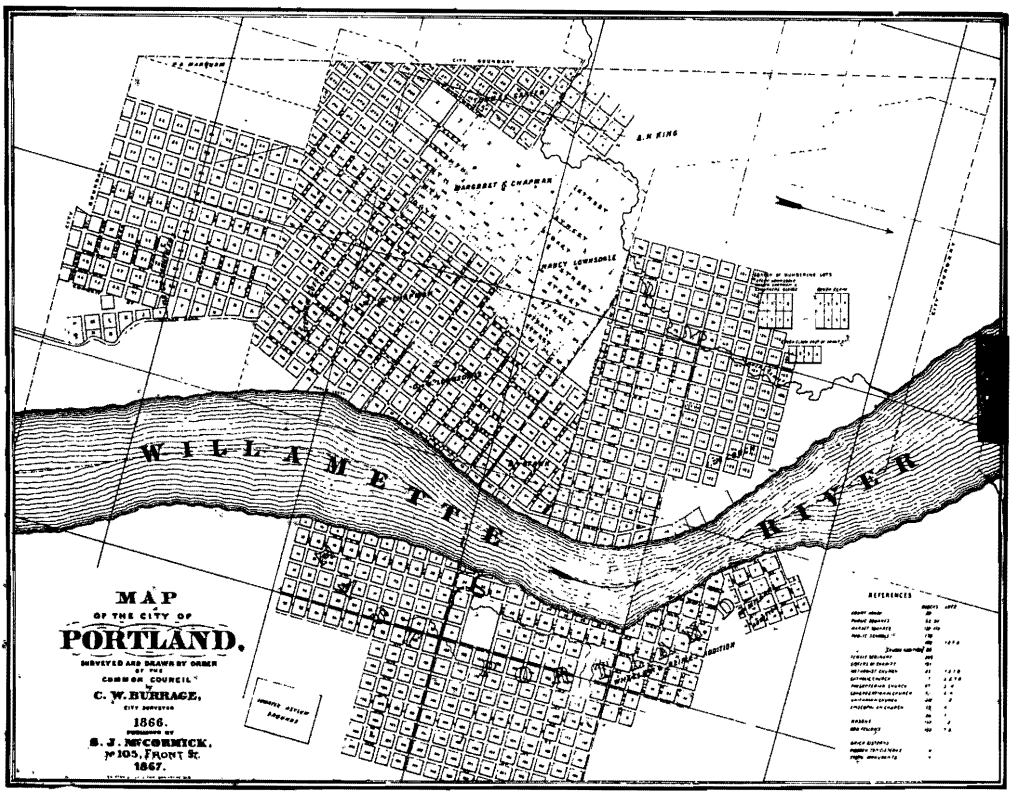


Figure 4.1: *Map of Portland, Oregon in 1866 (north is to the right) showing the original street grid at right angles to the river. The later additions oriented to the compass points created "breaks" in the street pattern which for many years demarcated the limits of "downtown" Portland (Oregon Historical Society Negative #ORHI23568).*

north end, the railroads erected a union station at a large yard. The waterfront lands to the south were used by lumber mills and other land-extensive industries requiring water transportation.

The wooden buildings of the original waterfront were rapidly replaced with brick and cast iron buildings of two to four stories. As the city expanded these buildings were occupied almost exclusively by wholesale and small manufacturing operations (see Figure 3.2). In the late 19th century, the retail trade and the major office activities moved westward into a district of white brick and glazed terra cotta buildings which became the 20th century "downtown." This district focused around the federal courthouse/post office and the Portland Hotel, both located at Sixth and Morrison.

The construction of railroad lines (1872-1884) encouraged growth outside the original boundaries. North toward the railroad station a typical "station district" of tourist hotels and railroad-oriented businesses developed. In Portland, as in other northwest cities, this was associated with a "skidroad" district of single-room occupancy (SRO) hotels and other services for the single men who worked in the woods and on

farms. The area south of the original plat, by contrast, developed as a neighborhood of wooden buildings for those who worked in the waterfront industries. The area became the residential base of several immigrant groups -- especially Jewish and Italian communities (see Chapter 5).

Most of this growth in the 1870's and early 1880's continued the city's north-south linear orientation which was driven by the river and the West Hills. Beginning in 1887, however, the first bridge (Morrison) was constructed across the river to connect the core area with the east side, which had large, generally flat areas suitable for housing subdivisions (Table 3.1). Other bridges were constructed and served the electric trolley car lines, which extended eastward into the new east side residential areas where most of Portland's residents lived by World War I. Many of these trolley lines also extended westward through the downtown core, reaching into the more dense residential neighborhoods at the base of the West Hills. An east-west axis of development was established as the streetcar lines encouraged the spread of office/retail and other urban center uses westward toward the hills. At the same time, the old waterfront buildings with small floor areas, and on a river too narrow for the largest vessels, began to decline. As a result, the downtown core area reached a kind of stasis about World War I, when Portland's "pioneer period" of explosive growth came to an end (Dotterrer, 1974).

At this time Portland leaders determined that Portland's status as a metropolis required a "City Beautiful" plan to guide future development. The "Bennett Plan" of 1912, prepared by a Chicago consultant, proposed boulevards, civic centers, and new railroad station in the core area. The plan was adopted by the voters, but the World War intervened, delaying implementation. After the war, a reduced growth rate and the needs of the automobile meant that virtually nothing in the core plan was executed. Nevertheless, the plan did mark the first "public planning" effort for Portland, and it advanced the idea that downtown was a "public" place worthy of public expenditure for enrichment and embellishment (Dana, 1912).

The automobile was a major instrument of change after World War I. While the car increased the daily "reach" of downtown by reducing travel time, it required traffic control and parking. These requirements were, of course, no different than for other cities. But Portland's small block size and narrow streets made the adjustments very difficult (Figure 4.1). Parking on site was difficult even in new buildings, and much of the older housing adjacent to the core -- and the older cast iron buildings near the waterfront -- were demolished for surface parking lots. Because of the small blocks, an economical lot required most or all of a city block, resulting in large openings and an un- urban "gap-toothed" area except in the very center of the core area. Even in the very center, the Portland Hotel was replaced by a parking lot in the 1950's. Because of the narrow streets, Portland was forced early on toward a one-way grid system for traffic except in one or two cases where significant (and expensive) street widenings were undertaken. One of these, Burnside Street at the northern break in the grid, reinforced the already existing "edge."

In the thirties the wharfs were demolished and replaced by a seawall to

eliminate the flood hazards. In 1943, Robert Moses, the New York public works czar, was hired by Portland to plan projects to employ the returning military and shipyard workers once the war ended. He proposed a waterfront highway called Harbor Drive on the site of the old wharves, which was built immediately after the War. He also proposed street widenings and a loop expressway around the central part of the city to accommodate increased automobile traffic (Moses, 1943). These plans, greatly modified, were carried out by the state highway division in the 1950's and 1960's (see Figure 3.3).

EARLY PROGRAMS OF PLANNING AND PUBLIC CHANGE

A period of planning and development began in the late 1960's, with the greatest activity in the early 1970's, followed by an active period of physical change in the late 1970's and early 1980's. Given the political leadership to carry out many of the planned projects and a healthy economy, the core was radically transformed. The individual transformations were much like those of other U.S. cities -- urban renewal clearance of "slums," a vigorous period of office construction and a growing interest in, and rehabilitation of, historic buildings. Portland's overall transformation was different than in many other cities, however, because individual changes were harnessed in support of a larger, cohesive vision of the downtown. That vision builds upon trends established by the historic development and was aided by the relatively small area of the downtown -- limited by the river and the West Hills.

In many ways, this framework has been built around transportation. In the 1960's, the city and state followed Moses' recommendation for an inner-loop freeway, which was completed in 1973. This loop has confined the downtown core even more tightly than the original topographic setting (see Figure 3.1). On the west side, the freeway isolated several large "downtown" office, club, and apartment buildings outside the downtown core. The area isolated has seen almost no new construction since the freeway was built.

The decision to build the freeway loop also meant cutting through the old south Portland ethnic neighborhoods and dividing them from the downtown. Because of decaying physical conditions, Portland's new urban renewal agency declared this area "blighted" and designated it the South Auditorium Urban Renewal District. During the planning for this district and the freeway, there was considerable dispute as to whether the freeway should be located south or north of the new urban renewal district. Ultimately, the freeway was built to the south, uniting the district with the traditional downtown and masking the disjunction between the two street grids. The South Auditorium Urban Renewal District (begun in 1958) was a total clearance project which created an entirely new neighborhood of high rise housing and offices. The public improvements were extensive and of very high quality. The overall plan created super blocks by vacating by vacating streets but kept the scale of the existing 200 foot grid by placing pedestrian ways on the former street rights-of-way and in some cases even saving existing street trees. The landscape plan, by Lawrence Halprin and Associates, was lush and creative -- providing two waterfall parks with a green resting park in between (located along S. W. 2nd Avenue from Market to Hall). These public spaces were connected by the heavily treed pedestrian-

ways which also connected the area to the surrounding grid of streets.

As this first urban renewal district developed in the 1960's, a consensus seemed to develop rather quickly on both its good and bad points. First, total clearance was bad, since it removed the stability from the community and left no history. Second, planning by subdistricts or precincts was desirable, since identifiable areas of varying character were created. Third, high quality public improvements were essential to successful redevelopment -- and a good design was essential to achieving that quality. Finally, while buildings separated from the sidewalk by landscaping were attractive, this arrangement discouraged street life and was not generally appropriate for a "downtown." Similar lessons were learned in a second urban renewal district in the southwest corner of the downtown. This district created a precinct for a state war veteran's college which was rapidly growing into an urban "commuter" university (now Portland State University). To accommodate this growth, apartment buildings and a few large old houses were demolished. The loss of housing was immediately perceived as a loss to the idea of "downtown," so much so that demolition was halted and a number of the buildings were rehabilitated as student housing.

ESTABLISHING THE OVERALL PLAN FOR DOWNTOWN

Armed with these observations -- learned firsthand and reinforced by commentary from elsewhere -- Portland launched its "Downtown Plan" era in 1970. Once again, decisions about transportation were critical first steps.

In the late 1960's and early 1970's, Portland and the metropolitan area faced several critical choices. A group of strong and creative political leaders established a consistent program which called for strengthening downtown, maintaining families in city neighborhoods and using transportation investments to meet these objectives. With the completion of the freeway loop and a number of radial freeways leading to that loop, the region was ready to add a second group of radial freeways. These were rejected because of the expected impacts on neighborhoods and air quality and the projected high cost. Instead, the funds originally earmarked for a freeway were "transferred" to a large number of transit and highway projects. The region chose to invest in a much increased transit service and to discourage auto commuters into the downtown area. The adoption of a "parking policy" which limited new parking space construction meant that from 1972 to 1982 daily traffic into the downtown remained relatively stable while employment increased by to 80,000. Increased travel to work caused by the growth in employment was handled primarily by the expanding transit system.

These transportation policy choices had three significant physical impacts on the downtown core. First, to accommodate increased bus volumes and provide an attractive environment for bus patrons as well as others, the Transit Mall was created (completed 1978). Two north-south streets through the heart of the office district were built with two exclusive bus lanes and a local access lane for automobiles (Figure 4.2). While the initial justification was clearly operational, widened brick sidewalks, trees, shelters and art work were included as essential. These decisions represented the continuing recognition that public works must be of high quality to attract private investment. Secondly, the completion of

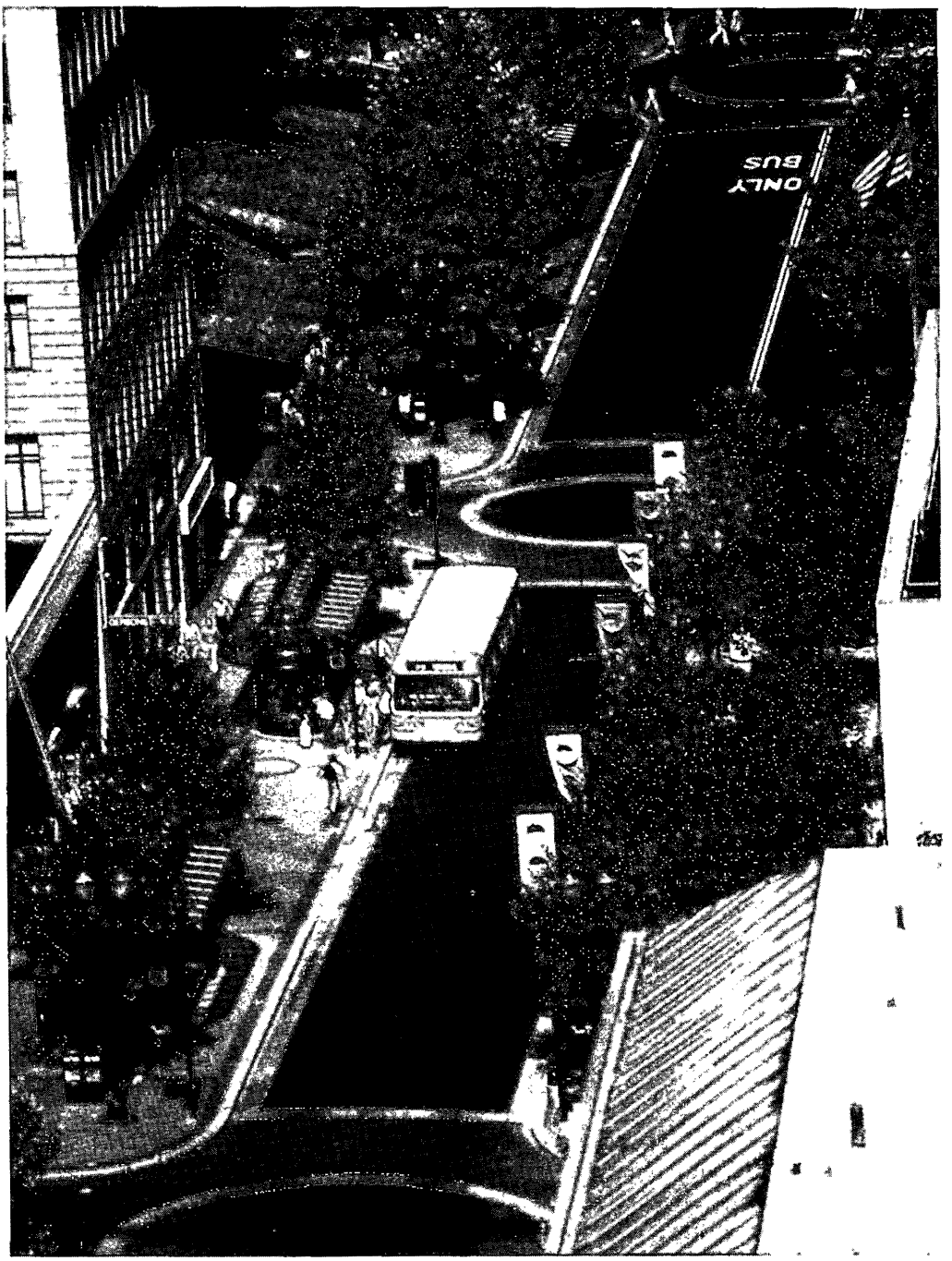

BUS
ONLY

Figure 4.2: *Transit Mall, looking north on 5th Avenue. Completed in 1978, the Mall was the major transportation improvement of the Downtown Plan, which called for combining high levels of transit service and high density office buildings in a North-South spine through the downtown (Photo: John V. A. F. Neal).*

the freeway loop and the goal of maintaining current traffic levels meant that the Harbor Drive expressway, built just after world War II, could be removed and replaced by a waterfront park. Finally, the parking policy discouraged surface parking lots, and therefore helped to end the destruction of buildings and eliminated "the gap-toothed look."

The Downtown Plan (adopted 1972), which was prepared while these transportation proposals were under study, developed a coherent vision of the downtown core (Figure 4.3). In many ways, the Plan's intent was to resuscitate and advance the 1920's downtown; that is, to make it a place of many activities, active at most hours, and the center of its region. The Plan was based on recognizing and encouraging individual specialty subdistricts, each with a strong character although with indistinct boundaries. The Downtown Plan aimed to maintain the scale and feeling of the older downtown. It called for keeping the existing 200-foot blocks and streets which provide a high proportion of open space, light, and air. It also urged that new buildings be built out to the sidewalks, preferably with street-level retail, in order to reproduce a sense of "enclosure" and high- levels of activity which make downtowns special. The primary subdistricts identified were a north-south spine of high density offices adjacent to the Transit Mall, and a retail district running east-west along the former street car lines near the middle of the office spine. At the intersection of these two districts, the Downtown Plan proposed a public square, replacing the parking lot at S. W. 6th and Morrison which was on the site of the former Portland Hotel. Around these two primary districts, the Plan proposed districts of lower density buildings. These included two historic districts adjacent to the waterfront preserving the remaining cast iron buildings, an apartment housing district west of the Park Blocks, and a medium density office area between the old downtown and the first urban renewal district (Figure 4.3).

PUBLIC DEVELOPMENT ACTIVITY

In the late 1970's the region decided to construct a light rail transit (LRT) line from downtown to the eastern suburbs. The decision was at least partially based on the success of the Transit Mall and the associated bus service expansion, which saw ridership double in less than five years. In the downtown, the line followed the east-west axis of the retail core serving as the distribution shuttle which the Downtown Plan had called for. It also used First Avenue as did the first horse cars to connect the two historic districts. Within these districts the street rebuilding required for the LRT was expanded to create two small plazas which provide foci for each district. This line, which opened in September 1986 in a "free rides" weekend with over 200,000 riders and much entertainment, was built to the same high standards as the Mall. A shortage of government funds, threatened the level of quality but downtown property owners provided funds as a local match to provide the "amenities" which were locally recognized as essential to project success.

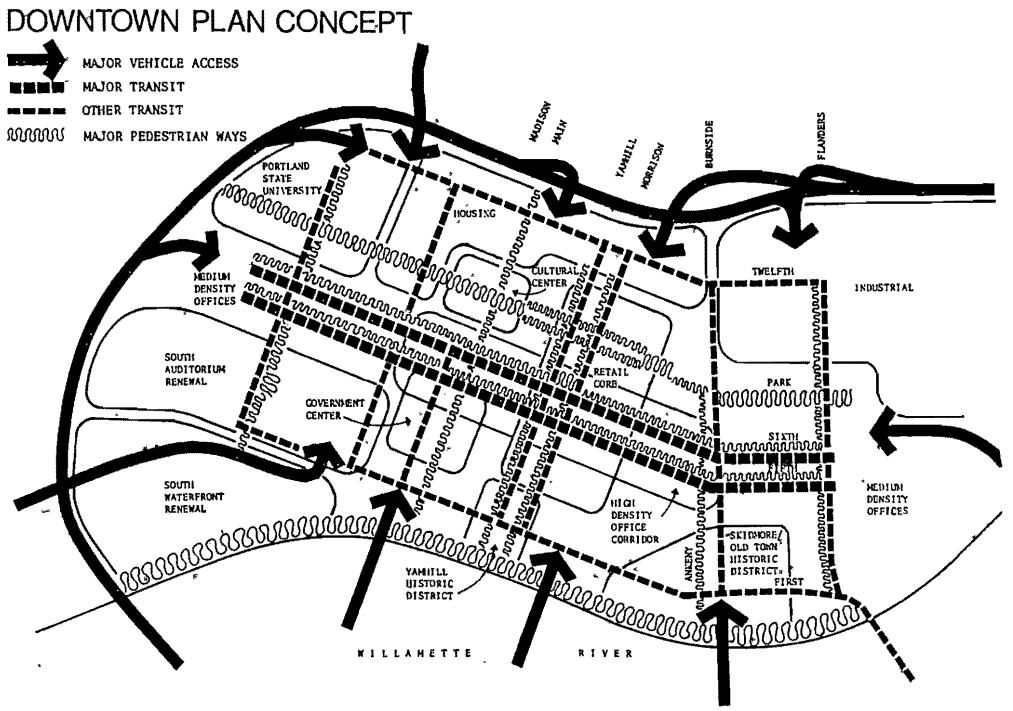
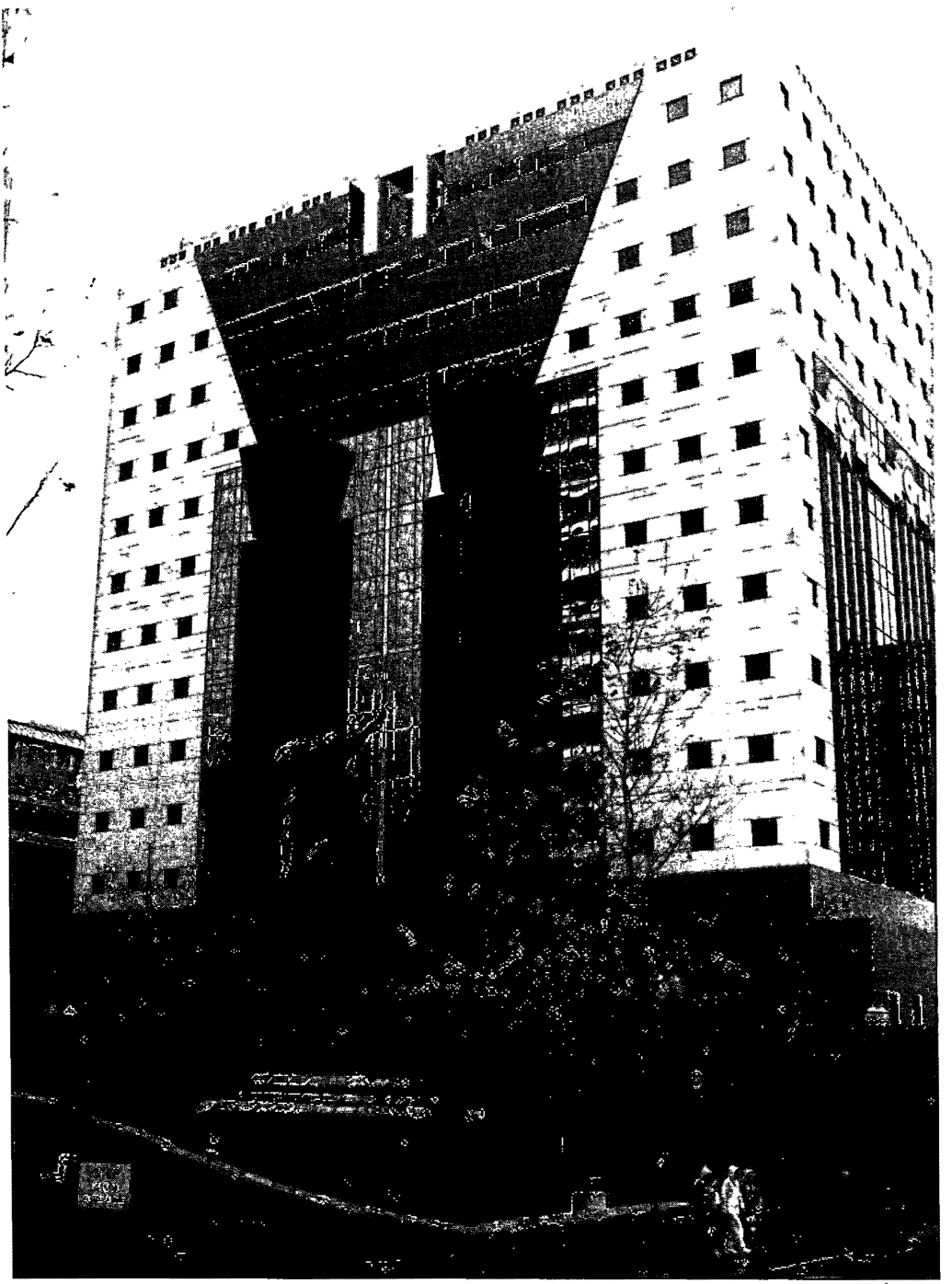


Figure 4.3: *Downtown Plan conceptual diagram (north is to the right). This concept illustration, which shows the freeways and major auto entry points in heavy black lines, guided most of the downtown development over the last 15 years. Other features of the concept were the transit routes (dashed lines), pedestrianways (squiggles) and the subdistricts (outlined with thin lines).*

The continued striving for coordinated and high quality transportation public works also led to increasing quality for public and private developments and to a changed attitude toward the role of public buildings. A significant method used by the City to achieve both its design and development objectives was the public design competition. These competitions were used to construct public facilities like Pioneer Square, a city office building and the Performing Arts Center. They were also used by the urban renewal agency for three projects which mixed private office, retail and housing developments on land assembled by the agency. Except for Pioneer Square and the Performing Arts Center, which were traditional architectural competitions, these were design/build competitions.

The most famous, or infamous of the competitions, was for the Portland Building (the city's own office building). What started out as a relatively ordinary-sized and relatively low-priced project became high drama when the lowest

Figure 4.4: *Portland Building, 5th Avenue side, with Portlandia statue at the third floor level. The statue, like the building, was the result of a national design competition. It is paid for by a "one percent for art" fund and many generous donations (Photo: John V. A. F. Neal).*



cost project was also the most radical. The chosen design, by Michael Graves, was the subject of much questioning, as it was the first large "Post Modern" building to be approved for construction (Figure 4.4). The debate over radical styles and the resulting national architectural press attention helped to place Portland on the architectural map, and called attention to the other recent works and the overall plan which created the support for these developments. While it is unlikely that the Portland Building, as it is called, will ever be considered ordinary, it has seemed to slide into its environment with less disharmony than the initial debate suggested. More recently, the addition of the "Portlandia" statue in hammered copper has called attention once again to the building -- and renewed the stream of local and out-of-town tourists who come downtown to see what's new (Figure 4.4). In fact, Portlandia's trip up the river and onto her platform was cause for a parade of boats and crowds along the entire route.

After this foray into national limelight, leadership turned toward local designers for public projects. However, the local architectural scene was much enlivened by the national attention, and the results were hardly less bold although generally more inchoate. The design of Pioneer Square had to accommodate many ideas. An open square respectful of the neighboring diminutive "pioneer" federal courthouse, it also had to provide for large public gatherings, two LRT stops and retailing within a single 200 foot block. The Square does serve all these functions, and provides an identifiable "center of town."

The development competitions of the urban renewal agency have generated controversy, but they have also produced high quality public environments. These competitions were for the small area redevelopment projects which replaced the large clearance urban renewal activities. Combined with an extensive program of historic and housing rehabilitation loans, and smaller public improvements, they have demonstrated that an urban renewal agency can achieve high quality results for a total environment without engaging in total clearance projects. The agency's first competition was for a three block office/housing project in the area between the old waterfront downtown and the first urban renewal project. The KOIN Center Tower, the only part yet constructed, includes lower-level retail, multiplex cinema and TV studios with offices and housing above (Figure 4.5). The tower itself represents a return to earlier architectural forms -- its stepped back shape and blue metal sloping roof recall New York's Chrysler Building, albeit reduced in size and with less decoration. The largest design/develop competition was for a downtown retail mall scheduled for construction in 1988. The primary public objective is to increase the total amount of retail downtown and to focus that retail on the upper end of the market. The Rouse Company, a developer of similar projects in other cities, was selected as the developer and retailers new to the Portland area have expressed an interest in being part of the project. Its central location near Pioneer Square and connecting the waterfront historic district with the retail core, make it a critical element in the Downtown Plan's overall retail strategy.

OFFICE DEVELOPMENT

The 1970's and early 1980's saw the construction of a number of office buildings. These included the First

Figure 4.5: *The new RiverPlace development extends Waterfront Park with a public marina and esplanade. Fronting the esplanade are shops, a small hotel, and apartments and condominiums. The skyline on right shows the peak-roofed KOIN tower and the Interstate Bank tower (Photo: John V. A. F. Neal).*

Interstate Tower, a tall bank tower which anchored the south end of the downtown office spine and served to connect that spine with the urban renewal area (Figure 4.5). It was also the first time a bank had moved out of the early 20th century "banking district" at the north end of downtown, and therefore contributed to the radical revision of "downtown" which the Downtown Plan projected. On the other hand, it was a large tower with an inhospitable plaza and no street-level activity, it conflicted with the on-street pedestrian emphasis of the Downtown Plan. Its striped black glass and white marble tower also seemed to many to have little reference to the "human scale" which was such a by-word of the Plan. Other, smaller towers had some of the same characteristics, but their lesser size and more traditional locations caused less comment. These towers were followed by others which were progressively more in keeping with the Plan's objectives and also more adventuresome in overall architectural form. A shifting national architectural scene pushed architects toward adventuresome forms, but the Downtown Plan and a public design review process helped to harness this shift in support of an overall vision of the city.

The most notable of recent towers is the U.S. Bank Tower (1983) which anchors the north end of the office spine and dared to place first class office space on Burnside Street -- the traditional "skid road." The Bank, which had originally planned its tower in the early 1970's, maintained the basic flat-topped box of the International Style, skewed to reflect the conflicting angles

of the two grids at Burnside Street. Its skin, however, is an almost playful combination of polished pink granite and pink glass that vary in reflectiveness and light/dark values depending upon weather conditions and time of day.

Paralleling the new office towers, which changed the physical form of the downtown, was the rehabilitation of many older office buildings. These, mostly terra cotta and light- colored brick buildings, formed the traditional heart of downtown and were the model for the design regulations of the Downtown Plan. In the period 1970 to 1985, almost five million square feet or 70 percent of the older office space was rehabilitated. The buildings near the Transit Mall were mainly rehabilitated for offices while a number of buildings away from the Mall were converted to housing for the elderly. Probably the finest example of these rehab projects was the Kress building, changed from an all retail structure, to two levels of retail with offices above. The new storefronts are recreations of the 1920's -- and probably of a higher quality than those originally built for the building.

The other significant remodelling trend was in the historic waterfront areas, where the cast iron loft buildings were restored to offices above retail buildings (Figure 4.6). This, of course, is a national trend common to many other American cities. Perhaps the only significant difference was the renewal agency's use of a revolving loan fund to encourage the rehabilitation throughout each historic district and the provision of other benefits to encourage the building of "infill" buildings on former surface parking lots. This effect is particularly noticeable in the Yamhill Historic District which 10 years ago seemed to be a small group of buildings in a sea of parking. Extensive rehabilitation, significant infill and a pedestrian plaza built as a light rail station, has transformed and focused the area (Figure 4.6).

As a result of the construction, remodelling and conversions of office buildings up to 1985, the downtown core contained 12 million square feet of office space, up from seven million square feet in 1970. At the same time, however, the downtown area has gone from 84 percent of the region's total office space in 1970 to 56 percent in 1985. These trends and percentages are not radically different than for other metropolitan areas, although perhaps the suburbanization of office space has been slower in Portland than in most other western cities.

RETAILING

Retail activity in the Downtown has changed substantially in the recent past. In the old retail core, the department stores engaged in an intensive period of remodelling during the 1970's (with one new store construction). Government action was also used to encourage retailing. To replace parking lost due to on-street parking removals, the city constructed two parking garages at the east and west edges of the retail district. Since they are intended to support retail activity, short-term parking is favored, and both have shops on the ground floor so that shoppers can stroll along continuous retail streets. More recently, the downturn in the Oregon economy and the increasing pressure of discount retail operations on the traditional department stores has resulted in two department store closures. In comparison with suburban shopping centers, the downtown has become more focused on the "upper end" retail market. The middle income market has generally disappeared as the downtown

Figure 4.6: *New Market Theatre Building with MAX light rail train on S. W. 1st Avenue in the Skidmore-Old Town Historic District. The New Market Theatre (high white facade) was originally built as a produce market with a grand theater on the second floor. For much of the 20th century a parking garage, it was recently restored as a shopping arcade with offices on the upper floors (Photo: John V. A. F. Neal).*

is unable to provide the sites desired by discount retailing operations. At the same time, "boutiques" or small retail shops have grown in number. The Galleria, a remodelled former department store (1975-76) was the first of these, responding to changing shopping habits. The recent development of "festival market places" in the two historic districts (Yamhill Marketplace, New Market Theatre, etc.) is designed to serve an almost recreational role -- and offer the same types of merchandise one finds in resort towns. Retailing success depends almost as much upon creating a special environment as it does on the merchandise offered. The historic districts, with their restored buildings, markets for hand-made products and access to the river and Waterfront Park, provide this special environment.

HOUSING

Housing in the downtown area has been the subject of substantial change, much of it publicly inspired if not financed. The number of units has not changed dramatically, dropping from 11,000 in 1970 to about 10,100 in 1983, but the character of the housing has changed. The City has encouraged housing at all income levels, with subsidies focused toward serving special housing markets. The elderly housing market has been served by the con-

struction of new apartment buildings as well as by the remodelling of older apartments, hotels, and office buildings to meet the special needs of the elderly. The public has also subsidized housing rehabilitation for those low income individuals needing the special services of single-room occupancy (SRO's) and/or skid road housing. Most of the housing for this group is located in or adjacent to Skidmore historic district, which has significant retailing. Public conflict has erupted over maintaining housing and social services in this area because of the "problem populations" which use them. Actually, the number of low-income housing units has declined substantially even with the subsidy programs.

New housing for middle- and upper-income residents has been the most successful to date. Initial efforts focused toward the construction of new housing on waterfront land abandoned by industrial activities at both the north and south ends of downtown. While this housing is relatively expensive, given the size of the units it does provide sufficient amenities, e.g., river views and easy access to downtown jobs and downtown attractions needed to attract the target markets. The urban renewal agency is currently subsidizing the construction of middle-income infill housing along the Park Blocks. With the opening of this housing the total number of units in the downtown area will return to 1970 levels.

Many of the recent buildings and happenings discussed above reinforce downtown's role as an entertainment place. This is not only in the old sense of Broadway's "Great White Way" -- but also as a change of environment -- a "getaway" just like a ski weekend or trip to the coast. The parks, waterfront, buildings and sculptures provide an environment not found elsewhere in the metropolitan area. The use of the light rail transit seems to support this conclusion, since weekend ridership is nearly as high as that of workdays. The Performing Arts Center (scheduled for completion in the fall of 1987) and the plans for a Convention Center and a relocated Oregon Museum of Science and Industry on the east side of the river across from downtown, will increase this entertainment or special purpose role for downtown. This "special activities" role, then, complements the downtown's more traditional role as a job center and in some ways augments its traditional roles as a center of retailing and higher density housing. Perhaps the most significant feature which the downtown has for fully exploiting this new entertainment role is the Willamette River. Planning and development activities over the last 15 years have lead the city back toward the river, but many additional opportunities are available. The river provided the original economic purpose for Portland's location. It is somehow appropriate that the city should again draw renewed purpose from the river.

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Chapter 5
The Everyday City: Portland's Changing Neighborhoods

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Americans like to keep tabs on the typical. Giant corporations search for average cities in which to run market tests for new brands of crunchos and fizzits. The targets tend to run to comfortable communities like Rochester, N.Y., Columbus, Ohio, or Des Moines, Iowa.

Political commentators also feel the impulse to characterize typical Americans. When political pundits Richard Scammon and Ben Wattenberg a few years back pronounced that the average voter was a 40-year-old housewife living in the suburbs of Dayton, Ohio, they were indulging in the national habit of carefully defining the middle American.

What about Portland and its neighborhoods? Does the city on the Willamette have its own equivalent of middle America - a community that offers average neighbors, average convenience, and average urban problems?

Data presented in the City of Portland's annual *Neighborhood Information Profiles* allow the definition of the most statistically typical of eight geographic districts within the city limits, each of which includes several neighborhoods (Figures 5.1, 5.2). The measures range from basic demographics (age, race) to economic status (education, household income) and patterns of every day life (transit use, residential stability). Totaling the absolute values of the deviations (ignoring plus and minus signs) gives a rough indication of the extent to which each district diverges from the middle (Table 5.1).

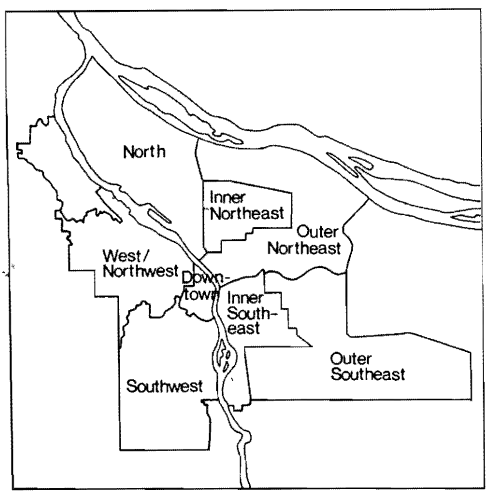

Figure 5.1 Portland's residential districts as defined for the city's Neighborhood Information Profiles of smaller neighborhoods (Portland Office Fiscal Administration, 1983).

It's no surprise that Downtown runs off the scale as a wildly atypical neighborhood. The west side also differs sharply from the city wide averages. Closest to the norm is Inner Southeast, followed by Outer Southeast (Table 5.1). Both districts are close to the average in every category. As a sort of "middle Portlandia", the southeast area has a life of its own at the same time that it is tied to the larger metropolis. Most of its workers find jobs within the city, but only one in ten

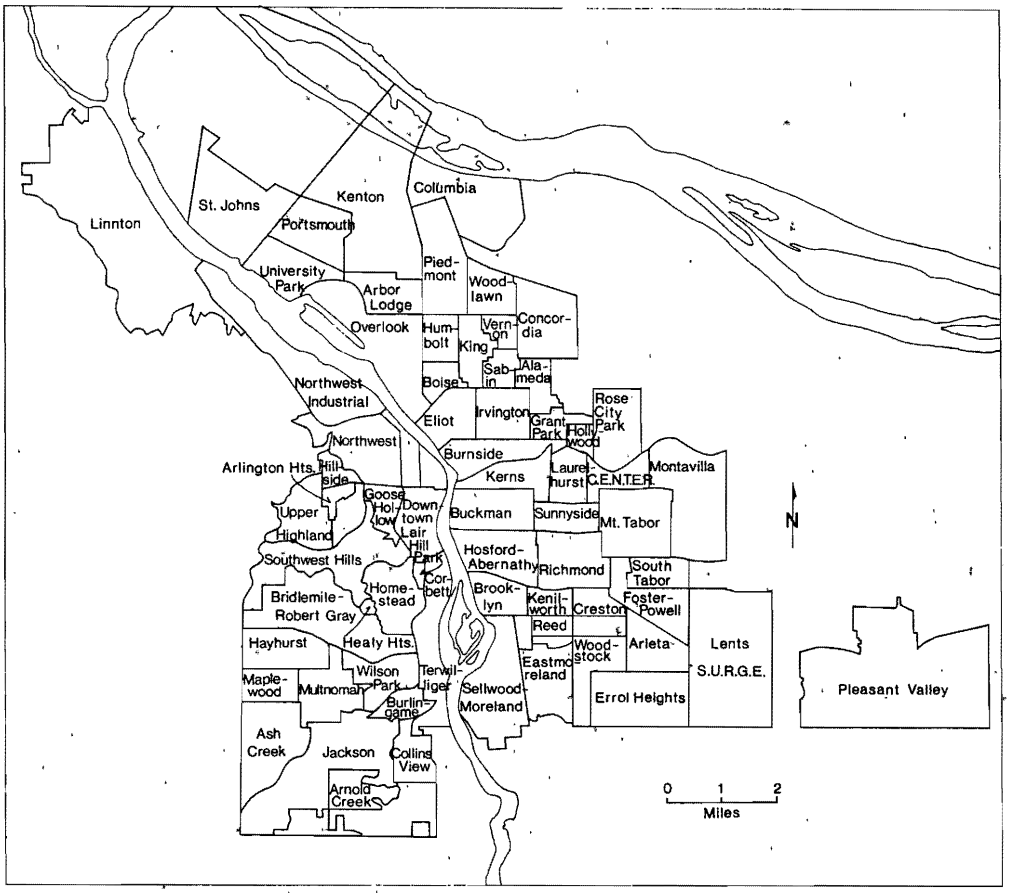

Figure 5.2 Portland neighborhood boundaries. The city recognizes neighborhood boundaries as defined by its independent neighborhood associations (adapted from Abbott, 1983, p. 190).

commute into downtown. Southeast Hawthorne Boulevard is a rapidly revitalizing business street that attracts customers citywide, but many southeast businesses serve local markets.

The same area is also the geographic center of population in metropolitan Portland. Although the exact spot shifts with every new subdivision on one side of the city or the other, it has been somewhere on the southeast side for the last 75 years. By the early 1980's, the center of population was somewhere in the eastern end of the Sunnyside neighborhood near Southeast Hawthorne Boulevard and 39th Avenue, 2 1/2 miles east and 1/2 mile south of the historic focal point of Portland's downtown at 5th and Morrison streets (Ferriday, 1984, pp. 13-15; Deleuw Cather, 1971).

In larger perspective, central southeast preserves something of the community life of the 1920's and 1930's with an overlay from the 1980's. Within a mile of the metropolitan population center we can find three theaters that still show clean movies (with Saturday matinees). The upper middle class

Table 5.1: *Portland neighborhood characteristics, percentage deviation from city average (Portland Office of Fiscal Administration, 1983)*

	North	Inner NE	Outer NE	West/ NW	SW	Inner SE	Outer SE	Down-town
Percent White	+2	-36	+7	+9	+12	+5	+9	–1
Percent College graduates	–59	–27	0	+45	+91	–9	–18	–5
Percent 60+ years	+5	–10	+15	+45	–20	+10	+5	+65
Median household income	0	–9	+14	–32	+43	–14	+12	–62
Percent Professional occupations	–42	–15	+23	+27	+50	–12	–15	+4
Percent Houses owner occupied	+17	+11	+28	–69	+21	–25	+17	–90
Percent Commuters by bus	0	–6	–31	+13	+6	–12	+13	+31
Years in neighborhood	–25	+2	+9	–14	–15	–8	–1	–41
Median value of houses	–20	–18	+8	+94	+42	–11	–1	NA
Rate of Major crimes	–9	+18	–20	+7	–55	–1	–29	+550
Total Deviation (Sum of Absolute values)	179	152	155	355	355	107	120	940

Laurelhurst neighborhood, built with gracious curves and symbolic entrance gates, shares the area with working class housing and with upgrading neighborhoods where young families are recycling bungalows and boxy four-square houses from the 1920's. One of the old transit shopping streets has gone yupscale with trendy restaurants and antique shops for weekend browsing. Another is dotted with Chinese, Vietnamese, and Filipino businesses. A third shows little change from the 1950's.

The neighborhood life and neighborhood patterns that we see in the southeast district and elsewhere in Portland are the combined product of the general processes of urban growth and of deliberate policy choices. Portland's neighborhoods have been shaped by the same economic, social and technological forces that have molded most other American cities. At the same time, its "natural" neighborhoods from the late nineteenth century and the first half of the twentieth have been reshaped by conscious choices, first to encourage the outward shift of population and then to conserve the existing urban fabric. The remainder of this essay explores the impacts and interaction of markets and politics by (1) sketching the evolution of Portland's neighborhoods over the last century (2) describing key patterns of social geography that have resulted and (3) analyzing the evolving goals and tools of

neighborhood policy.

The section of central Southeast Portland mentioned above includes examples of three of Portland's five basic neighborhood types. Over the decades, competition for space, view sites and prestige have created four irregular rings around the central business district. Portland's downtown, its stopover neighborhoods, its everyday neighborhoods, its highlands and its automobile suburbs are each differentiated by history, housing type, social function, and social status (Figure 5.3).

As in many other cities, the central business district is simultaneously Portland's oldest and newest neighborhood. It contains the contracted remnant of the skid road/lodging housing district that once stretched for a mile along the city's waterfront. With cheap lodgings, second hand stores, missions, saloons, brothels, and employment agencies, the district served the needs of a transient labor force of lumberjacks, farm workers, seamen, and railroad construction gangs who wintered over or passed through Portland. At its height in the early twentieth century, the district may have housed between 5,000-10,000 men, giving Portland proportionately one of the largest skid roads in the nation (Sawyer, 1984, pp. 493-99). The remnant now at the north end of

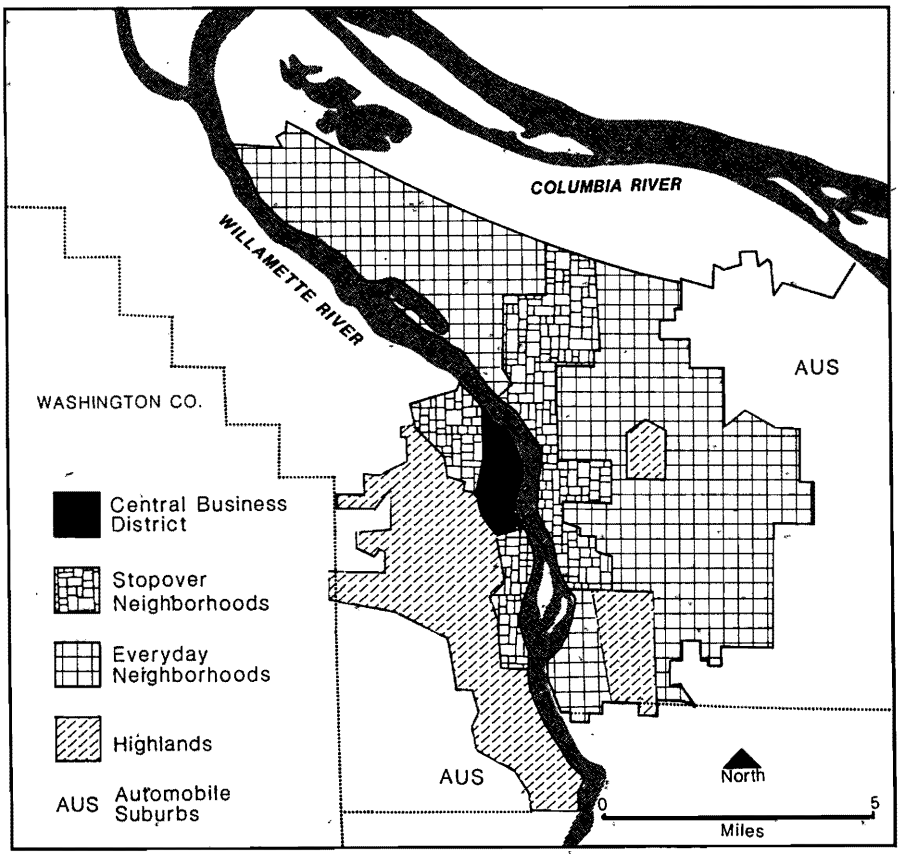

Figure 5.3 Portland neighborhood types (from Abbott, 1983, p. 24).

Figure 5.4 South Portland in the 1920's was a bustling "stopover neighborhood." This corner at S. W. First and Caruthers was obliterated by the construction of the inner loop I-405 (From Oregon Historical Society, Negative No. 47144).

the central business district meets the needs of a few hundred transients and another thousand or so residents of single room occupancy hotels. Elsewhere in downtown Portland, particularly on the southern and western edges, a new downtown community has begun to form with moderate and upper income housing for the elderly in new or converted buildings. In total, downtown houses approximately 10,000 people, divided roughly equally between low income and moderate/upper income.

Expansion of the central business district and its ancillary uses such as coliseum, freeway loop, and public university has destroyed significant portions of Portland's stopover neighborhoods. In the early years of the century, these were Portland's nearest equivalent to the large ethnic communities of New York or Chicago. The crescent of lower land around the central business district below the West Hills and the inner tier of east-side neighborhoods was largely settled by the early years of the century (Figure 5.4). With minor exceptions, these areas offered cheap housing for transient workers, European immigrants and their children, orientals, and a scattering of blacks. At the start of the Great Depression, these areas housed the overwhelming majority of Portland's foreign-born and its racial minorities (Figure 5.5). No single European ethnic group provided the majority of residents in any one neighborhood between 1910 and 1930. However, Jews and Italians set the tone for South Portland, Germans for Goose Hollow,

Slavs and Scandinavians for Northwest Portland, Scandinavians, Central Europeans, and German-Russians for the Albina-Union Avenue district, and Italians for Brooklyn for the Southern Pacific yards (MacColl, 1979, pp. 47-63).

Successful immigrants or their children did not settle permanently in the stopover neighborhoods. Newcomers used the cheap housing for a year or a decade to learn the rules of their new home and to land a decent job before finding a better house in a better neighborhood. Since the curtailment of European immigration in the 1920's, there have been few replacements for the Italians or Poles who moved on. The inner neighborhoods had Portland's highest density and almost all of its apartment buildings in 1930, but had already begun to lose population. One prominent real estate firm described the area as the city's "break-up zone" in which new land uses were destroying old residential patterns (Strong and McNaughton, 1924). Since 1950, large tracts of land in the old stopover neighborhoods have also been taken for I-5 and the I-405 freeways, for urban renewal, and for institutional, industrial, and commercial use. Nevertheless, stopover neighborhoods continue to house approximately 70,000 Portlanders (Figure 5.3).

Stopover neighborhoods have assumed the disproportionate burden of Portland's poverty because of their special use by newcomers to the city. During World War II, Harlan P. Douglass (1945, pp. 30-33) used seven measures of social status and real estate value to define social quality. South Portland and Albina ranked at the bottom of his list, with Northwest Portland and the inner southeast also below average. Analysis of 1960 census data showed a continued match between deteriorated housing and poverty in the same neighborhoods (Portland City Planning Commission, 1967, pp. 23-32). Another study in 1972 described a smaller area including lower Albina, Buckman, and downtown residential areas as the city's postwar slum zone, which fell further and further behind the rest of the city on standard social indicators (Columbia Regional Association of Governments, 1972).

Black population in the Portland area has grown from 2,000 in 1940 to 33,000 in the SMSA in 1980; most housing has been available in the stopover neighborhoods of the northeast side. There is no ghetto that approaches the nearly total racial isolation of South Side Chicago or Bedford-Stuyvesant, but 10,000 black Portlanders live in a compact corridor along Union and Williams avenues from Russell to Killingsworth, where more than 60 percent of their neighbors are also black. The degree of racial concentration in this core community has not changed since 1970. However, the suburban housing market is now at least partially open to black families. During the 1970's, black population rose from 400 to 800 in Clackamas County, and from 200 to 1,100 in Washington County, mostly in Beaverton. Another 1,800 black residents are scattered among the middle-class neighborhoods between 82nd Street and Gresham. For the metropolitan area as a whole, the number of census tracts in which blacks constituted one to five percent of the total population increased from 23 in 1970 to 59 in 1980.

Within the city, the center of Portland's black community has moved more than a mile north from N.E. Union and Broadway in 1940 to N.E. Union and Skidmore in 1980 (Portland City Planning Commission, 1936, plate

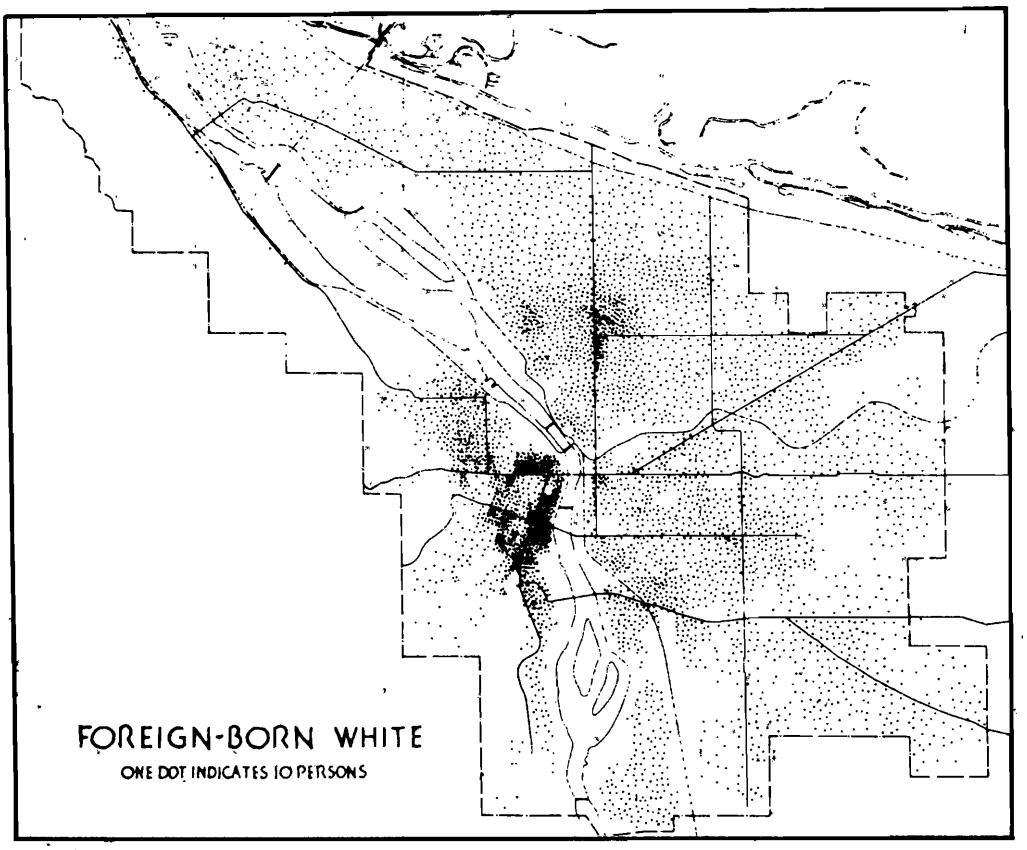

Figure 5.5 Foreign-born residents, 1930. European and Canadian immigrants clustered in low-rent neighborhoods north and south of the central business district and in northeast Portland (From Portland City Planning Commission, Report on Public Recreational Areas, 1936).

7). The process started with the land clearance for the Coliseum in the 1950's and continued with the construction of Interstate 5 in the 1960's and the Emanuel Hospital redevelopment in the 1970's in the historic heart of Albina south of Fremont and west of 18th Street. Housing rehabilitation programs in Irvington reversed an eastward movement of blacks south of Fremont, and whites in recent years have discovered the Eliot neighborhood as a target for recolonization (Figure 5.2). In contrast, analysis of census tract data shows that the Vernon-Concordia-Cully area north of Fremont and east of 15th Street saw the black population grow from 2,000 to 5,500 during the 1970's. At the same time, movement of black residents into Woodlawn, Piedmont, Kenton, Portsmouth, and other neighborhoods that lie north of Killingsworth and west of 15th Street has raised the black total from 3,800 to 6,500.

Portland's everyday east side neighborhoods have evolved gradually from streetcar suburbs (Figure 5.3). Between 1890 and 1920, land developers platted thousands of acres on the east

Figure 5.6 Everyday neighborhood: east Portland. Taken in 1944, this scene is typical of a score of east-side neighborhoods largely developed in the bungalow style of the 1910's and 1920's (From City of Portland Archives and Records Center).

side of the Willamette in the zone between 1 1/2 and 6 miles from the central business district (Snyder, 1979). St. Johns, University Park, Overlook, Piedmont, Concordia, Alameda, Irvington, Rose City Park, Montavilla, Mount Tabor, Richmond, Ladd's Addition, Woodstock, Sellwood, and Westmoreland were within a half hour trolley ride of downtown in 1930 and a half hour bus ride in 1980 (Bartholomew, 1932, plate 16). Buildings filled block after block in these neighborhoods in two great building booms of 1904-13 and 1922-28 (Figure 5.6) (Public Administration Service, 1959, p. 6; Portland *Daily Journal of Commerce*, June 7, 1929). Even Ladd's Addition - now a historic conservation district - was built largely in the 1910's and 1920's. Most of the remaining lots were used for new one-story houses to meet the needs of war workers and returning veterans in the 1940's.

The home typical of these streetcar neighborhoods is the Portland bungalow. Only a decade ago, this Northwestern version of a California housing style seemed old-fashioned. Now we have rediscovered the appeal of wide porches, overhanging roofs, exposed rafter ends, and unboxed eaves (Figure 5.6). Today's real-estate ads show that this "Old Portland" style is popular once again. We have also discovered that the bungalow's open floor plan is as livable in the 1980's as it was seventy-five years ago. The Rose City Park and Ladd's Addition neighborhoods provide particularly rich samplings of styles.

The highlands also date from the twenties, thirties, and forties, although there was also settlement in the 1910's (Figure 5.3). The high-status communities that provide homes for most of Portland's upper middle class and its upper crust are draped over the crest

of the West Hills from Willamette Heights and Arlington Heights on the north, through Portland Heights, Council Crest, Burlingame, and south beyond the city limits in Dunthorpe and Lake Oswego. The areas are a natural expansion of the Nob Hill and King's Hill neighborhoods that housed Portland's upper class at the turn of the century (Marlitt, 1978; Portland Historic Landmarks Commission, 1979). East of the river, the same groups occupied the slightly higher land of Alameda, Eastmoreland, and Laurelhurst (Figure 5.2). Overall site planning with curving streets, large middle-aged houses, mature trees, and the banishment of neighborhood cleaners and groceries make them residential enclaves that shelter residents from the outside world. From the start, the majority of West Hills householders expected to commute to work by automobile rather than trolley, although Eastmoreland and Laurelhurst did have streetcar connections. The clubby tone of the highlands is similar to that of Alamo Heights in San Antonio, the eastshore suburbs of Detroit, and the Country Club district of Kansas City — all twentieth-century neighborhoods whose social status has been protected by geography and tradition since the start of the automobile era.

The automobile suburbs built after 1945 occupy by far the largest portion of the metropolitan area. The suburban impulse has followed corridors of settlement that were defined by electric interurban railroads early in the century. Southern Pacific and Oregon Electric lines reached west to Beaverton and Tualatin, while the Portland Electric Company ran trains to Oregon City and Gresham. Use of automobiles in the 1930's accelerated the dispersal that reached massive proportions after World War II (Throop, 1948). On the east side of the Willamette, they ran roughly east from 92nd Street, which marked the approximate limit of streetcar and bus service before 1940, and south from the Multnomah-Clackamas County line. With minor exceptions, these areas lay outside the city of Portland. West of the river, the new housing after the war spilled down the far slope of the West Hills onto the rolling farmland of Washington County. Westside annexations by the city of Portland since 1950 have added typical suburban problems of substandard roads and overtaxed sewers to the worries of city officials. Across the political boundary of Washington County residents have complained for two decades about these growing pains while refusing to spend the money to deal with them.

Growth of this ring of one-story housing and shops has been dependent on aid from the federal government. The loan insurance and guarantee programs of the Federal Housing Administration and Veterans' Administration primed the huge building boom that added more than 300,000 housing units in the metropolitan area between 1950 and 1980. Federal grants for parks, planning, and especially sewers have made it economically feasible to build the new neighborhoods that thousands of Portlanders have preferred. Without this aid, growth in Washington and Multnomah counties would have been seriously slowed after 1970.

These basic types of Portland neighborhoods can be compared with well-known models of urban social geography developed by sociologist Ernest Burgess and his colleagues (Park, Burgess, and McKenzie, 1925) and by historian Zane Miller (1969) (Table 5.2). The Portland zones show a

Table 5.2: *Zonal models of American cities*

Chicago 1920 (Burgess 1925)	Cincinnati 1900 (Miller 1969)	Portland 1900-1980 (Abbott, 1983)
The Loop	The Circle	Central Business District
Zone in Transition		
Workingmen's Homes	Zone of Emergence	Stopover Neighborhoods
		Everyday City
Residential Zone		
	Hilltops	Highlands and Automobile Suburbs
Commuter Zone		

partial match with those defined by Burgess, who drew particularly on the growth patterns of Chicago. In part because of the intense demand for commercial and industrial land in Chicago in the early twentieth century, that model contains two zones that are essentially non-residential rather than the one business core zone for Portland. Miller's model of Cincinnati, a city roughly comparable in size to Portland, matches the Portland zones more closely. The Portland model defines four residential zones rather than two because it deals with a city in which automobiles have helped to create additional distinctions among residential areas, whereas Miller focused on the decades around the turn of the century. All three models define the sections of the city in terms of evolving social functions rather than demographic or socioeconomic variables at a point in time.

Portlanders themselves are much more likely to think in terms of a simple division of their city into east and west sides than to distinguish in detail among individual neighborhood types. By the 1930's and 1940's, the expense of residential construction on steep West Hills slopes in contrast to the largely level land east of the river had clearly established a socioeconomic differential. The vast quantities of land that new cars and new highways made available for urban development in the postwar decades allowed Portlanders to sort themselves further out by economic class and to confirm the Willamette River as a social barrier.

The growth of working class Portland induced by World War II had its most immediate impact on the east side. The bulk of wartime public housing was located in east-side neighborhoods and most of the city's new black residents settled in older housing just east of the river. With undeveloped and buildable land and easy access to centers of industrial employment, the east side absorbed much of the area's lower-income and middle-income housing between 1945 and 1960 as tract ranch homes in new neighborhoods filled the role played earlier by the ubiquitous bungalow (Portland City Planning Commission, 1965). Beyond the city limits, eastern Multnomah County showed the highest growth rate among

suburban counties, with a share of metropolitan area population that climbed from 9.9 percent in 1940 to 18.3 percent in 1960 before dropping in the sixties. The unincorporated section of Multnomah County in the 1950's and 1960's was in many ways a classic suburb. It counted a high percentage of workers who commuted to Portland and its percentage of residents who had moved from the central city was twice that of the other SMSA counties (according to census *Subject Reports* on *Mobility for Metropolitan Areas).*

As Multnomah County filled with subdivisions, the flow of new development shifted westward to Washington County in the 1960's, creating new suburban communities that took their social tone from the adjacent Portland neighborhoods. Although the county's share of total SMSA population rose only from 7.8 percent to 8.7 percent during the forties, it reached 19.7 percent by 1980. If Multnomah County's suburban communities have retained close ties to the central city, those in Washington County have been considerably more independent. Among the several suburban jurisdictions, it has had the highest proportion of residents arriving directly from outside the metropolitan area. With the exception of Clark County in Washington, where cross-river commuters were confined to a single bridge until the 1980's, Washington County also had the lowest percentage of workers who commuted to Portland and the highest percentage working in the county of residence.

The new communities that blossomed on the far slope of the West Hills took on something of the social tone of the adjacent highlands. Washington County in 1940 ranked below Clackamas County, Portland, and the remainder of Multnomah County on the standard socioeconomic indicators of education, income, and occupational mix. The county drew even with the rest of the metropolitan area by 1950, surged ahead in 1960, and widened its lead by 1980 (Abbott, 1980, pp. 89-91). The difference between the eastern and western halves of the metropolitan area is even more dramatic if the West Hills census tracts in western Portland and Multnomah County and the Clackamas County tracts west of the Willamette River are grouped as separate subareas. In 1960, 1970, and 1980, the median values for the tracts in each of these west-side areas far exceeded the values of the entire county of which they are a part (Table 5.3). The east side of the SMSA can claim several prestige neighborhoods that are known to eastsiders, but an address almost anywhere from Portland Heights west to Hillsboro and south to Wilsonville carries the cachet of respectability.

The east/west split simultaneously unifies and divides the metropolitan area. It overlies and mitigates the socioeconomic contrast between central city and suburbs and thereby prevents a degree of social polarization. At the same time, however, it deeply influences local politics, which have frequently been stated in terms of west side "haves" and east side "have-nots". In local imagery, as journalist Keith Moerer (1984) has pointed out, eastsiders characterize the west side as "rich, snooty, where the city's fat cats live and work, where status seekers begin their climbs". Westsiders, in turn, argue that the east side is poor, flat, dull, and dangerous. Indeed, there are more bowling alleys and RV dealers east of the Willamette, more stockbrokers on the west.

From the adoption of Portland's first

Table 5.3: *Socioeconomic status indicators, west side Portland SMSA. Educational attainment refers to median number of years completed for persons 25+ years, 1950-1970. For 1980 it shows percentage high school graduates, for persons 25+ years. Income for 1950-70 indicates median income for families and unrelated individuals. For 1980 it indicates median household income.*

	1950	1960	1970	1980
Percentage of Population in Professional and Managerial Jobs				
SMSA	8.5	8.9	9.9	11.5
Washington Co.	7.1	10.5	12.3	14.6
West Clackamas Co.	N.A.	14.2	15.0	17.2
West Multnomah Co.	14.2	14.8	17.2	19.6
Educational Attainment				
SMSA	11.4	12.0	12.4	78.5
Washington Co.	10.9	12.2	12.6	85.0
West Clackamas Co.	N.A.	12.6	13.0	90.6
West Multnomah Co.	N.A.	12.8	13.6	91.6
Income				
SMSA	$3,044	$5,356	$ 8,378	$18,423
Washington Co.	2,964	5,863	10,083	25,882
West Clackamas Co.	N.A.	6,920	11,184	27,954
West Multnomah Co.	N.A.	6,823	10,996	22,743

zoning ordinance in 1924 to the *Comprehensive Plan* of 1966, Portland had a consistent neighborhood policy -- to protect and enhance middle and upper income enclaves, and to divert the costs of growth to low income neighborhoods.

The guiding principles of the 1924 zoning code were simplicity and social segregation (Portland City Planning Commission, 1925; Abbott, 1983, pp. 87-90). The scheme divided Portland into four use zones. Areas restricted to single-family houses (Zone 1) covered 20 percent of the city land area. The zone that allowed duplexes and apartments (Zone 2) covered 45 percent of the city. Commercial as well as residential activities were allowed in 25 percent of the city (Zone 3). The unrestricted land in Zone 4 was intended primarily for industrial use. Well-organized and affluent neighborhoods like Mount Tabor, Laurelhurst, Eastmoreland, University Park, Alameda, Grant Park, Irvington, and Portland Heights received full Zone 1 protection under the new ordinance (Figure 5.2). Second-class Zone 2 status went to working-class neighborhoods with large numbers of rented houses. As in other cities in the 1920's, Portland's first system of zoning thus sanctioned and encouraged the existing division of land among economic functions and social classes. The use of only two residential zones and the uneven enforcement of a new housing code were intended to reinforce a distinction between newer and more spacious neighborhoods for the affluent and older, low-status neighborhoods with smaller houses and apartments.

A more complex neighborhood policy emerged in the 1950's that combined redevelopment, transportation, and

neighborhood unit planning (Abbott, 1983, pp. 186-190). Urban renewal and related projects targeted districts on the downtown fringe. The residential areas that hugged the lower land along the Willamette appeared to have outlived their role as staging areas for newcomers to the city (with the possible exception of the black community of northeast Portland). Given the consensus that blight "continues to get worse until clearance of an area may be the only feasible solution", the city accommodated demands for land for "central" uses through its redevelopment program (Portland City Planning Commission, 1967, p. 10). City agencies obliterated substantial parts of two neighborhoods in the late 1950's to make room for the Coliseum and for the South Auditorium renewal project. In the neighborhoods of inner Southeast and inner Southwest, the corollary was the replacement of single-family housing by cheap apartments to hold the land at an increased return until it was also needed for more intensive use.

The complementary strategy to writing off the inner ring as a residential area was the effort to hold middle-class population in the everyday neighborhoods and highlands by making them as suburban as possible. The planning commission and its staff applied the ideas about the preferred characteristics of a neighborhood unit that had been defined in the 1930's (Perry 1939). They hoped to retain low population densities, to block out nonresidential activities, to insulate neighborhoods from traffic, and to increase open space. The 1959 plan for the St. Johns district of North Portland summarized the principles of neighborhood design (Portland City Planning Commission, 1959, p. 55):

> *It is generally accepted that the 'neighborhood', an area inhabited by persons who are likely to have some common interests and activities, should not be broken up by major trafficways, should contain some local shopping facilities, and should have an elementary school and neighborhood park as a focal point for common activities at this level.*

The Planning Commission summarized its broad goal in its *Comprehensive Development Plan*, a city wide map of proposed land uses and public facilities prepared in 1958 and revised in 1966. The highlands needed little change, for the West Hills, Laurelhurst, and Eastmoreland were well-defined and well- maintained areas that could compete with upper status suburbs on their own terms. For southwest Portland, the Planning Commission helped to designate school locations that enhanced neighborhood identity. The proposals for the remaining eastside neighborhoods -- the everyday city -- were more drastic. The *Comprehensive Development Plan* suggested relocation of five schools in southeast Portland and fifteen schools in northeast and north Portland in order to reconstruct neighborhood patterns. It also called for 50 miles of new eastside freeways and expressways in addition to I-5 and I-205 in order to define neighborhood borders and to make the area appealing to auto-oriented Americans. In a summary written by Planning Director Lloyd Keefe and signed by Planning Commission president Harry Sroufe (1966, p. 13), the Commission's efforts were "directed toward restructuring our residential sections into secluded units protected from the encroachment of conflicting urban uses."

The changes that transformed neighborhood policy in Portland between 1967 and 1975 began with efforts by a score of largely self-defining neighborhood organizations (Abbott, 1983, pp. 190-206). Nearly every one of

the stopover neighborhoods and another half dozen of the everyday neighborhoods began to argue vigorously for its own version of revitalization in the later 1960's. Neighborhood associations themselves were not new, but the positive character of their agendas was a significant departure. By 1971 and 1972, active neighborhood associations and planning committees had established a presence that politicians and planning administrators could not ignore. Indeed, their critical mass required attention not as single problems or single neighborhoods but as a neighborhood movement.

The origins of this movement were different in every section of the city. Portlanders now tend to remember the group with which they were directly involved as the first to storm the barricades of the City Hall establishment. In fact, the process of neighborhood mobilization began on the east side with local efforts to influence federally assisted programs. Northeast Portland neighborhoods helped to plan and implement a Model Cities program that challenged kneejerk racism and dismayed many bureaucrats (West, 1969). Portland Action Committees Together, a local anti-poverty agency, helped organize half a dozen neighborhoods in southeast Portland to participate in community action programs. Southeast Uplift was a locally organized equivalent of Model Cities for the entire set of southeast neighborhood that had developed between 1900 and 1950 and that included several low-income communities.

The neighborhood movement gained its most articulate spokespersons among middle class "colonists" of the physically deteriorated neighborhoods of the west side, whose new residents united to fend off urban renewal bulldozers. The Northwest District Association formed in 1969 to deal with a proposed hospital expansion. It worked with the Planning Bureau from 1970 to 1972 to develop an alternative plan that would preserve Northwest as a high-density residential neighborhood of Victorian houses and 1920's apartments (Haldeman and Heiser, 1972). With a mix of the elderly, students, second generation immigrants, and younger professionals, it is Portland's most cosmopolitan neighborhood.

The Hill Park Association organized in 1970 to fight the possible clearance of the Lair Hill neighborhood, located just south of the downtown urban renewal zone (Uris, 1971). After the John's Landing development for converting abandoned industrial land along the west bank of the Willamette into office, trendy shops, and riverside condos was unveiled in 1971, the Corbett, Terwilliger, and Lair Hill neighborhoods joined in the development of their own district plan to preserve old working class neighborhoods for a new generation (Corbett-Terwilliger-Lair Hill Planning Committee, 1974).

The cooperative effort between the Planning Commission and the Northwest District Association was the catalyst for giving neighborhood groups a formal role in city decisions. City Council established the Office of Neighborhood Associations (ONA) in 1974 to assist local organizations through central and district offices. Neighborhood associations must be open in membership and record minority as well as majority opinions. In return, the ONA facilitates local activity. "Neighborhood needs reports" introduce neighborhood shopping lists into the city budget process. The Planning Bureau notifies neighborhood associations of zoning change requests and

has worked with individual communities on district plans and downzoning proposals to preserve residential environments.

The changes extended even to the definition of neighborhoods themselves. Neighborhood associations in the 1970's largely ignored the carefully defined neighborhood units of the *Comprehensive Development Plan* when they set their own boundaries. The neighborhoods on the 1966 map are compact and tidy units that float between arterial streets like the bubbles in a carpenter's level. The map of neighborhood association boundaries maintained by ONA is an untidy hodgepodge (Figure 5.2). Several associations claim overlapping territories. Other sections of the city have no active association. The size of neighborhoods varies substantially. Neighborhoods sandwich major traffic streets and commercial nodes that constitute natural centers of activity. Only half of the neighborhood associations carry names from the 1966 map. Especially on the east side, where neighborhood identities were set in the 1920's, the same name was applied to substantially different areas by planners in the 1960's and by residents in the 1970's.

Neighborhood conservation has been supported since the 1970's by central policy decisions as well as grassroots action. One of the key decisions of the early 1970's was the cancellation of the Mount Hood Freeway, a five-mile connection that would have displaced 1,700 households in southeast Portland (Abbott, 1983, pp. 255-57). As well as preventing the destruction of half a dozen neighborhoods, the decision was coupled with a shift to a balanced transportation system involving improved bus service and a rapid transit line. Ladd's Addition, one of the neighborhoods saved from the Mount Hood Freeway, became one of the city's first historic conservation districts in 1977 (along with the Lair Hill neighborhood just south of downtown).

Portland also targeted the new Housing and Community Development (HCD) program of 1974 to neighborhood assistance. Since the HCD area included approximately 140,000 residents, it was possible to use federal funds for a general housing rehabilitation program. About half of Portland's HCD money during the second half of the 1970's went to housing rehabilitation, in contrast to 10 percent in a comparable city like Seattle. The program helped to account for more than 7,000 home rehabilitation grants and loans. Louis Scherzer, a savings and loan executive who chaired the Portland Development Commission, commented in 1977 that Mayor Neil Goldschmidt had "gotten some of these archaic local lenders to turn around. These are high risk neighborhoods we're going into through the Public Interest Lender program, but he convinced us, got a staff together that knows rehabilitation . . . The basic thing is keeping these neighborhoods attractive. The gut issue is the little guy who takes out a loan for a paint job or a new furnace. It has a tremendous ripple effect throughout the neighborhood" (*The Oregonian*, December 18, 1977).

Many of the forces at work in Portland during the last twenty years have been the product of national trends. Portlanders were not responsible for the rise of a neighborhood participation movement or the inflation of housing prices that made old neighborhoods relative attractive. At the same time, Portland has provided a receptive environment for the conservation and reuse of everyday neighborhoods. It stands as a

virtual textbook example in which the changes can be clearly traced and defined. Portland is a city with distinguishable neighborhood types arrayed in identifiable crescents around the downtown. It is therefore easy to analyze the ways in which planning for neighborhood change or stability allocated the impacts of growth among different parts of the metropolitan area. With the help of the policy choices of the last two decades, Portland made a conscious decision for neighborhood conservation. We are, in the 1980's, as much a city of neighborhoods as we were in the 1920's.

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Chapter 6
Shaping and Managing Portland's Metropolitan Development

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Modern cities share a number of common spatial problems arising from the dynamics of their development. Dean Rugg in a perceptive book on urbanism has listed a number of such geographic challenges to cities. Among these are:

- Organizing political space, especially in metropolitan areas where small size and fragmentation are evident.
- Forming a stable relationship with the physical environment.
- Establishing a consistent land use and growth policy.
- Preserving the central city in the face of suburban expansion.
- Coping with intraurban transportation problems.

--(Rugg, 1979, p.4)

The Portland metropolitan region can be said to have confronted these problems in a number of imaginative ways. It has established a clearly delimited urban growth boundary, a metropolitan service district, a regional transportation commission, and a local government boundary commission. Through these institutions as well as other bodies and cooperative agreements, it has simplified a very complex pattern of local governments, created an area-wide comprehensive planning process, and taken a regional approach to provision of urban services that has preserved the primacy of the central city and fostered access to it.

THE CHARACTER OF THE PORTLAND METROPOLITAN REGION

The chartered City of Portland occupies less than a third of the territory and has barely a third of the population of the built-up and integrated urban agglomeration that can be called the Portland metropolitan region. In contrast to European cities which tend to be "overbounded" with substantial rural lands within city boundaries for potential urban growth, American cities are "underbounded," with areas of urban housing and facilities extending outward from the central city's limits for many miles in all directions.

The outer zone of suburban development in Portland began to emerge at the end of the 19th century with the establishment of streetcar lines and later spread with vigor in the automobile-oriented period following World War II. The building of freeways and other highway improvements made it possible to live long distances from work and from cultural and recreational facilities. Jobs and facilities also began to move out from the central city. In addition to the attractiveness of outlying areas for living, households and enterprises found that land costs were very much less, as were restrictions affecting building costs.

The result was the transformation of American cities, including Portland, from compact, coherent, centrally focused

entities into diffuse urban agglomerations that are multi-nodal, multi-connected social systems (Berry, 1967). The outer reaches of such systems are indeterminate mixtures of urban and rural elements, not unlike the frontier zones between countries in the premodern world with their intermixtures of cultural influences and their internal dynamic momentums (Kristof, 1959, 269 ff.).

The underbounding of American cities has been a principal factor in the urban challenges listed in the Introduction. Underbounding has also had other kinds of impacts. Thus, Portlanders have an image of their city as a modest place of some 366,000 persons, based on the 1980 Census Bureau count of population posted on signs marking the city limits. They would be more impressed if they were sensitive to another, more geographically realistic compilation by the Census Bureau -- the "urbanized area." Using a complex formula based on more or less contiguous urban development, the Bureau recorded 1,026,144 persons living in the Portland urbanized area of 347 square miles in 1980. Even this figure misses at least 100,000 additional commuters to Portland from outlying settlements that are essentially bedroom communities.

The suburban sprawl of Portland and other cities has not generally been seen as a desirable urban form, despite the apparent wide-spread life satisfaction of persons living within the zone. Among specific criticisms of sprawl are the high costs of providing urban-type services to scattered clusters of houses, the potential public health problems from reliance upon wells and septic tanks, and the underutilization of land as urban-based investors leave acreage idle to minimize their property taxes. The increase of the value of rural land by speculative bidding, moreover, tends to make farming unprofitable for farmers seeking to continue a traditional way of life. The break-up of large tracts of forest and agricultural land by suburban housing clusters is also seen as a threat to wildlife and a sense of rural community (Scofield, 1963, 64 ff.).

THE URBAN GROWTH BOUNDARY: REDUCING A FRONTIER ZONE TO A LINE

Concern about the consequences of unbridled urban encroachment upon rural areas was a principal motivation for the creation of the Oregon State Land Conservation and Development Commission (LCDC) by Oregon's state legislature in 1973. This body established a set of goals and objectives for land use management in the state. These included a requirement that each of the 36 counties establish a comprehensive land use plan based upon state-wide guidelines. Border-to-border land use planning was finally achieved in May, 1986 when Grant County in the eastern part of the state had its plan approved by the LCDC.

The LCDC guidelines included a requirement that outer territorial limits be designated for the growth of cities. Such an approach had never before been tried in the United States. The establishment of an "Urban Growth Boundary" (UGB) was based on objectives of (1) reducing urban sprawl; (2) providing a degree of choice in the land market; (3) efficiently providing public facilities and services; and (4) preserving future urban land for efficient development at a later date (Metropolitan Service District, undated).

Responsibility for determining the Portland metropolitan region's urban growth boundary was assigned to the existing Metropolitan Service District.

It adopted a boundary in November 1979, based on work carried out by its predecessor agency, the Columbia Region Association of Governments. Opposition to the concept was immediate and strong. Ultimately it prevailed in the courts, and a UGB was adopted in 1984 (Figure 6.1). The Urban Growth Boundary in effect reduced Portland's broad fringing zone to a sharp line of discontinuity, just as shell-like international boundaries replaced interactive frontier regions in 18th and 19th century Europe (Kristof, 1959).

THE FRAGMENTATION OF GOVERNMENTS

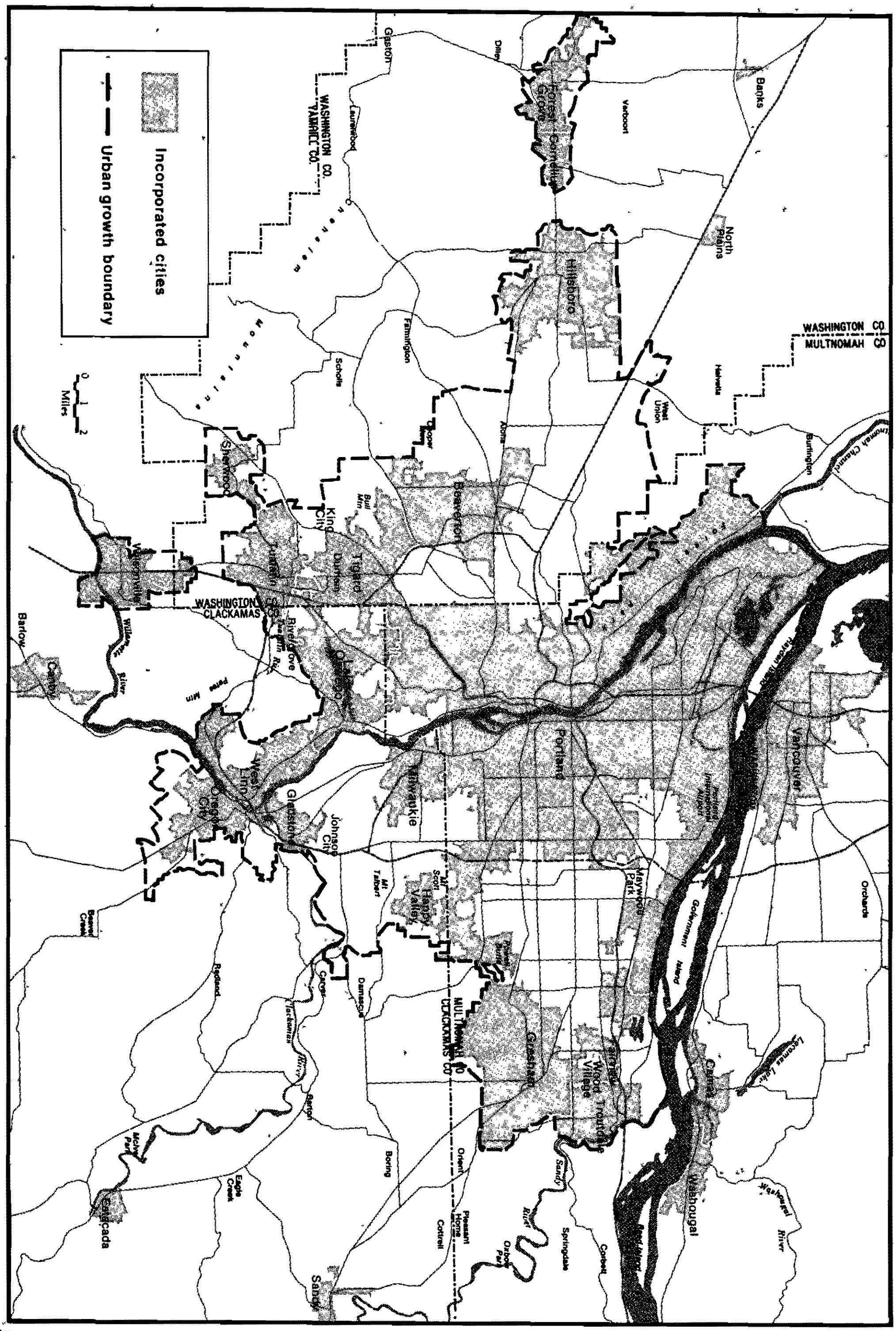
As noted above, the chartered City of Portland constitutes only a fraction of the area and population within the metropolitan UGB. Inside of the boundary the numerous housing subdivisions, industrial parks, shopping centers, and other urban settlements are provided services by a multiplicity of jurisdictions of incorporated cities and so-called "special districts" to fulfill single-purpose governmental functions. Moreover, the metropolitan region is fragmented among two states and at least four counties, a legacy of the mid-nineteenth century when the Oregon country was partitioned into smaller, more convenient areas for local governance.

As one of its initial acts the provisional government of Oregon in 1843 divided the settled areas south of the Columbia into four "districts": Champoick (later Marion), Clackamas, Twality (renamed Washington in 1849), and Yamhill. Rivers were used as conveniently described boundaries for these administrative units. The term "county" legally replaced "district" in 1845, when three new units were established in Oregon Territory: Clark County north of the Columbia, Clatsop south of the mouth of the Columbia, and Polk in the mid-Willamette Valley. Multnomah County was carved out in 1854 from the Columbia River frontage of Clackamas County and the Willamette River frontage of Washington County (Roberts, 1985, pp. 318-334).

The new Multnomah county had less than 1,500 residents. The fast-growing city of Portland was designated its seat, and its location on the west bank of the Willamette led to abandonment of that river in favor of the crest of the Tualatin Mountains as the western boundary of the county. These empty and difficult-to-cross "West Hills," as they are now universally termed by Portlanders, were certainly a much more appropriate local government divide. Contrary to popular perceptions, rivers are among the least desirable bases for boundaries. They have always been easier to cross by boat and by bridge than have hills or mountains by roads and rails. As will be detailed below, one of the Portland metropolitan region's greatest problems of planning and development derives from the decision in 1853 to separate the new Washington Territory from Oregon using the Columbia River as a boundary. Southwestern Washington State, from Vancouver to Centralia to the Pacific, remains much more tributary to Portland than to Seattle, yet cannot easily be coordinated in any planning and development of the Portland metropolitan region as a whole.

The establishment of Oregon counties was in keeping with the general process of American local government formation

Figure 6.1: Incorporated cities and the urban growth boundary (UGB) of the Portland metropolitan region.


Incorporated cities
Urban growth boundary
Miles
WASHINGTON CO.
MULTNOMAH CO.
CLACKAMAS CO.
Forest Grove
Hillsboro
Beaverton
Tigard
Portland
Vancouver
Gresham
Milwaukie
Gladstone
Oregon City
West Linn
Lake Oswego
Tualatin
Sherwood
Wilsonville
Happy Valley
Troutdale
Wood Village
Washougal
Camas
Banks
North Plains
Estacada
Sandy

in the 19th century. Outer limits were most often based on considerations of half-day travel by horseback to county seats. There was little to indicate the coming massive urban transformations of the 20th century. Unfortunately, by the time such transformations did occur, counties had assumed a degree of permanence that frustrated any attempts at consolidation or other reform.

Although the West Hills were breached by a corduroy log road early in the history of Portland, they constituted an operational and psychological barrier to urban expansion westward into Washington County well into the 20th century. For the first half of its history Portland was identified solely with Multnomah County. By the time transportation improvements had led to an expansion of Portland-tied settlements across the West Hills into Washington County and southward into Clackamas County, a host of institutions and other bodies had evolved whose cumulative effect was to reinforce existing county identities and to resist change in them.

Not the least of these were officials and employees of county governments who saw their positions threatened by change in the status quo. They provided successful opposition to expansion efforts by chartered cities as well as to any possible county mergers. Such resistance also appeared when modification of boundaries was proposed. As recently as 1964, the town of Cascade Locks was unsuccessful in its attempt to transfer itself from Hood River County to Multnomah County.

Like the present counties, the several cities in the Portland metropolitan region are also primarily the legacy of settlement patterns and transportation conditions of the mid-19th century. Portland had emerged in the 1850's as the winner among several rivals for the role of central city in the future Columbia-Willamette metropolitan region. Although Fort Vancouver had been operating for more than three decades before Portland was platted, it could not match Portland's dynamic growth. Also failing to keep pace was another rival, Oregon City, a thriving community harnessing the falls of the Willamette at the head of maritime navigation. Just downstream was Milwaukie, whose good harbor and fewer navigation hazards could also well have given it primacy over Portland, but did not.

Both Oregon City and Milwaukie benefitted from being near the terminus of the easiest passage for grain wagons from the Tualatin Valley to reach the Columbia-Willamette waterway. Their advantage was lost to the younger settlement of Portland, however, when merchants there built the corduroy road across the West Hills which substantially reduced travel time.

The 19th century saw the emergence of several additional urban settlements in the region. Some were associated with wood processing and other industrial development along the Willamette, including East Portland, Albina, Sellwood, St. Johns, and Linnton. As their populations grew and their economic and other linkages with Portland increased, they were merged with the burgeoning city through annexations that were then a matter of discretionary law-making by the state legislature. More distant from the Willamette River, other towns emerged to serve growing farm populations. These include Gresham, Sandy, and Troutdale in Multnomah county and Beaverton, Hillsboro, and Forest Grove in Washington County (see map frontis).

The City of Portland had been able to annex desirable contiguous urbanizing

areas rather easily during the 19th century through its political influence in the state legislature. Its success ended abruptly in 1906, however, when the legislature granted "home rule" to incorporated cities. Among other effects, this legislation required a citizen vote on any proposed annexations. Over the following half century most communities on Portland's fringe voted to create or maintain their own separate units of government rather than be absorbed by the central city (City Club of Portland 1986).

In more recent times the number of incorporated cities in the Portland metropolitan region has grown through the establishment of several urban entities to meet specific local problems and to benefit from laws requiring the state to share alcohol tax and certain other revenues with incorporated cities. Thus Maywood Park on the northeastern fringe of Portland was created in 1969 in a vain attempt to thwart a projected by-pass freeway through its hitherto unincorporated housing area. The City of Durham was established by its residents to resist a major truck assembly plant proposed for an open site in the vicinity of this Washington County settlement. State revenues were a motivation for the creation of Johnson City in 1966 in the area of a mobile home park in the southeastern borderlands of Portland. Happy Valley was incorporated in Clackamas County to thwart commercial development and protect the community's exclusively residential character (City Club of Portland, 1968).

As housing developments mushroomed in unincorporated areas after World War II, the new suburbanites as often as not remained outside of any incorporated areas, however. Their needs for urban services such as water supply, sewage, and fire protection were met generally by the establishment of ad hoc special districts. By the mid-1960's more than 300 special districts had been created in the Portland metropolitan region.

PROBLEMS RESULTING FROM THE MULTITUDE OF GOVERNANCE AREAS

Because of heavy dependence upon property taxes, cities and counties in Oregon have vied with each other to attract new development within their boundaries. This has led to charges that local governments were weakening their construction standards and offering other costly inducements for private developers to build new housing and shopping centers within their jurisdictions and thus increase their property tax returns. Cities and counties also found themselves in competition for limited federal and state funds for improvements in roads, sewers, and water supplies.

Frictions among the several counties and cities have hampered efficiency and good government in many ways. Their separate police forces, fire departments, and other administrative bodies have long run into problems due to jurisdictions that terminate abruptly at city limits or county lines.

For county areas outside of incorporated cities, urban-type growth was accompanied by a proliferation of special districts for water, sewage, street lighting, schools, fire protection, and even parks and recreation. Seldom did the boundaries of functionally different districts coincide, leading to a complex network of combinations of districts for the assessment of taxes, which was a county government responsibility. Although counties collected and transmitted special district taxes, they had no other supervisory or coordinating role. Indeed,

even at the state level there was no such role, other than the requirement for districts to file annual financial reports with the Secretary of State.

The small size of these districts often meant substantial underutilization of basic staff. For the metropolitan region as a whole there was unnecessary duplication of personnel and facilities for delivering services. Lack of coordination led to many problems. More than once a county road crew completed the repaving of a street, only to find the new asphalt torn up the next month by excavations of the local sewer or water district.

RESOLVING PROBLEMS ENGENDERED BY GOVERNMENTAL FRAGMENTATION

The negative consequences of the multitude of governments in the Portland metropolitan region have long been evident. The consolidation of the City of Portland with Multnomah County has several times been proposed as a remedy. However, in 1919, 1927, and 1974 electorates failed to approve ballot proposals for such consolidation. Although city/county consolidation has failed at the polls, several other remedies to Portland's local government fragmentation have been successfully instituted. These include creation by state or local authorities of: (A) The Port of Portland, (B) County Service Districts, (C) The Metropolitan Planning Commission, (D) The Portland-Vancouver Metropolitan Transportation Study, (E) The Columbia Region Association of Governments, (F) The Metropolitan Service District, (G) The Tri-County Metropolitan Transportation District, and (H) the Local Government Boundary Commission.

A. The Port of Portland

A successful attempt to meet a pressing metropolitan-wide need occurred in 1891 when the state legislature created the Port of Portland, with a taxation district embracing all of Multnomah County. Its assigned task was to dredge the Willamette and Columbia rivers and to maintain a navigable channel to the Pacific Ocean. The Port's responsibilities and area base have been expanded over the years. It came to develop and operate ship repair yards, industrial parks, and airports (see Chapter 10). In 1970 the separately managed public docks of the City of Portland were put under the Port's authority. In 1974, in recognition of the growth of the urban region, the Port district's territory was expanded to include Clackamas and Washington counties.

B. County Service Districts

Problems associated with the proliferating number of special districts on Portland's urban fringe were addressed by the state legislature in 1955. An interim committee was ordered to investigate the provision of urban services in unincorporated areas. Out of the committee's findings emerged legislation that permitted counties to create special county service districts to take over the activities of several single function special districts and develop zoning and other services. While this legislation brought greater order to the provision of services for urbanizing fringe regions and reduced special districts in the Portland metropolitan region nearly by half, it added substantially to the tasks and costs of county governments -- particularly to Multnomah County, where the bulk of urban growth had been occurring. It also had the counterproductive effect of stimulating growth in the fringe zone without effective planning guidance.

C. The Metropolitan Planning Commission

The need for some type of area-wide comprehensive planning process was well appreciated by local officials and planners, who banded together in 1957 to form a voluntary Metropolitan Planning Commission composed of one office-holder from each county plus the City of Portland. Not only did the Commission's efforts bring some order into the region's haphazard growth, but they also provided a persuasive unified vehicle for garnering increasingly available federal funds for planning and developing improved public services for urban communities. Although Clark County and the City of Vancouver participated in the Commission's activities, they were precluded by Washington law from contributing financially to the program.

D. The Portland-Vancouver Metropolitan Transportation Study

The metropolitan region's mutual transportation problems were specifically addressed two years later with the creation of the Portland-Vancouver Metropolitan Transportation Study (PVMTS). This body had representatives from Multnomah, Washington, Clackamas, and Clark counties and their cities, plus the Port of Portland and other agencies of each state. The PVMTS was a response to a federal requirement that requests from local governments in metropolitan areas for federal highway and mass transit funds must be approved by an area-wide planning body. It took inventory of the region's traffic characteristics and problems, and evaluated proposals for improvement.

E. The Columbia Region Association of Governments

Subsequently, Congress required similar local coordination of requests for federal funds for sewers, water systems, urban renewal, housing, and other improvements. Councils of Government (COG's) embracing entire metropolitan regions were established by local governments to meet this obligation. Portland's COG was the Columbia Region Association of Governments (CRAG), which was instituted in 1966 using the personnel, facilities, and research accomplishments of the Metropolitan Planning Commission. CRAG's governing body and activities also involved Clark County, Washington.

The Metropolitan Planning Commission had taken inventory of the region's development and had given perspective on the area's problems in land use and transportation. Its voluntary nature, however, had meant it lacked authority to actually impact the planning of the region except by moral persuasion and the threat of negative appraisal of applications for federal funds. Its successor, CRAG, had greater authority to encourage sound regional development, particularly because federal guidelines required CRAG's endorsement of funding of water and sewer systems. The PVMTS played a like role in evaluating local and state initiatives for road and highway improvements. Both agencies had only limited teeth to encourage cooperation between governments and to implement the area-wide plans they prepared, however.

F. The Metropolitan Service District

Despite the establishment of CRAG and PVMTS, the isolation of the region's multitude of governments from each

other and the frictions among them continued to present problems for coordinated development. In the 1960's a Metropolitan Study Commission created by the Oregon State Legislature had recommended that a Metropolitan Service District (MSD) be established by the legislature with authority to assume responsibility for providing region-wide services. The local League of Women Voters had earlier proposed such a service district (League of Women Voters, 1960). The study commission also recommended the creation of a Metropolitan Boundary Commission to pass on annexations, new special districts, and other local government changes in the region.

A Metropolitan Service District with a wide range of powers eventually was created by the legislature in 1979 and approved by a popular referendum. It was the first such area-wide organization in the United States to have an elected council and executive director. Metro took over the functions and personnel of CRAG and was given expanded authority to offer metropolitan-wide services, with police powers and the right to levy property and income taxes as well as to issue bonds.

In addition to its role in administering the Urban Growth Boundary, Metro (as the new agency came to be termed) has three other principal functions: (1) it continues the transportation planning activities of CRAG, including approval of local government requests for federal highway funds; (2) it is responsible for the disposal of solid wastes; and (3) it manages the 60-acre Washington Park Zoo, which was acquired from the City of Portland. It also is empowered to provide the area it serves with water supply, trunk sewers, libraries, exhibition facilities, public transportation, jails, sports arenas, and parks. However, it has not been strong enough politically or financially to take over these activities from the existing local governments. Metro has, however, recently accepted responsibility to construct and operate a new Convention Center approved by voters in the metropolitan region.

G. The Tri-County Metropolitan Transit District

Another area-wide organization is the Tri-County Metropolitan Transit District (Tri-Met), which was established in 1969 to replace failing bus companies in Portland and its Oregon suburbs. It has forged a unified transportation network throughout the three county area and has planned and constructed MAX, a new electric light rail line connecting downtown Portland with the eastern suburb of Gresham. Although Washington state laws and regulations preclude inclusion of the urbanized area of Vancouver and suburbs within the transportation district, Tri-Met has created what appears to be a satisfactory working relationship with C-TRAN, the public transportation authority for Clark County.

H. The Local Government Boundary Commission

Governance of the Portland metropolitan region has been simplified not only by the assumption of area-wide functions by special regional agencies, but also by a significant reduction in the number of special district governments, particularly through the activities of the Portland Metropolitan Area Local Government Boundary Commission. This body was one of three created in metropolitan areas of the state in 1969 to control and improve the structure of local governments by an impartial review of proposed creations of units or changes of existing boundaries. The Salem area commission has

since been abolished, but those of the Portland and Eugene regions continue to operate. The original Portland area commission embraced Columbia County in addition to the metropolitan counties of Multnomah, Washington, and Clackamas. In 1979, however, Columbia County was deleted from commission jurisdiction because of its predominantly rural character.

The Boundary Commission has authority over all cities in the three counties and over most special districts except school districts. Supervised districts include governmental units established to provide water supply, sewerage, park and recreation facilities, street lighting, vector control, and rural fire protection. Commission review is required for each of the following actions involving local governments:

1. Incorporation, dissolution, merger, or consolidation of cities or of special districts.
2. Adding a function to a special district.
3. Annexations to or withdrawals from cities or special districts.
4. Transfers of territory between cities or special districts.
5. Establishing or expanding privately-owned community water and sewerage systems.
6. Extension of water or sewer lines by cities and special districts to areas outside of their boundaries (Portland . . . Boundary, 1982, p.6).

In reaching decisions the Commission is guided by legislative mandate to prevent illogical boundary extensions, to assure adequate services while maintaining the financial integrity of units, and to make certain that any new units or boundary changes are consistent with local comprehensive plans and state-wide planning goals.

The Boundary Commission has been responsible for substantial reductions in the numbers of special districts under its jurisdiction, although many districts have been consolidated by local actions. Thus, Washington County created a Unified Sewerage District out of 23 former special sewer districts in its urbanized eastern section.

The successful contributions of the Boundary Commission towards halting the increase of local governments and ultimately in reducing their numbers is directly related to the Commission's ability to control the provision of water and sewerage services. By being able to deny the unwarranted expansion of essential urban facilities, the Commission plays a major role in implementing the area's comprehensive plans, particularly the maintenance of urban growth boundaries.

COOPERATIVE LOCAL GOVERNMENT AGREEMENTS

In addition to the several area-wide agencies that have been formed to provide and/or coordinate urban services, the problems of governmental fragmentation have also been ameliorated by a number of agreements among local units themselves. The creation of the Metropolitan Planning Commission is one such manifestation. A particularly noteworthy intergovernmental action has been a recent agreement between Multnomah County and the cities of Portland, Gresham, and Troutdale for joint construction of a new sewer system in east Multnomah county. This region of predominantly glaciofluvial gravels has long held the dubious distinction of being the single largest unsewered urbanized area in the United States.

Multnomah County has recently contributed to simplification of governance in Portland's suburbs by deciding sharply

to reduce its provision of services to unincorporated communities. Prompted by financial pressures, it announced in early 1983 that it would reduce to minimal rural levels its police protection, planning, parks and recreation, and other activities. In effect it terminated the county service district that had itself been created to reduce the tangle of special districts on the urban fringe.

Residents affected by the change in county policy were encouraged to meet their service needs by annexation to an existing incorporated city. Portland and Gresham have both developed aggressive annexation campaigns that have resulted in substantial growth of territories and populations. However, a court challenge to the methods used in annexation has placed a substantial part of recent annexations in doubt.

In reaction to Multnomah County's withdrawal from providing urban services and to the pressures for joining an incorporated city, a movement evolved in 1980 in mid-Multnomah County to create a new city of Columbia Ridge through annexation of unincorporated areas to the minuscule city of Wood Village. Its purpose was clearly to maintain the region's admittedly minimal existing urban service levels instead of becoming a part of a more comprehensive urban government with proportionately increased taxes. The high costs to convert a cesspool and septic tank system to sewers to meet the urban standards of Portland or Gresham was a matter of particular concern to local residents. The new city proposal was denied by the Boundary Commission on the grounds that the projected new entity would be unable financially to mount an adequate range of urban services.

AGENDAS FOR THE FUTURE

The territorial and demographic growth of the Portland metropolitan area has been accompanied by a haphazard evolution of governance units. The inherent conflicts, redundancies and inefficiencies of the area's numerous cities, counties, and special districts have been recognized and addressed by a concerned citizenry and legislature, as well as by the local governments themselves. Their efforts have led to a more smoothly working system of governance. Nevertheless, much remains to be done to provide an efficient and equitable government system.

Of particular concern is the provision of needed new or revamped area-wide services. Thus, the metropolitan region clearly needs a modern sports stadium. The existing one is old, small, and lacking in parking facilities. Owned and operated at a loss by the City of Portland -- like the Center for the Performing Arts, the Auditorium, and the Coliseum -- the present stadium represents yet another instance of subsidy by the citizens of the City of Portland to an institution utilized and enjoyed by residents throughout the metropolitan region. One solution to relieve an increasingly unfair burden on Portland taxpayers is to follow the precedent of the Portland Zoo, and transfer responsibilities for maintenance and expansion of region-wide public facilities to the Metropolitan Service District. In fact, a November, 1986, favorable vote to build a convention center to be operated by the service district is an encouraging development in this direction. However, Metro itself lacks sufficient political and financial support to take on many new responsibilities at this time.

In March, 1986, the City Club of Portland addressed the problem of governmental fragmentation by recommending a merger of the three principal Oregon counties into a super county (City Club of Portland, 1986). The proposal would

retain the pattern of cities to provide public services that are local in character. However, it would subordinate Metro, Tri-Met, and the Boundary Commission to the new regional county so that officials elected from throughout the area could establish priorities and guidelines for the provision of regional services. It was not deemed useful to place the Port of Portland under the new merged county government. The club's recommendation has yet to be endorsed or actively pursued by political figures or citizen advocates in the region.

The establishment of the urban growth boundary and the various institutions and agreements for planning and providing urban services in the Portland region fall short of addressing the total metropolitan problem because they are all limited to the Oregon side of the Columbia River. There is as yet no interstate compact to permit a mutually beneficial coordination of planning and management of services of Clark County and Vancouver with the Oregon portion of the metropolitan region. Short of that, some additional voluntary efforts could be forged comparable to the more-or-less successful CRAG organization and the agreement between the Tri-Met transportation district and Clark County's C-Tran.

The ill-founded decision to use the Columbia River to separate Oregon from Washington territory (rather than placing the boundary through the empty mountainous zone to the north of the river) has left an uncomfortable legacy to the present metropolitan region. Fort Vancouver was certainly more easily accessible in the mid-19th century to the settlements along the lower Willamette than were the area's agricultural lands, which almost entirely lay west of Portland's West Hills; similarly, present-day Vancouver via the Interstate 5 and 205 bridges over the Columbia is more easily reached from downtown Portland than is Hillsboro to the west or Gresham to the east.

The principal problem of area integration is not one of accessibility or even of administrative authority. It is rather a territorial discontinuity in what might be termed the "economic climate" of taxation systems. The State of Oregon derives its revenues primarily from an income tax, and local government units are heavily dependent on property taxes. State and local governments in Washington, on the other hand, operate primarily with funds from sales taxes.

The result is that it is less costly to maintain homes and enterprises on the Washington side of the river and it is cheaper to purchase goods on the Oregon side. Consequently, Clark County in recent times has had a disproportional share of residential and industrial development within the metropolitan region, particularly since the completion of a second freeway bridge across the Columbia that permitted easier access to the rest of the metropolitan region. Many employees and executives of firms in Oregon have increasingly found it desirable to maintain homes on the Washington side. At the same time, Hayden Island, just across from Vancouver on the non-sales tax Oregon side of the Columbia, has one of the area's highest volume supermarkets and one of its most successful shopping centers. Both states lose a significant amount of revenue as a result of individuals manipulating the contrasting systems of taxation.

The Columbia River boundary also precludes taking an area-wide approach to solving the principal remaining regional problems of air pollution control and solid waste disposal. This boundary

has perpetuated the same types of duplicated efforts and rivalries that until recently plagued the many jurisdictions within the Portland Urban Growth Boundary. Thus, the separate state-created port authorities for Portland and Vancouver have engendered unnecessary competition for present and potential industrial customers that reduces their revenues and probably harms the position of the region in contesting with its rivals elsewhere on the Pacific Coast.

While these and other problems resulting from fragmentation of local governments remain, the Portland metropolitan region nevertheless can take pride in the establishment of a series of innovative institutions and cooperative endeavors that have significantly reduced numerous ill effects associated with urban underbounding and sprawl.

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Chapter 7
Changing Residence in a Changing City

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Portland is similar in many ways to other American metropolitan areas of similar size. It is crisscrossed by freeways built during the 1960's and 1970's and dotted by suburban shopping centers and office parks. Recent housing developments have been mainly around the periphery although there has been considerable recent housing development in the central city areas. Portland, like many west coast cities, is a relatively new city so that pre 1900 buildings are generally considered to be historically significant. Older housing was mainly built in the 1920 - 1940 period. After World War II population has expanded around the historical central city into what were surrounding rural areas transforming the countryside and rural service centers.

In 1986 the incorporated Central City of Portland included about thirty percent of the population of the four county metropolitan area (Figure 7.1 and Table 7.1). Suburban cities in the surrounding metropolitan area contain significantly more population in aggregate than Portland, the central city. Gresham, Lake Oswego, Oregon City, Beaverton, and Hillsboro were significant centers of commerce, industry, and housing in their own right prior to the development of fast highways linking them to the central city. Today they contain shopping facilities meeting most needs of the residents and providing considerable employment opportunities in retailing, services, office employment, and manufacturing.

Portland has demonstrated many demographic trends which are similar to those in other similar size metropolitan areas. Some that will be described in this chapter are the geographic impacts of declining birthrates, the passage of the post-World War II baby boom population through various types of housing habitat, and the effects of high interest rates upon housing choice during the 1970's. Although Portland's experience is similar to that of other cities the geographic impacts of these phenomena are often highly concentrated in certain areas of the region.

One feature of Portland which is unique is the perception of the liveability of the city and it's surrounding region (See Chapter 13). To better understand the popularity of this city we will examine the migration linkages between Portland and the rest of the United States during recent decades. A second view of residential quality issues will be provided by examining the reasons that Portland residents have provided for moving between the City and it's suburbs and between various neighborhoods in the city.

Another feature of Portland which is of special interest is the application of rigorous laws, many enacted during the 1970's, impacting land use in Oregon. Suburban growth has been contained to some degree and channelized. The

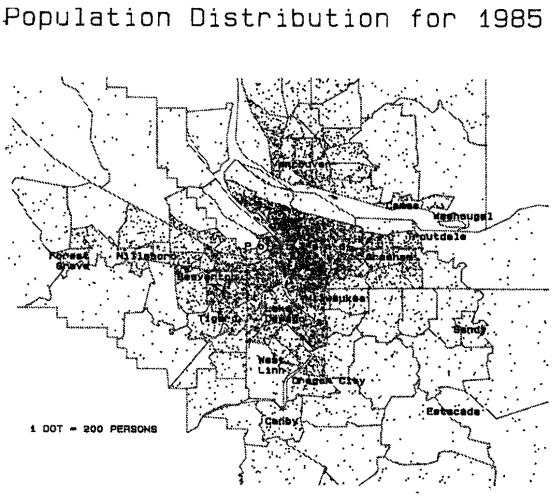


Figure 7.1: Population distribution for the Portland metropolitan area for 1985 (Base map from Metropolitan Service District; data from Metropolitan Service District, 1985; Oregon Center for Population Research, 1985).

changing distribution of population will be examined as will forecasts of future population for the metropolitan area. The unifying theme is the interrelationship between population distribution, residential choice, and housing and employment opportunities.

DEMOGRAPHIC LINKAGES TO OTHER PLACES

One way to understand the nature of a place is to know how it is related to other places. Measures used by geographers to illuminate the nature of places include the geographic patterns of trade flows, daily commutation to work, and vehicle movements. The following section examines migration of population between the Portland metropolitan area and other portions of the United States. The source of these data is the U.S. Decennial Censuses of Population and Housing for 1960, 1970, and 1980 and will be for persons who moved across county boundaries during the five year periods preceding the Censuses (U.S. Bureau of the Census, 1961, 1972, 1982). Demographers usually make a distinction between moves that occur within counties and moves between different counties. For moves within counties people are usually moving for various personal or housing related reasons while the longer moves usually involve relocation to a new labor market area.

The total numbers of persons shown by the Census to have moved between counties in Oregon and between Oregon and other states of the United States was approximately 271,000 for the 1975-80 period (Table 7.2). The actual number of movers was somewhat greater since some persons may have moved to Oregon from another state, say Ohio, and moved back during the five year period. The 1975 to 1980 period was one of rapid population growth for the Pacific Northwest, generally, and for Portland in particular (Morrill, 1981).

Table 7.1. *Population of incorporated cities (U.S. Census Bureau, 1962, 1972, 1982; state of Oregon, 1985, and state of Washington, 1985)*

Area	1960	1965	1970	1975	1980	1985
Clackamas County						
Barlow	86	98	105	110	105	100
Canby	2,168	2,901	3,813	5,675	7,680	7,750
Estacada	957	1,002	1,164	1,620	1,500	1,735
Gladstone	6,237	1,002	3,854	8,120	9,575	9,750
Happy Valley	-	-	-	1,435	1,495	1,465
Johnson City	-	-	-	400	375	390
Lake Oswego	8,906	1,220	14,561	19,400	22,630	2,420
Milwaukie	9,099	1,420	16,379	18,030	17,930	17,375
Mollala	1,501	1,599	2,005	2,760	3,020	3,100
Oregon City	7,996	8,300	9,176	12,460	14,730	1,450
River Grove	-	-	-	320	320	310
Sandy	1,147	1,350	1,544	2,060	2,960	3,530
West Linn	3,933	4,600	7,091	8,860	11,440	12,950
Wilsonville	-	-	-	1,230	3,035	3,700
Unincorporated	71,028	110,508	106,396	120,420	146,205	182,175
County total	113,058	134,000	166,088	202,900	243,000	248,200
Multnomah County						
Fairview	578	759	1,045	1,405	1,745	1,850
Gresham	3,944	5,400	12,378	21,000	33,230	37,480
Maywood Park	-	-	-	1,065	845	825
Portland	372,476	382,000	382,619	375,000	370,000	379,000
Troutdale	522	600	575	2,500	5,990	6,890
Wood Village	822	900	1,533	2,605	2,290	2,595
Unincorporated	144,471	165,341	158,517	144,325	148,200	133,160
County total	522,813	555,000	556,667	547,900	562,300	561,800
Washington County						
Banks	347	411	430	440	495	495
Beaverton	5,937	11,400	18,577	22,150	32,080	33,950
Cornelius	1,146	1,377	1,903	2,660	4,550	5,050
Durham	-	-	410	330	705	720
Forest Grove	5,628	6,550	8,275	10,200	1,160	11,750
Gaston	320	320	429	452	470	560
Hillsboro	8,232	11,000	14,675	19,160	28,000	30,520
King City	-	-	1,427	1,980	1,855	1,830
North Plains	-	-	-	820	720	930
Sherwood	680	772	1,396	1,750	2,400	2,685
Tigard	-	2,203	5,302	10,075	14,900	19,960
Tualatin	359	380	750	3,241	7,700	10,350
Unincorporated	69,588	87,587	104,346	117,642	152,765	149,200
County total	92,237	122,000	157,920	190,900	247,800	268,000
Clark County (Washington)						
Battleground	888	1,126	1,438	2,116	2,774	3,256
Camas	5,666	6,050	5,790	5,990	5,681	5,560
La Center	244	258	300	420	439	380
Ridgefield	823	956	1,004	1,039	1,062	1,110
Vancouver	33,103	38,000	42,788	46,500	42,834	42,760
Yacolt	375	600	488	545	544	545
Washougal	2,672	3,250	3,388	3,500	3,834	4,150
Unincorporated	50,038	64,760	73,258	88,890	135,059	145,639
County total	93,809	115,000	128,454	149,000	192,227	203,400

Table 7.2. *Migration between Portland and other regions of the United States (U.S. Bureau of the Census, 1980 Census of Population and Housing. Data summarized from public use sample).*

Origin or Destination	In Migration To:				Out Migration From:				Net Migration For:			
	Clack.	Mult.	Wash.	SMSA	Clack.	Mult.	Wash.	SMSA	Clack.	Mult.	Wash.	SMSA
Northeast	1,372	4,980	2,551	8,903	527	2,231	407	3,165	845	2,749	2,144	5,738
East N. Cent.	1,961	4,442	3,086	9,489	436	2,087	705	3,228	1,525	2,355	2,381	6,261
West N. Cent.	1,161	3,700	2,109	6,970	567	2,083	542	3,192	594	1,617	1,567	3,778
S. Atl. & S.E.	1,094	3,643	1,945	6,682	448	3,058	814	4,320	646	585	1,131	2,362
West S. Cent.	398	2,565	1,673	4,636	407	2,134	628	3,169	-9	431	1,045	1,467
Mtn. N.	973	2,576	1,750	5,299	737	2,789	941	4,467	236	-213	809	832
Mtn. S.	1,430	4,768	2,928	9,126	1,176	3,828	1,431	6,435	254	940	1,497	2,691
Aka. & Ha.	641	1,991	820	3,452	345	1,642	388	2,375	296	349	432	1,077
Total California	7,646	14,373	11,229	33,248	2,327	9,666	2,971	14,964	5,319	4,707	8,258	18,284
Los Angeles	2,293	3,750	2,927	8,970	416	2,387	587	3,390	1,877	1,363	2,340	5,580
Sacramento	357	768	577	1,702	392	116	479	987	-35	652	98	715
San Diego	527	1,483	749	2,759	281	1,147	341	1,769	246	336	408	990
San Francisco	1,968	5,387	3,918	11,273	793	3,175	1,275	5,243	1,175	2,212	2,643	6,030
Subtotal	5,145	11,388	8,171	24,704	1,882	6,825	2,682	11,389	3,263	4,563	5,489	13,315
Rem. Cal.	2,501	2,985	3,058	8,544	445	2,841	289	3,575	2,056	144	2,769	4,969
Total Washington	2,968	10,074	4,810	17,852	3,180	17,041	3,941	24,162	-212	-6,967	869	-6,310
Seattle	989	2,794	1,481	5,264	868	4,429	1,535	6,832	121	-1,635	-54	-1,568
Spokane	281	981	453	1,715	127	715	258	1,100	154	266	195	615
Tacoma	216	1,205	485	1,906	202	1,180	359	1,741	14	25	126	165
Vancouver	716	2,079	730	3,525	685	6,493	926	8,104	31	-4,414	-196	-4,579
Subtotal	2,202	7,059	3,149	12,410	1,882	12,817	3,078	17,777	320	-5,758	71	-5,367
Rem. Wash.	766	3,015	1,661	5,442	1,298	4,224	863	6,385	-532	-1,209	798	-943
Total Oregon	32,387	33,434	31,253	97,074	20,156	57,301	18,695	96,152	12,231	-23,867	12,558	922
Clackamas	N/A	9,086	3,298	12,384	N/A	20,583	3,397	23,980	N/A	-11,497	-99	-11,596
Multnomah	20,583	N/A	23,366	43,949	9,086	N/A	6,943	16,029	11,497	N/A	16,423	27,920
Washington	3,397	6,943	N/A	10,340	3,298	23,366	N/A	26,664	99	-16,423	N/A	-16,324
Subtotal	23,980	16,029	26,664	66,673	12,384	43,949	10,340	66,673	11,596	-27,920	16,324	N/A
Rem. Ore.	8,407	17,405	4,589	30,401	7,772	13,352	8,355	29,479	635	4,053	-3,766	922

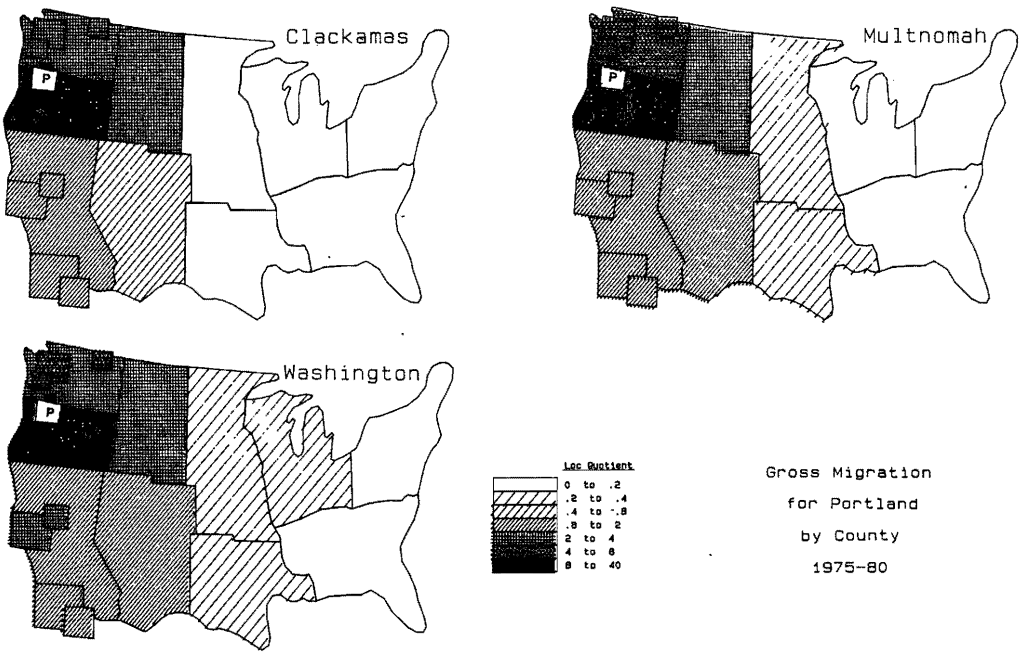


Figure 7.2: Gross migration between Portland and other U.S. regions for 1975 - 1980. Gross migration consists of total numbers of migrants moving between Portland and each other region of the U.S. Values shown are normalized as location quotients based on population of the U.S. regions. Values greater than 1.00 indicate higher levels of interaction. Values less than 1.00 indicate lower levels of interaction *U.S. Census of Population: 1980*, special tabulations of the Public Use Micro Sample, 1983).

Nearly 36,000 more persons moved to the three Oregon counties in the metropolitan area during the 1975-80 period than moved away (Table 7.2). However, Multnomah County, including mainly the central city of Portland, lost approximately 18,000 persons through outmigration while suburban Clackamas and Washington counties gained a total of 54,000 persons, including about 20,000 from Multnomah County (Table 7.2).

Gross migration is greater between Portland and nearby areas than with distant ones (Figure 7.2). For example, the movers between California and Oregon are more numerous compared to California's population than is the case with the Northeast or Southeast regions of the U.S. However, the regional exchange of population for the three metropolitan counties shows patterns of considerable diversity (Figure 7.2). If one expresses gross migration as a ratio of total migration then more rural Clackamas County has lower gross migration to and from distant regions than does more urban Multnomah County and industrially expanding Washington County (Figure 7.2).

For some regions net migration to or

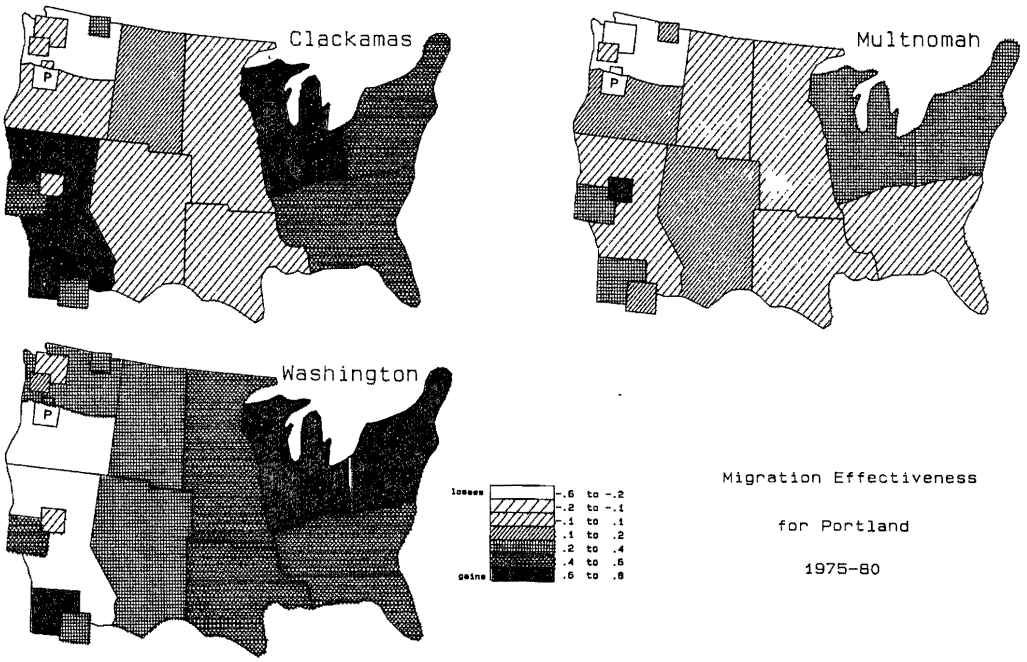


Figure 7.3: Effectiveness for migration between Portland and other U.S. regions for 1975- 80. Migration effectiveness consists of the ratio of net migration to gross migration. Large values indicate that the net shift of population by migration is large compared to the total number of movers. Positive values indicate areas from which Portland gained population. Negative values indicate areas to which Portland lost population *U.S. Census of Population: 1980*, special tabulations of the Public Use Micro Sample, 1983).

from Portland is quite large compared to the total numbers of movers. During the 1975-80 period migration was especially effective in shifting population from California and the East to Portland (Figure 7.3). Moves between Portland and the Rocky Mountain region and other areas of Oregon, while numerous, did not result in much net shift of population (Figure 7.3). Growth in Washington County resulted in effective migration from most areas of nearby Washington State, but generally more urban Multnomah County lost population to areas in Washington state.

Prior to the 1975-80 period different migration linkages prevailed between Portland and other regions. The cartogram for the 1955-60 period shows Portland losing considerable population through migration to California and the Southwest as well as to the Seattle- Tacoma region (Figure 7.4). During this same period Portland gained large numbers of persons from a northern tier of states extending from the Rocky Mountains to the Great Lakes. This was a time of slow economic growth in Oregon. Many young persons leaving school in Portland headed south for brighter

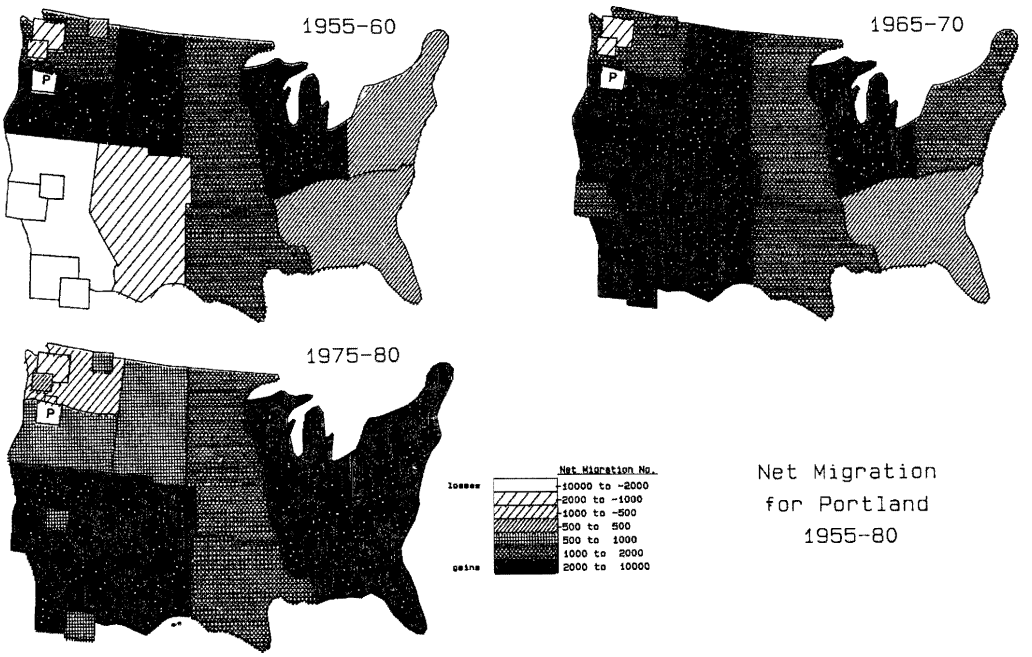


Figure 7.4: Net migration Between Portland and other U.S. regions for the periods 1955 - 1960, 1965 - 1970, and 1975 - 1980. Values are for net migration, the difference between the numbers of movers from each region to Portland and from Portland. Where the values shown are positive they indicate the numbers of migrants gained by Portland from each region. Where they are negative they show losses (*U.S. Census of Population*, special tabulations from the Public Use Micro Sample for 1975 - 1980 and from the reports on Migration between State Economic Areas for the 1955 - 1960 and 1965 - 1970 periods).

horizons in California. The net result was balanced, with population losses approximately equaling gains.

The 1960's resulted in a dramatic change in these patterns, especially with respect to California where Portland gained migrants during the 1965-70 period from California. The same gains resulted from most other regions of the U.S., with the exception of the Seattle-Tacoma area (Figure 7.4). This turnaround can be attributed to growth and diversification in the Portland economy. There was more reason to move to Portland - and less reason to leave.

The trends of the 1960's were accentuated during the 1970's (Holden, 1974). California continued to lose population to Portland through migration. Seattle and non-metropolitan Washington State gained population from Portland (Figure 7.4). A new development was an increasing number of movers from Eastern regions and a decreasing number from the Rocky Mountains - Great Lakes regions (Sanders and Long, 1987). These latter areas had been a stable source of inmigrants to

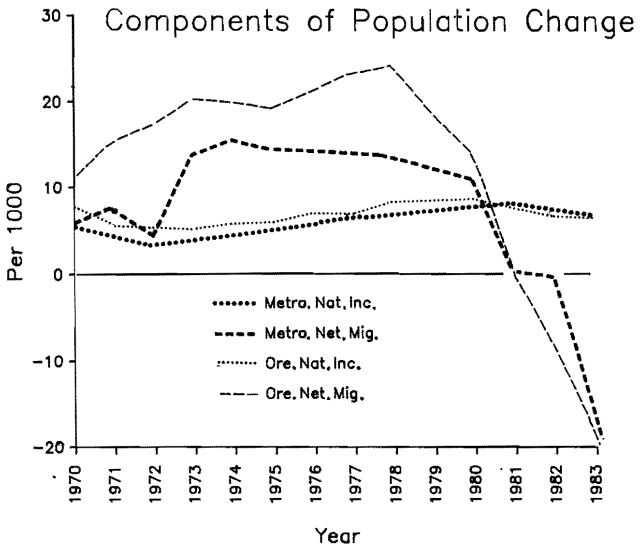


Figure 7.5: Components of population change for Portland for 1970 - 1983. Natural increase is the net of the numbers of births minus the number of deaths. Net migration is the net of the numbers of in-migrants minus the number of outmigrants (Estimates by the Oregon Center for Population Research and Census, various dates during this period).

Oregon for several decades. Migration to Portland from more distant regions probably resulted from the diversification of the Portland economy and the demand for workers with special skills needed by the instruments and electronic industries.

The rapid growth of Portland's population that occurred during the 1970's came to a rapid halt after 1980. The national recession and high interest rates resulted in a decline in demand for Oregon forest products which resulted in direct (such as in sawmilling) and indirect (such as in banking) adverse economic impacts in Portland. The natural increase in Portland's population (the numbers of births minus the numbers of deaths) was quite stable between 1970 and 1985 showing a gradual increase through the decade as the children born during the post World War II baby boom had their own families (Figure 7.5). Net migration for Portland and the remainder of the state rose during the early 1970's and remained high until about 1979 when it began to drop precipitously. By 1981 net migration was zero and by 1982 the loss through migration equaled the gain through natural increase. By 1983 both Portland and the remainder of Oregon were losing more persons through outmigration than were gained through natural increase (Figure 7.5). Both the Portland and the overall Oregon populations declined. Data are incomplete for more recent years, but suggest the beginnings of a recovery.

What can be said about the kinds of persons moving to the Portland metropolitan area from other regions?

Persons who move can be of any age and socioeconomic class. Many younger households migrate when they have few or no children. As families collect more possessions and children they move less often. However, retirement age results in relocation for some persons, sometimes to a new community, sometimes to nearby housing that better meets their needs.

There are some distinctive contrasts between the households that moved to the central city from other regions and those moving to suburban areas of Portland (Lycan et al, 1978). Generally, persons moving to the central city (Portland) are younger and less economically established than are movers to suburban areas (Table 7.3). Also, movers to the central city include a large portion of single person households and one parent households whereas households moving to suburban areas are more often families with children. The differences in these migration streams is largely a result of different housing opportunities in central city and suburban areas, but they also reflect the more complex process of selecting a neighborhood and residence in a central city type neighborhood where the condition of the structure, the social composition of the neighborhood, and the quality of the schools may be more difficult to ascertain for a newcomer.

The residential locations that people choose when moving to Portland are quite varied including both central city and suburban areas (Figure 7.6). Persons moving to a new city often are unable to search for housing at their leisure but must decide where to live after a

Table 7.3. *Characteristics of movers to Portland city and suburb areas (Lycan, 1977)*

A. Age of Head of Household

Age	Movers from Outside SMSA (percent) To City	To Suburb
18 & under	8.9	5.2
19-24	10.0	6.6
25-34	36.6	32.8
35-44	8.9	14.8
45-59	16.7	31.1
60 & over	18.9	11.5

B. Household Income

Income ($000)	Movers from Outside SMSA (percent) To City	To Suburb
Under 5.0	21.8	14.0
5.0 - 7.4	11.4	5.3
7.5 - 9.9	9.2	5.3
10.0 - 14.9	20.7	33.3
15.0 - 19.9	13.8	15.8
20.0 - 29.9	19.5	10.5
30.0 - 39.9	3.4	8.8
40.0 & over	.0	7.0

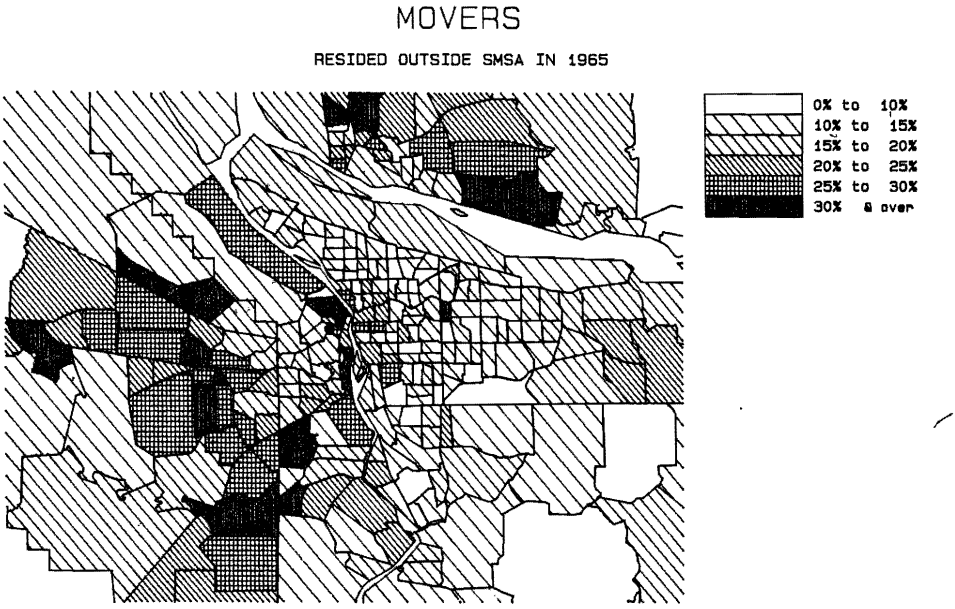


Figure 7.6: Persons who resided outside of the Portland metropolitan area in 1975. Areas shaded in darker tones indicate concentrations of inmigrants from outside the Metropolitan Area *U.S. Census of Population: 1980, Census Tracts*, 1983).

few days of looking. The locations within the metropolitan area that contain the largest proportion of residents who moved in from outside include areas near downtown but also suburban areas where there are large numbers of apartments or where new housing has been constructed (Kirshenbaum, 1972; Newwitt, 1984).

POPULATION SHIFTS WITHIN PORTLAND

Each year tens of thousands of persons relocate their residence within the metropolitan area. These moves take place mainly as a result of life cycle changes such as leaving the parental home, marriage, the birth of children, and adjusting to lessened housing needs with departure of children and with death and divorce. Changing economic circumstances also may cause or facilitate a change in residence (Simmonds, 1968). Among the four counties of the Portland Metropolitan area the largest streams of movers are between Multnomah County and the three other more suburban counties (Figure 7.7). The direction of the net migration during the 1975-80 period was clearly away from Multnomah Co. and toward the suburbs. The exchange between the three suburban counties only was at a much lower level and it did not result in much redistribution of population. The moves between urban and suburban areas tend to result from differing housing needs of smaller and larger families. The young, the elderly, and other smaller households generally move to more urbanized regions while middle aged larger households with children tend to move to the suburbs (Table 7.4). A move from one suburban

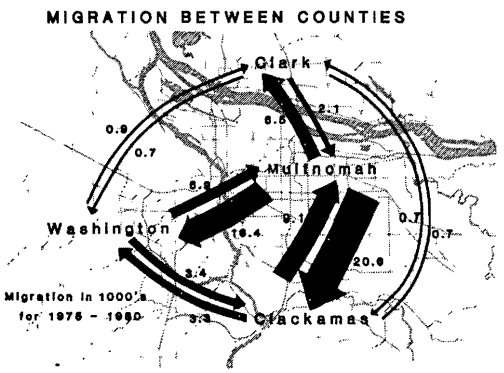


Figure 7.7: Migration between counties in the Portland metropolitan area, 1975 - 1980 *U.S. Census of Population: 1980,* special tabulations of the Public Use Micro Sample, 1983).

area to another yields much the same range of housing possibilities. Also, people tend to search for new housing in areas that they are familiar with, if possible. Persons living in one suburban county often are not very familiar with housing opportunities in other distant suburbs.

The motivations of persons moving between various areas of the metropolitan region are diverse but display some distinctive patterns (Figure 7.8). Generally all classes of persons who moved cited various cost and space factors related to their present and previous residence as being important in the decision to move and in the choice of a new residence (Lycan et al 1978). Persons moving to the suburbs often mentioned crime rates and the inadequacy of police protection as reasons that influenced them to move from the city. These persons also tended to mention the physical

Table 7.4 *Characteristics of movers within Portland metropolitan areas (Lycan, 1977).*

A. Age of Head of Household	Percent Movers by type		
Age	City to City	City to Suburb	Suburb to City
18 & under	5.6	4.9	2.4
19-24	10.7	4.9	13.5
25-34	45.1	50.0	43.6
35-44	16.5	15.7	15.8
45-59	10.8	12.8	15.1
60 & over	11.3	11.7	9.5

B. Household Income	Percent Movers by type		
Income ($000)	City to City	City to Suburb	Suburb to City
Under 5.0	21.8	14.0	9.2
5.0 - 7.4	11.4	5.3	6.7
7.5 - 9.9	9.2	5.3	11.7
10.0 - 14.9	20.7	33.3	19.2
15.0 - 19.9	13.8	15.8	21.7
20.0 - 29.9	19.5	10.5	20.0
30.0 - 39.9	3.4	8.8	5.0
40.0 & over	.0	7.0	6.7

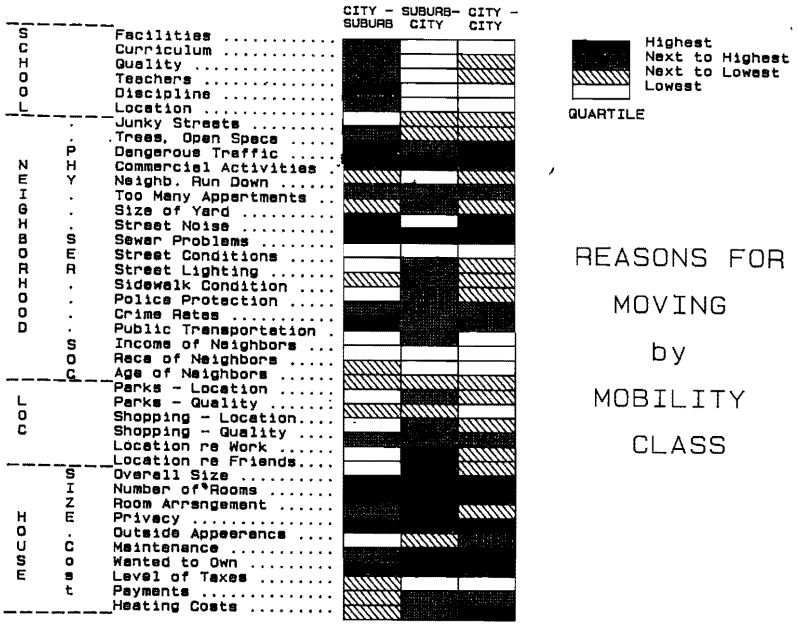


Figure 7.8: Specific reasons for moving within Portland from a previous residence. Based on a survey of 400 persons who moved between 1972 and 1977. Darker areas on the diagram indicate reasons indicated by the respondents to be most important (Lycan et al, 1978, *Residential Mobility Study for Portland, Oregon*).

features of their neighborhood such as trees, open space, maintenance of the neighborhood, noise, and intruding commercial activities as being important in their decision process. The quality of schools also was a critical factor for some people leaving the city for the suburbs (Figure 7.8). Of course many persons moving from the suburbs to the city did not have school age children and would not be expected to give much weight to this factor. Persons who moved from the suburbs to the city and those who moved within the city more frequently mentioned the convenience of access to shopping, friends, work, and parks. Persons moving to or within the city more often mentioned the quality of city improvements and services such as street maintenance and lighting and public transportation as reasons for moving (Figure 7.8).

If the diverse reasons cited above are grouped into a small number of categories and the results mapped one can get a kind of bird's eye view of the reasons Portlanders gave for moving (Figure 7.9). Housing structure (space and condition) was universally important as was housing cost, except that it was mentioned less often in several high income districts in Southwest Portland and in moderate income districts in North and outer Southeast Portland. Inaccessibility of work place, shopping, and urban amenities was an important reason for leaving (except in the same regions described above in the

discussion of housing costs). Schools were an important reason for leaving only in several North Portland districts. (Figure 7.9). The social characteristics of neighborhoods seemed not to be an important reason for leaving, but the map shows that those who thought it to be more important lived in inner city locations. The quality of services was an important reason for leaving for many persons, but not for some living in the Southeast and Southwest areas of the City. Finally, neighborhood physical environment was an important reason for leaving (Figure 7.9). For example, people moving from the city to the suburbs tended to mention poor maintenance of housing and yards and the littered conditions of streets.

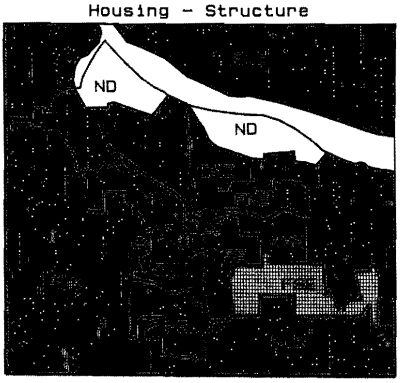
NEIGHBORHOOD DEMOGRAPHIC CHANGES

Some demographic changes are highly visible. Suburban expansion results in new buildings and roads which change the landscape. To a lesser extent the demolition of older housing and its replacement by commerce or office type activities is noticed, although once demolished these areas may soon be forgotten. Other demographic changes are even more subtle, especially where there is little physical change. For example, the changes in the numbers and ages of children in certain areas of Portland have resulted in major shifts in the demands for education; this results in the need to revise attendance area boundaries and in some cases the closing of recently built high schools. An example of the way in which age structure can be an indicator of other changes can been seen in the increasing numbers of children in older neighborhoods where increasing numbers of black families have recently settled.

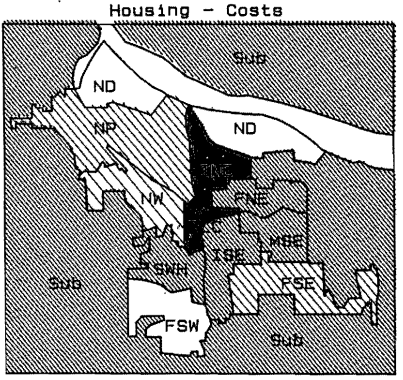
One important national trend that has affected Portland is the decline in the birthrate. The suspected reasons for this decline have been described in detail both in the professional demographic literature and in the popular media (Glick, 1984; Bloom, 1986). Generally they are thought to include the increased use and acceptability of contraceptive methods, the increasing participation of women in the labor force, and a number of broad social and economic issues concerning the value of larger families. These trends have affected Portland in much the same way that they have affected other cities. The average household size for the incorporated city of Portland declined sharply between 1960 and 1980 (Oregon, Center for Population Research and Census, 1977; U.S. Census Bureau, 1971, 1981). The average number of persons living in single family units declined from 3.09 in 1960 to 2.68 in 1980, with especially rapid declines occurring during the 1970's (Table 7.5). This is reflected in a reasonably simple pattern of peripheral decline and central city increase (Figure 7.10A). The increasing single family household size is somewhat misleading, however because it occurs in areas with relatively small numbers of single family housing units (Figure 7.10B). A significant pattern of increasing household size can be seen in the census tracts to the north of the central city area where younger black families have replaced older white families as houses became available on the for sale or rental market (Figure 7.10A).

The reasons for these changes include: (1) the national decline in birthrates, (2) postponement of the starting of families by many women (3) families with children opting to live in suburban locations for space and educational

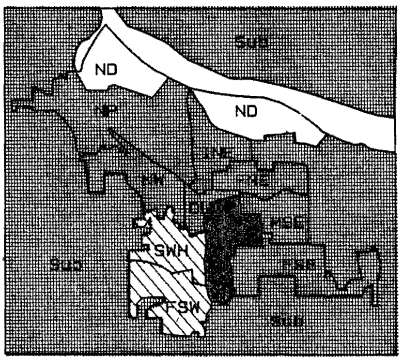
Housing - Structure



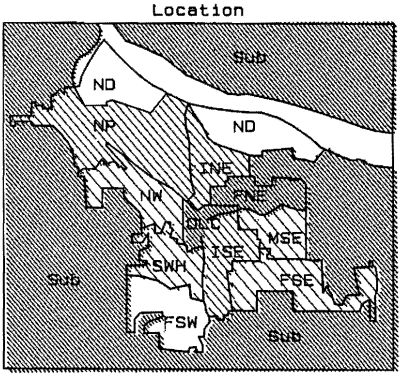
Housing - Costs



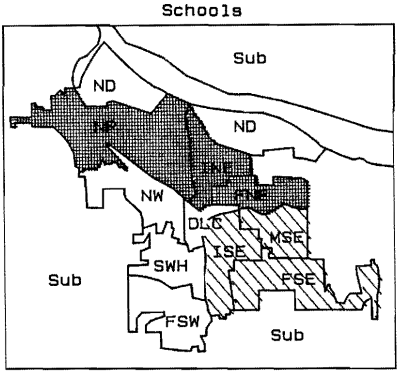
Physical Environment



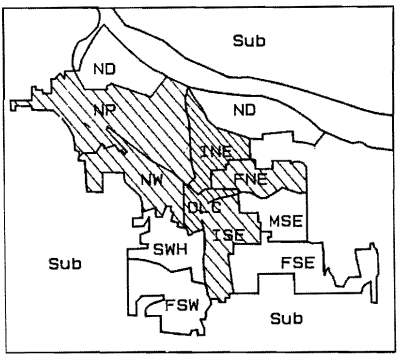
Location



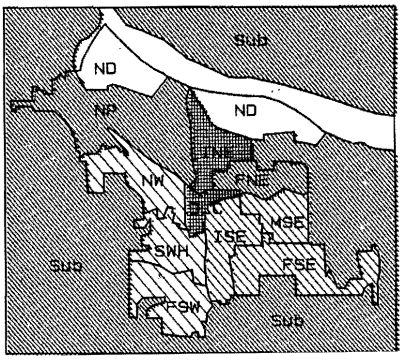
Schools



Social



Services



Reasons for Leaving

NE - Northeast
NP - North Portland
NW - Northwest
INE - Inner Northeast
ISE - Inner Southeast
MSE - Mid Southeast
FNE - Far Northeast
FSE - Far Southeast
SWH - Southwest Hills
SUB - All Suburban Areas

Table 7.5. *Average household size for city of Portland (U.S. Census Bureau 1962, 1972, and 1982 and State of Oregon, 1977)*

Type of Unit	Year 1960	1970	1974	1976	1980
Single Family	3.09	2.98	2.77	2.71	2.68
Multiple Family	1.70	1.67	1.65	1.69	1.62
Overall	2.80	2.56	2.38	2.33	2.31

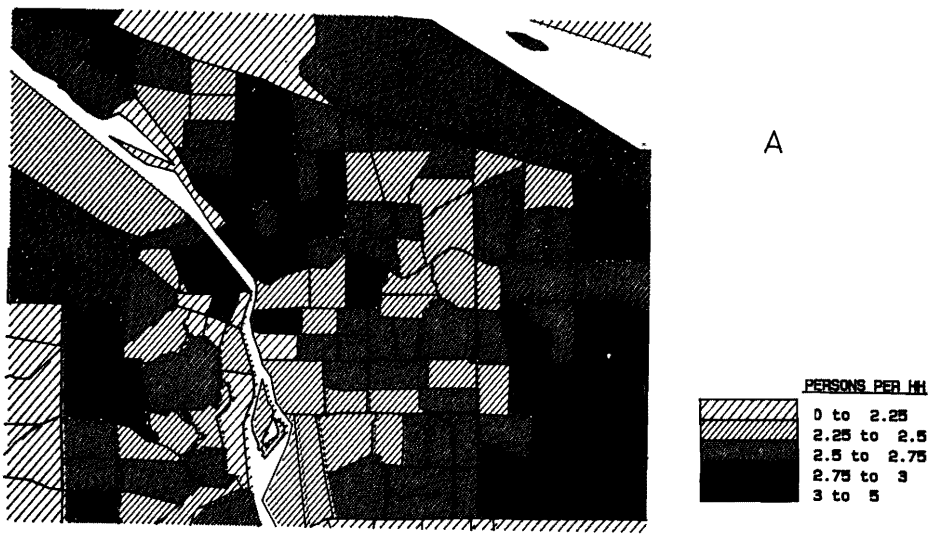
reasons, (4) the effects of high interest rates in keeping younger families from buying homes in established city neighborhoods, and (5) the high rate of divorce and separation, resulting in more one person and one parent households (Russel, 1981). The geographical implications of these changes include spatially changing demands for various types of human services, especially preschool through high school education and health care. Inner city hospitals have closed or have been converted to specialized functions such as drug and alcohol treatment. Generally the demand for maternity and related services has shifted to the suburbs, although the proximity of Emmanuel Hospital in northeast Portland to the black community with its many younger families is an exception to this trend.

Another national pattern which has had important impacts on Portland is the maturing of the post World War II "baby boom" generation (Robey and Russel, 1984). These children, born in the years following 1945, were in their late thirties to early forties during the 1980's. Consequently they were at a point in their lives when they were shifting residences in order to have space to raise an expanding family. This was a difficult time in some respects for this group because the high mortgage rates made it difficult for them to purchase homes. During the latter part of the 1970's inmigration to Portland also put pressure on the housing market and decreased the range of choice for house rental or purchase. One benefit of the local 1980's recession was to lower housing occupancy rates and create more rental opportunities for this group.

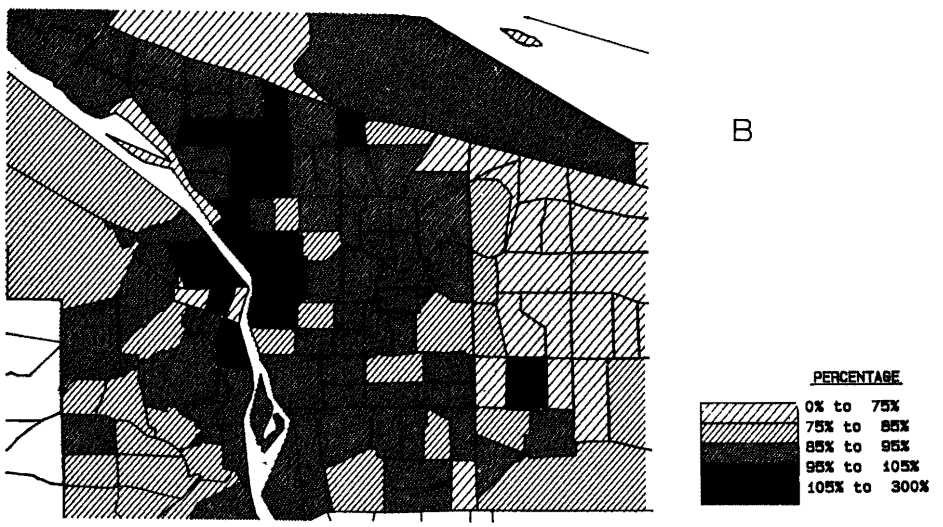
One type of neighborhood that absorbed "baby boom" families during the 1970's and 1980's was the older inner city containing houses build during the 1920 to 1950 period and dotted with small apartment clusters and flats converted from large single family dwellings (Chall, 1984). This is nicely illustrated in the inner city of Southeast Portland in census tract 12.01 which includes portions of the Sunnyside and Buckmann neighborhoods (Figure 7.11). Its inner edge has been eroded by conversion to commercial uses but its outer southeast edge includes a

Figure 7.9: Generalized reasons by Portland planning district for moving from a previous residence. Based on a survey of 400 persons who moved between 1972 and 1977. Darker areas on the map indicate areas of the City where particular reasons were most frequently cited as important (Lycan et al, 1978, *Residential Mobility Study for Portland, Oregon*).

Single Family Household Size - 1980



Change in Single Family Household Size



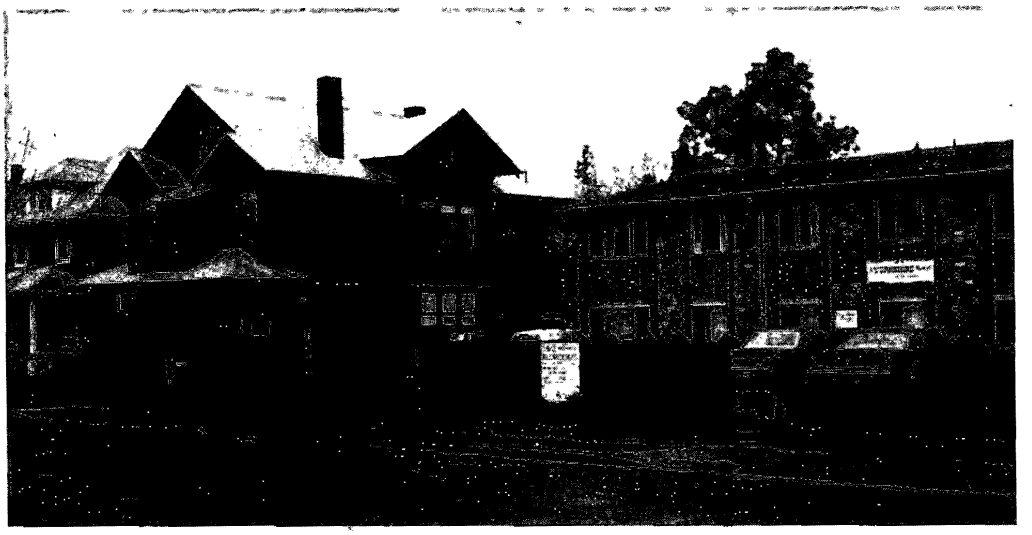


Figure 7.11: A typical inner city area in the Sunnyside neighborhood with a mixture of smaller households composed of young single individuals, families with no or few children, and older persons. This area is one that accommodated many of the baby boom children when they left their parental homes.

Figure 7.10: Single family household size. Illustration A shows the average number of persons per household for single family units. Darker areas on the upper map indicate areas of larger household size. Illustration B shows 1980 single family household size as a percent of 1970 single family household size. Darker areas on the lower map indicate areas of increasing household size (*U.S. Censuses of Population for 1970 and 1980*, special compilations from summary tapes.)

number of well preserved owner occupied single family housing units. The area's population in 1980 included a mixture of diverse age groups (Figure 7.12). The largest number of persons were young single individuals, couples without children, and households comprised of unrelated individuals along with a few families with younger children and a contingent of elderly.

The Sunnyside neighborhood experienced major demographic changes during the 1960 - 1980 period. Some of this change is evident in the number of small apartment clusters that have replaced old single family housing and in the multiple mail drops and entryways in many large old residential structures. The most dramatic change is the large and rapid increase of people in their twenties and early thirties that relocated to this neighborhood during the 1960's and 1970's while at the same time there was a loss in the number of older families and children (Figure 7.13). These changes were largely due to the building of apartments and the conversion of single

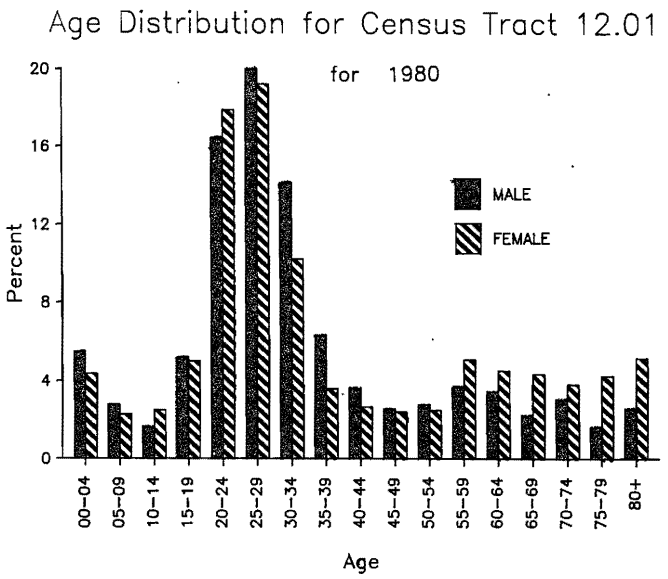


Figure 7.12: Population by age and sex for Sunnyside, an inner city neighborhood. The diagram shows the age - sex composition in 1980 for census tract 12.01. Note the small numbers of families with children and the large numbers of young adults and elderly *U.S. Census of Population: 1980*, special compilations from summary tapes).

family units to multiple family units during the 1960's. There was not much construction activity in this area during the 1970's, however, so most of the change in age structure reflects different types of households moving into the same housing units. Portland is fortunate to have many such mixed but attractive residential neighborhoods for accommodating the changing housing needs of the population (See also Chapter 5).

SLOWING THE EXODUS TO THE SUBURBS

The loss of population from the central city to the suburbs during the 1970's created a concern on the part of the City's leadership over the potential decline in tax base and a fear that those who remained would be poorer and would require more services (Portland, Housing Task Force, 1977). There also was a concern over the loss of persons to provide leadership and who would be long term residents of the City and would identify their interests with those of the central city. These fears may not all have been well founded (Lycan et al, 1978). The loss in numbers of persons did not equate to a loss in the numbers of households. The declining numbers resulted more from the increasing numbers of smaller households. Younger, smaller households moved to the City and older larger households moved to the suburbs. However, there is no clear evidence

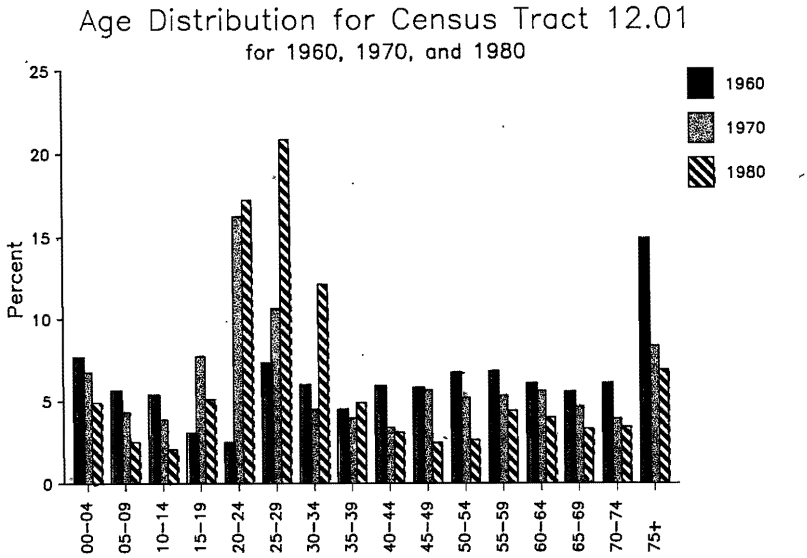


Figure 7.13: Change in age distribution for an inner city neighborhood from 1960 to 1980. The diagram shows the changes in numbers of persons by age category from 1960 to 1980. Note the dramatic increase in numbers of young adults and the decline in numbers of children and older persons (*U.S. Censuses of Population for 1960, 1970, and 1980;* special compilations from summary tapes).

that the City was becoming a refuge for the poor. A survey in 1977 showed that households moving from the city to the suburbs during the 1970's had an average income of $18,900 while households moving from the suburbs to the city had an average income of $18,000 (Lycan et al, 1978). While this difference is significant, one must keep in mind that households moving to the city were younger with their peak earning years ahead of them. Also these households were smaller, thus sharing the average of $18,000 per household among fewer household members indicating higher per capita levels of consumption.

In any event, the City of Portland under then Mayor Goldschmidt embarked on a comprehensive effort to encourage persons to live in the City of Portland, rather than choosing to move to the suburbs (Portland, Housing Task Force, 1977). The program was multifaceted, attempting to encourage families with children to move to or stay in the City's residential neighborhoods as well as attempting to encourage the building of new housing in the central city areas. Some of the objectives of these programs have been achieved.

There has been considerable construction of housing in the areas close to downtown, including the McCormick Pier, Johns Landing, and other waterfront type areas (See Chapter 3). The increasing numbers of two wage earner families without children and single individuals who desire the special amenities and convenience of this type

of setting made this possible, although public subsidies were required in some cases. In addition, there has been some movement of families with children into older inner city neighborhoods where the residential nature of the neighborhood was preserved. One factor that was recognized as important in encouraging families to move to or stay in the city was the improvement of the quality of the schools (Lycan et al, 1978; Portland, Office of Planning and Development, 1977) . Another was the reduction in the threat of crime. Whether these conditions have improved significantly in the city is not clear, but conditions in the suburbs today are not much better. In any case there has been an increase in housing opportunities in central city areas and some movement of families to central city neighborhoods. There are several factors other than conscious policy that have encouraged these trends. The larger number of smaller two wage earner families have made close in locations more attractive to a number of households. The high mortgage interest rates that prevailed during the latter half of the 1970's and the early part of the 1980's decreased the opportunity for families with increased space needs to buy a house in the suburbs.

The degree to which the patterns of residential location have changed in the last 10 years in response to City policies can be viewed by comparing trend projections of population made during the 1970's with what has actually transpired (Figure 7.14). A projection of the population of census tracts for Portland was made by the Center for Population Research at Portland State University in 1975 based on contemporary housing and demographic trends (Lycan and Weiss, 1975, 1979). The projection of historic patterns suggested continuing rapid suburban development and a continuation of the loss of central city housing due to urban renewal and private redevelopment in central city areas. However, actual 1985 population was greater than predicted in many areas nearby the downtown core area (Figure 7.14). By contrast, actual population growth was much slower in suburban areas than the projection of 1970's trends would have suggested. This indicates that some of the efforts by the City to encourage the building of more central City housing are working. It also suggests that comprehensive plans aimed at containing the spread of population within defined urban growth boundaries may have had some effect on limiting suburban growth. Of course the market factors that limited the construction of suburban single family housing also tended to produce the same result.

PROSPECTS

Today Portland is at an important crossroads in its development. A high level of liveability has been maintained. Portland has many attractive older residential neighborhoods, new downtown housing, and relatively affordable newer suburban housing. However, the growth of the metropolitan area's population has been slow since before 1980. Also as more children are born to the post World War II baby boom generation these families may move from the central city to suburban housing. This may result in a new drain on the human and financial assets of the central city. The key question facing Portland is whether the changes in the metropolitan region's economy toward services and light industry will provide the basis for sustaining economic growth for the region (see Chapter 10). This issue is part of a much broader international issue of the

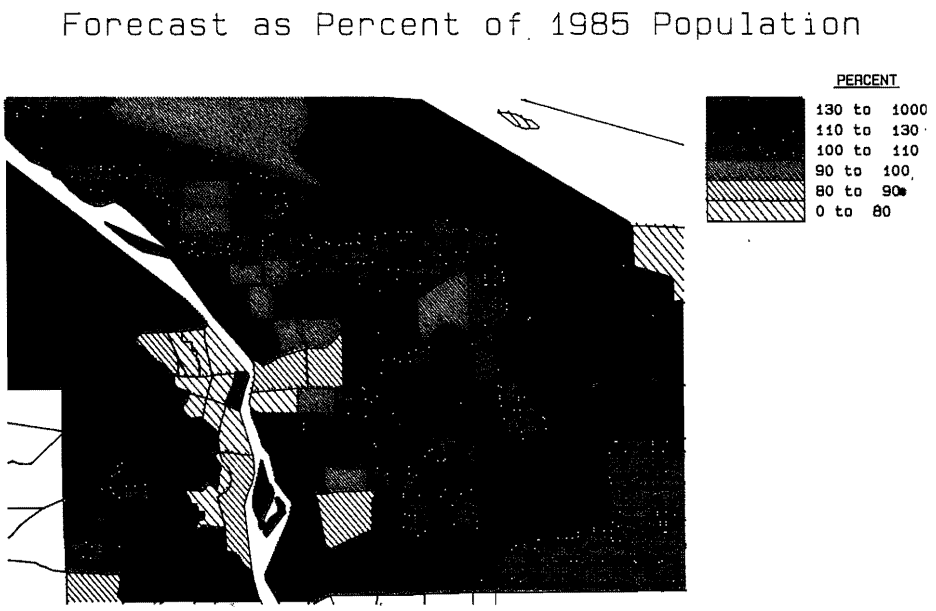


Figure 7.14: Actual and forecast population growth. Areas shown in darker tones on the map contained more population in 1985 than that projected by population and housing trends current during the mid 1970's (Oregon Center for Population Research and Census, 1975, *Population Projections, Oregon Administrative District II* and *Metropolitan Service District, Census Tract Population Estimates*, 1975).

competitiveness of the American economy in high technology manufacturing and services.

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Chapter 8
Portland's East Asian Connection

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Within the past century most Americans have come to dwell in cities. This concentration of people in particular places is a significant feature of contemporary society, creating an unprecedented opportunity to analyze the characteristics of urban populations and their ethnic make up. Such study is not new; Shakespeare himself immortalized it in the famous observation, "What is the city, but the people?" (Shakespeare, *Coriolanus*, Act. III, Sc. 1, line 198). The geographer, however, is less a student of people than of place, and this distinction suggests the perspective developed in this chapter, the identification of residential settlement patterns of Chinese, Japanese, and Koreans which together comprise the Portland East Asian ethnic community.[1] By focusing on the East Asian case, utilizing primarily 1980 population census materials and computer assisted techniques for mapping of the data, the distribution patterns for these ethnic groups can be determined and evaluated.

The west coast of the United States has been an historically important zone for East Asian settlement. Portland has absorbed waves of immigration from Asia and the Pacific, and each has left a distinctive mark on the landscape, including local architecture, well-delimited Japanese and Chinese neighborhoods, and commercial centers of ethnic activity. Portland features a rejuvenated commercial Chinatown, one recently graced with an impressive traditional gate and complemented by streets named in Chinese and English, (Figure 8.1). The City supports several dozen East and Southeast Asian restaurants, providing an Oriental flavor and commercial landscape. Portland also has a beautiful Japanese garden generally acknowledged to be one of the finest of its kind in the United States (Figure 8.2). These urban landmarks suggest the importance of East Asian influences on the character and function of the city.

RESEARCH PROBLEM

A relatively large amount of information is now available regarding the North American experience of East Asian minority groups (Endo, 1980; Hundley, 1976, Perrin, 1981). Much of this literature deals with the process by which Asian sojourners become Americans (Knoll, 1982). In the case of Oregon, an inventory of library holdings at the Oregon Historical Society and Portland State University indicates that there is a small but valuable set of resources available for the student of Chinese American (Chen, 1973; Ho, 1978; Manchester, 1978) and Japanese American

1 *The definition of East Asia, limited to consideration of Chinese, Japanese, and Korean ethnic groups, is an orthodox one. Questions can be raised about the Census' definition of these three groups, particularly since some Southeast Asian nationals will identify themselves as Chinese. Further research on the accuracy of Census totals and definitions is needed.*

Figure 8.1: Entry gate to Portland's Chinatown District erected in 1986 at the corner of Burnside and Fourth Street (Photo: The Oregonian, Marv Bendarowicz).

history (Ito, 1973; Kohl, 1982; Yasui, 1973 and 1975), but a relative dearth of information on Korean Americans. With regard to the Chinese and Japanese, the bibliographies by Chen (1973) and Yasui (1973) are recommended as departure points; the single best source for the Northwestern United States is the annotated bibliography project completed at the University of Washington (Yoshitomi, 1978) which includes a small number of references to Korean experiences in the region, including Oregon.

A characteristic of this East Asian literature is its emphasis on the process of acculturation over time, particularly in terms of those who attempted to

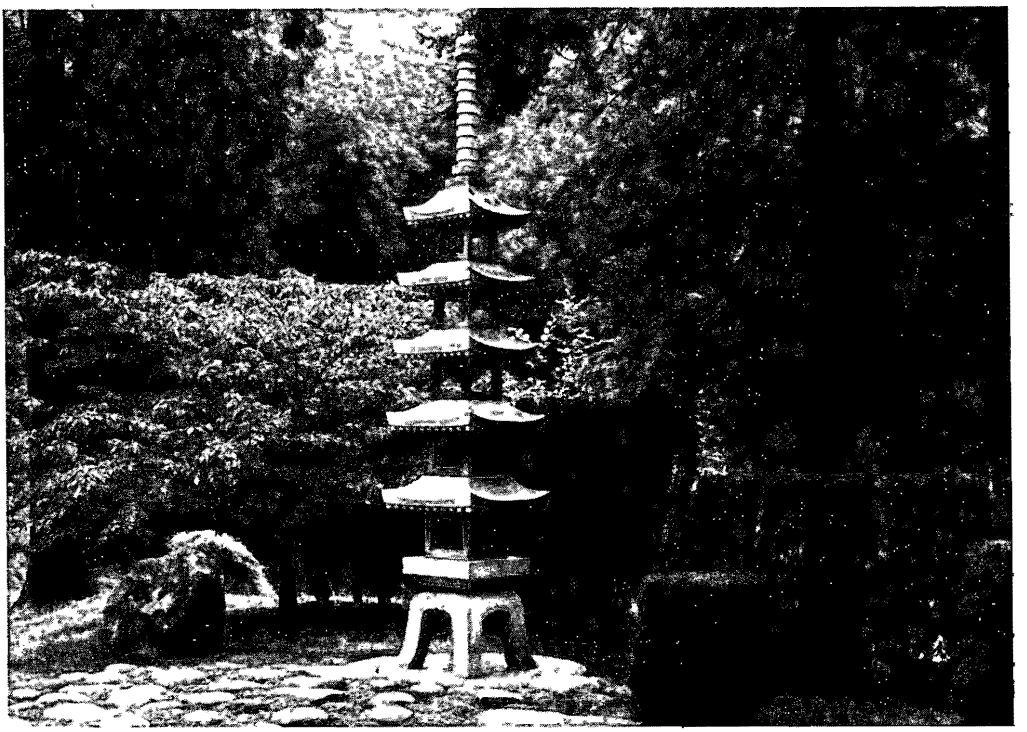


Figure 8.2: Spring view of Portland's Japanese Garden showing hand sculptured pagoda donated by Mayor Yosaku Harada, Sapporo, Japan (Photo: Greater Portland Visitors and Convention Association, Inc.).

exclude East Asian minority groups (Hundley, 1976). The experience of those who were excluded, and locational factors, are given short shrift (Daniels, 1976; Iriye, 1976; Jolly, 1974). This observation is somewhat paradoxical since research on problems related to assimilation of an ethnic group may be limited to a particular part of the United States, such as the West Coast (Knoll, 1982; Mears, 1928), a particular state (Yasui, 1975), or urban or rural areas (Ho, 1978; Lyman, 1970). With few exceptions (Jolly, 1974; Kobayashi, 1984; Lyman, 1968), however, analysis of place of residence, or community, is overshadowed by preoccupation with ethnic identity in a pluralistic society (Fujii, 1980).

The distinction between ethnic identity and an ethnic group's experience of place is the focus here. This investigation concentrates on the contemporary distribution of Japanese, Chinese, and Korean minorities in the Portland-Vancouver Standard Metropolitan Statistical Area (SMSA). Distinctive population distribution patterns are identified through analysis of selected spatial and socio-economic characteristics of the 1980 census data, including delimitation of the Portland and Vancouver East Asian ethnic enclaves. The discussion concludes with a set of tentative observations which might guide future

research on the relationship between location and ethnic experience in the Portland case.

THE STATE

Oregon is said to be composed of two economies with distinct functional and locational characteristics, Portland and the rest of the state. Portland accounts for more than one-half of all manufactured goods and includes a growing high technology sector (see Chapter 10). The rest of the state is composed largely of primary industries, e.g., forestry, agriculture, and fisheries. Oregon's population geography follows closely on this division. Of 2,639,915 people in the state, Portland (366,520) accounted for 13.8 percent; this figure jumps to 39.9 percent or 1,053,100 people when calculated in terms of the tri-county area of Clackamas, Washington, and Multnomah counties. The balance of the state's population is found outside this core area, with smaller nodes of concentration in the central and southern Willamette Valley in Salem (90,195), Corvallis (41,300), and Eugene (105,750), as well as to the far south and east (Table 8.1).

The East Asian ethnic population distribution parallels the partitioning of the state into two regions with distinct settlement patterns. In total, there were 21,496 East Asians in Oregon in 1980; Japanese were the largest group with 8,580, followed by Chinese, 7,918, and Koreans, 4,998. Those counties with 400 or more people of East Asian ethnic descent included Multnomah, Washington, Clackamas, Benton, Lane, and Malheur (Figure 8.3; Table 8.1) Two observations regarding these six counties are that: Koreans were concentrated only in

Table 8.1: *1980 Population of selected counties and cities in Oregon and Washington (U.S. Department of Commerce, 1980, PC80-1-B39, pp. 139-141).*

State	
Oregon	2,639,915 (total)
Tri-County	1,053,100 (total)
Clackamas	243,000
Multnomah	562,300
Washington	247,800
Metropolitan	
Portland	366,520
Willamette Valley	237,245
Salem	90,195
Corvallis	41,300
Eugene	105,750
Clark County, Washington	192,227
1980 East Asian Population in Oregon	
Total East Asians	21,496
East Asians in Tri-County Metropolitan Area	12,901 (60%)
East Asians in Remainder of Oregon	8,595 (40%)

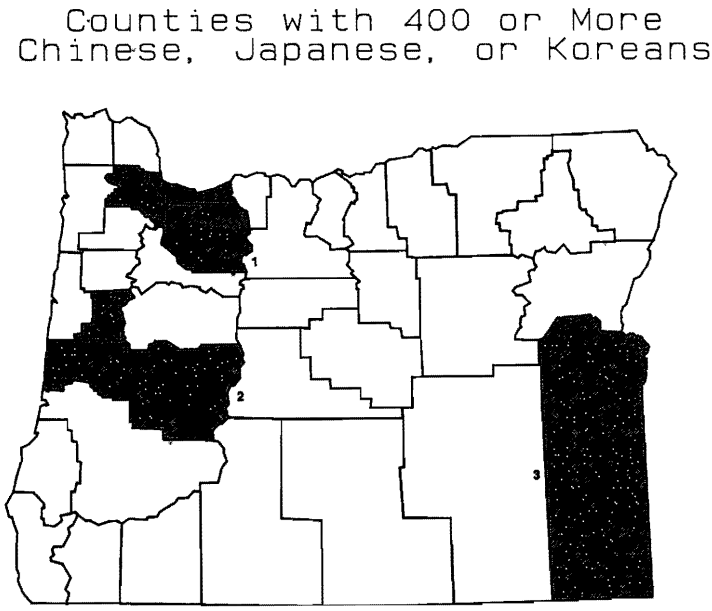


Figure 8.3: Distribution of East Asians in Oregon. Numbers indicate location of (1) Chinese, Japanese, and Koreans; (2) Chinese and Japanese; and (3) Japanese (U.S. Department of Commerce, 1980).

Multnomah, Clackamas, and Washington, based on the 400-level numerical designation; and Japanese outnumber Chinese at the state level, but Chinese (5,320), outnumber Japanese (4,755) in the tri-county Portland area.

The fact that the Portland's East Asian population can be distinguished in terms of the absolute number of Chinese relative to Japanese, as well as being the only place in the state with a relatively large number of Korean people, is significant. It suggests, first, that the vast majority of East Asian ethnic groups are associated with the state's urban areas. Secondly, although the historical experience of the Chinese and Japanese ethnic groups may be similar, including employment as laborers during early construction of the rail network in Oregon and employment as tenant farmers, it is the Japanese who continue to be involved in the state's primary sector (Knoll, 1982, pp, 47-85; Yasui, 1975, pp. 225- 57). Sample data in the 1980 census indicates that only .07 percent of the Chinese population were engaged in agriculture; the Japanese total was 9 percent (Table 8.2). A third point of interest, which pertains to all three ethnic groups, is the distribution of their respective populations in the tri-county area (Figure 8.3; Table 8.3). The highest concentration of each ethnic group is in Multnomah county, which includes Portland, but relative distribution of each differs for Washington and Clackamas counties.

THE PORTLAND-VANCOUVER SMSA

Discussion of the Portland-Vancouver SMSA requires a change of focus in terms of the numbers of people under

Table 8.2: *Selected social and economic characteristics of East Asian population (U.S. Department of Commerce, 1980, PC80-1-C39, p.83).*

Occupation	Japanese	Chinese	Korean
(total)	4,381	3,942	2,082
Professional	1,237 (28%)	1,223 (31%)	319 (15%)
Manufacturing	802 (18%)	487 (12%)	780 (38%)
Agriculture	396 (9 %)	30 (.7%)	66 (3 %)

Table 8.3: *1980 East Asian population, Portland-Vancouver SMSA, by county. (U.S. Department of Commerce, 1983, pp. 71-94).*

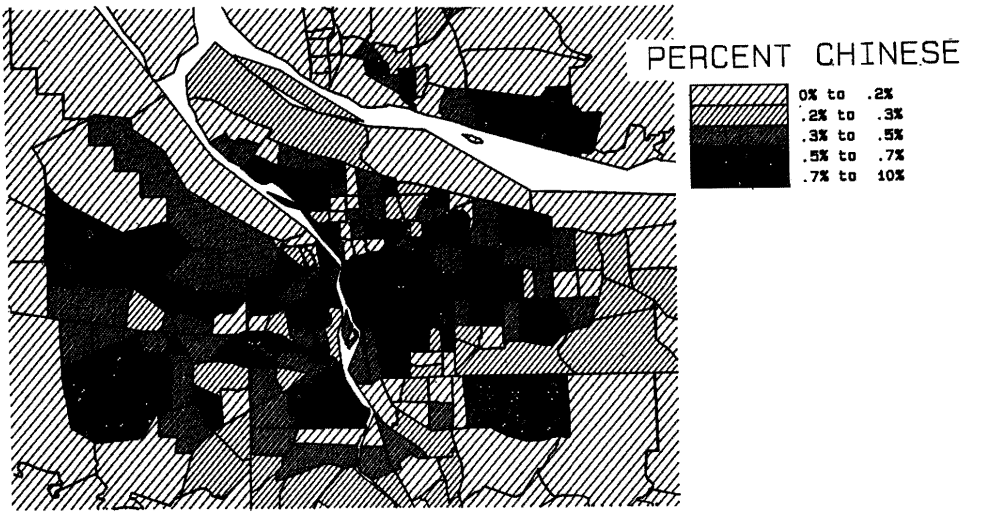
County	Chinese	Japanese	Korean	Total East Asians
Clackamas	380 (6.8%)	740 (14.7%)	411 (12.5%)	1,531 (10.9%)
Clark	323 (5.8%)	301 (5.9%)	462 (14.1%)	1,087 (7.8%)
Multnomah	4,012 (71.7%)	2,921 (57.8%)	1,252 (38.1%)	8,185 (58.7%)
Washington	877 (15.7%)	1,094 (21.6%)	1,165 (35.3%)	2,136 (22.6%)
Total	5,592 (100%)	5,065 (100%)	3,291 (100%)	13,939 (100%)

consideration, as defined by census boundaries. Such a shift is appropriate since analysis must narrow in on questions about ethnic distribution within a bounded area smaller than Oregon, yet extending beyond state boundaries. The Portland-Vancouver SMSA is composed of four counties, three in Oregon -- Clackamas, Washington, and Multnomah -- and one in Washington State -- Clark -- (see Chapter 7, and frontis map). Total area is 3,698 sq. mi.; the 1980 population equaled 1,261,030 people residing in 295 census tracts. The majority of the population of the Portland-Vancouver SMSA can be found in the incorporated areas of Portland, Vancouver, Beaverton, and Oregon City.

A distinctive feature of the Portland-Vancouver SMSA is its Asian population. Investigation of this point indicates that the total population of Asian and Pacific Islanders, 23,971, is third only to that calculated for people of Spanish descent and the Black American population (U.S. Bureau of Census, 1983). Further examination of the census reveals that the three ethnic groups comprising the East Asian population, Chinese (5,592 people), Japanese (5,056 people), and Korean (3,291 people), represent more than half (58.1 percent) of the Asian and Pacific Islanders total.

Two types of maps can be generated

Figure 8.4: Distribution of Chinese, Japanese, and Koreans in Portland-Vancouver SMSA as a percent of total population (U.S. Department of Commerce, 1980).


PERCENT CHINESE
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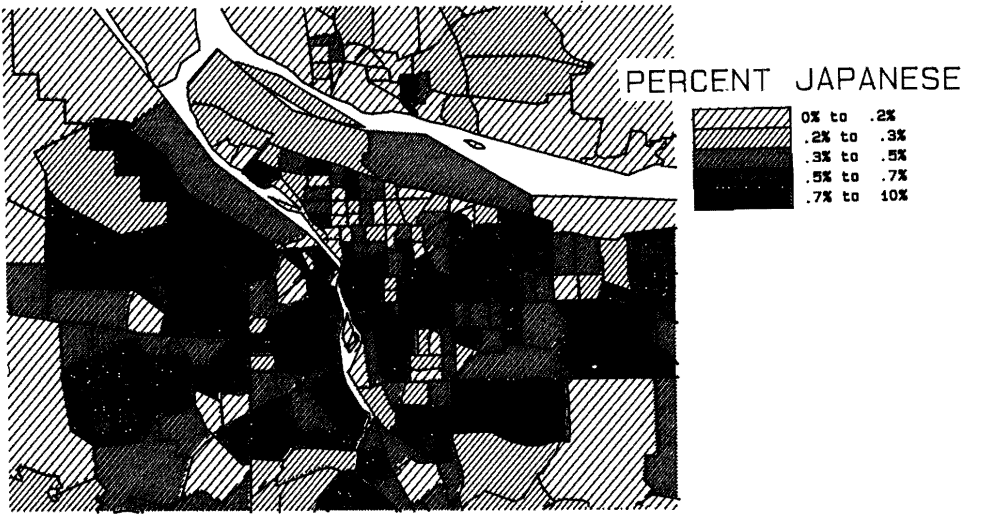
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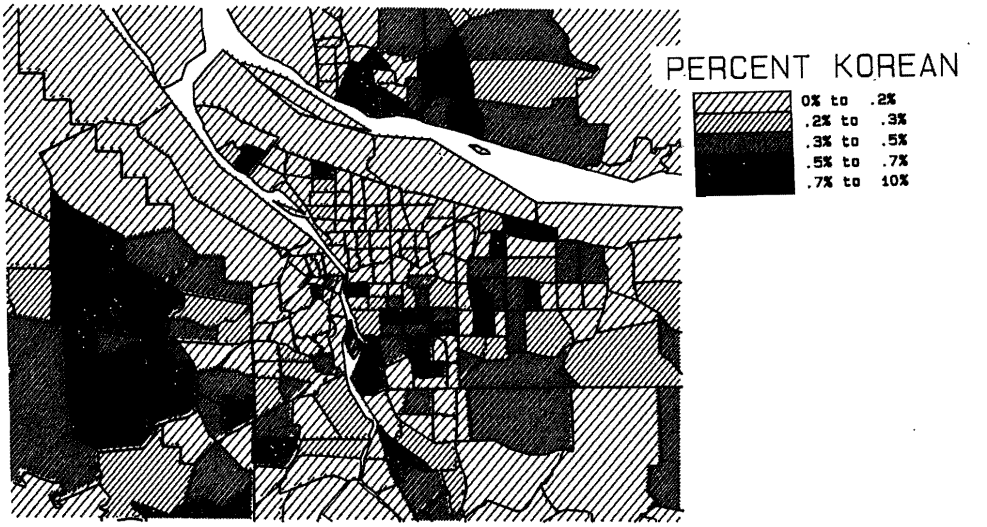
PERCENT KOREAN
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.3% to .5%
.5% to .7%
.7% to 10%

which help to pinpoint the distribution of the East Asian population. The first type plots a particular ethnic group as a percentage of the population found in each census tract (Figure 8.4). The second type plots the absolute population of a particular ethnic group as found in each census tract (Figures 8.5). In the latter case a composite map can also be designed which plots each tract in the Portland-Vancouver SMSA with 40 or more people of East Asian descent; based on this information it is possible to identify East Asian ethnic enclaves (Figure 8.6), an analysis of which is deferred until the conclusion of this section.

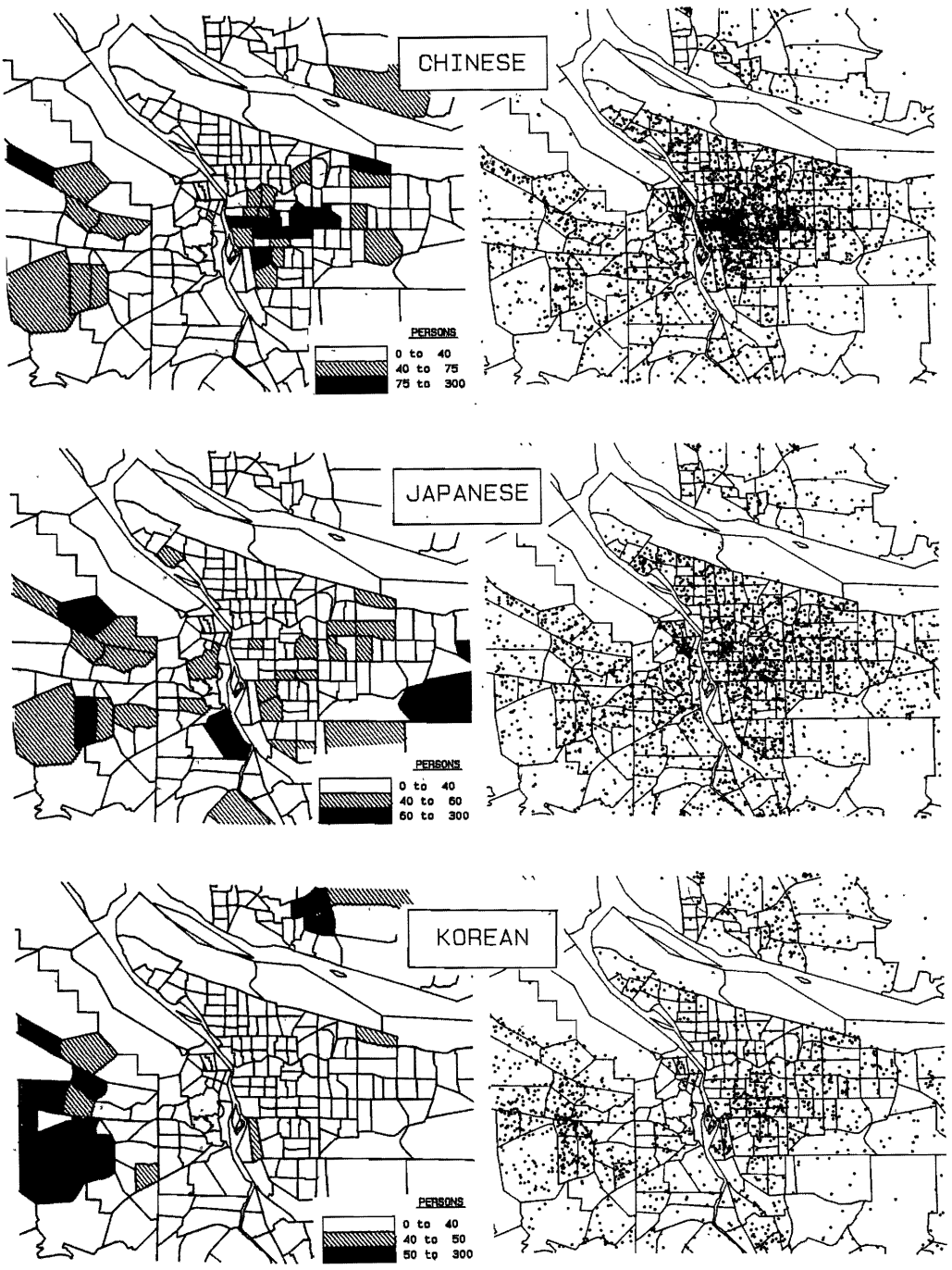
As a percentage of the total population in each census tract, the Chinese display the most concentrated settlement pattern of the ethnic groups under consideration (Figure 8.4). A large proportion of Chinese live in northeast and southeast Portland directly east of the Willamette River, between Holgate Boulevard and the Banfield Freeway. Northwest and southwest Portland also have a moderately large convergence, although the number of tracts is smaller and less markedly contiguous. Vancouver and outlying areas of the SMSA have low concentrations of people of Chinese descent.

The Japanese distribution pattern is the most dispersed of the three ethnic groups (Figure 8.4). In contrast to the Chinese, the Japanese are concentrated less conspicuously in a core area of northeast or southeast Portland and, at the same time, they are distributed more prominently in outlying areas, probably a reflection of their agricultural heritage. The exclusive and more affluent neighborhoods of southwest Portland, e.g., the Inner West Hills, contain a greater proportion of Japanese in comparison to other East Asians. Vancouver does not have a concentration of people of Japanese descent.

The most distinctive distribution pattern is provided by the Korean population (Figure 8.4). Only two tracts in southeast Portland reflect a convergence of this ethnic group; the tract nearest the east bank of the Willamette River appears to be related to commercial (restaurant) activity along U.S. Highway 99E. The highest concentration of Koreans, as a proportion of the total population, is located in Washington County in association with suburban agricultural areas. A second area of denser settlement, but representing a relatively small number of people, is to the north in Vancouver. The outlying areas support larger numbers of Koreans than Chinese, although the proportion is less than for people of Japanese descent.

The distribution patterns found in Figure 8.4 are generally reinforced by Figure 8.5, which displays the absolute number of East Asians found in the Portland-Vancouver SMSA. Differences can be observed, however, including the fact that the total number of people of Korean descent are almost evenly distributed between Washington and Multnomah Counties, and Clackamas and Clark Counties; this point can be contrasted to the aforementioned observation that the concentration of Koreans, as a percentage of total population, is higher to the west and to the north (Figures 8.4, 8.5, and Table 8.3). More importantly, mapping of the absolute population permits more accurate measurement of the degree of ethnic concentration and the extent to which

Figure 8.5: Distribution of absolute number of Chinese, Japanese, and Koreans in Portland-Vancouver SMSA (U.S. Department of Commerce, 1980).


CHINESE
PERSONS
0 to 40
40 to 75
75 to 300
JAPANESE
PERSONS
0 to 40
40 to 60
60 to 300
KOREAN
PERSONS
0 to 40
40 to 50
50 to 300
1 dot = 2 persons

it differs by ethnic group.

Fifty-nine census tracts in the Portland-Vancouver SMSA have 40 or more people who are ethnically East Asian (Figure 8.5; Table 8.4). This tract total represents 5,297 persons, slightly more than one-third or 38 percent, of the total East Asian population. The distribution pattern of those tracts with a relatively high number of each ethnic group is strikingly different. In the case of the Chinese, for example, 2,659 people (47.5 percent) of the total population are concentrated in 33 tracts (Figure 8.5). An additional indication of relative concentration is that nearly one-half of these tracts have 75 or more persons of Chinese descent; it is remarkable to note that 274 people, nearly five percent of the total population of this ethnic group, are found in a single tract in Multnomah county, 12.02, bounded by southeast Division, Hawthorne, 16th, and 30th Avenues.

The Japanese have a similar number of tracts with 40 or more people, 32 in total (Figure 8.5). In contrast to the Chinese, however, the tracts where Japanese live do not display such a high degree of concentration, representing just 1,718 persons (34 percent) of the total population for this ethnic group. Only six tracts display convergence of 60 or more people, all of which are located more than 10 miles from downtown Portland. Four tracts have 75 or more people but none has more than 100 persons of Japanese descent.[2] The highest tract, 315.03, with 94 people, is located in a rapidly suburbanizing part of northeastern Washington County.

In the case of the Korean population there are 15 tracts with 40 or more people, representing only 954 persons (28.9 percent) of the total population for this ethnic group (Figure 8.5). Nine of these tracts reflect conditions where there are 50 or more people of Korean descent; all are located in either Washington or Clark Counties. Four tracts have 75 or more Koreans and two have concentrations of 103 and 106 people, tracts 310.01 and 318, located contiguous to each other in Washington County, southwest of Beaverton.

A composite description of the Portland-Vancouver SMSA 1980 East Asian population geography, one that identifies ethnic enclaves, now becomes possible (Table 8.4; Figure 8.6). Based on the absolute population for each group, the pattern of settlement indicates that there are more census tracts with a relatively high concentration of all three minorities located in the western sections of the SMSA. Tracts with a convergence of Chinese and Japanese ethnic groups, on the other hand, are found primarily in northeast and southeast Portland. If the characteristics of relatively high density tracts are investigated in terms of socio-economic characteristics, slightly more than one-half of the East Asians live in areas where some 15 percent of the population are college graduates, and where the median housing value is between $40,000 to $60,000. Housing values and number of years of education differ by ethnic group; more than twice as many Chinese (52.4 percent) are living in more modest neighborhoods than is true of the Japanese (23.1 percent) (Table 8.5). These preliminary observations set the stage for additional research on East Asian patterns of settlement in the Portland-

2 *One of the census tracts with more than 40 people of Japanese descent, tract 332 (76 people), is not shown in Figures 8.4, 8.5, and 8.6 because of its location in the far western section of the Portland-Vancouver SMSA, between Cornelius and Forest Grove, Oregon.*

Table 8.4: *A Comparison of census tracts with 40 or more East Asians, median housing values, and percentage of college educated population (U.S. Department of Commerce, 1983,* 1980 Census of Population and Housing, *pp. 119-66).*

Tract	Japanese	Chinese	Korean	Median Housing Value	College Education Percentage
2	18	19	50	50,300	12.52
3.01	57	81	17	63,000	16.08
3.02	40	68	6	74,000	23.35
4.01	26	41	19	74,300	13.94
7.01	37	155	19	52,200	7.65
7.02	40	25	23	44,500	5.85
8.01	38	99	30	51,300	9.70
8.02	40	67	13	47,700	8.37
9.01	36	127	22	50,700	13.80
10	29	58	12	44,600	9.73
11.02	16	124	1	51,900	16.38
12.01	53	54	5	46,000	16.73
12.02	28	274	7	61,700	15.07
13.01	10	59	6	43,700	18.23
13.02	7	130	10	47,400	14.55
14	30	104	11	46,300	10.28
16.01	46	94	14	59,000	15.82
16.02	25	116	7	47,100	6.82
19	16	41	2	69,300	22.94
20	31	68	7	48,200	12.80
29.02	23	53	1	52,900	10.13
40.02	54	39	4	49,800	7.56
41.02	12	1	11	39,600	3.18
56	49	57	7	62,500	21.73
58	90	44	29	120,800	43.15
63	63	32	12	96,700	26.66
64.01	35	18	22	73,400	24.08
66.02	41	19	9	61,700	23.60
81	42	30	25	57,800	9.88
82.01	44	97	14	66,300	11.32
83.02	26	37	17	53,700	9.44
91	34	46	17	59,400	6.03
92.01	46	40	20	56,900	7.47
93	45	26	16	61,500	8.32
95	58	83	42	87,700	15.77
99	80	32	27	72,200	12.82
104.03	70	31	36	67,400	8.29
205.02	40	15	7	93,100	26.53
211	58	8	9	60,400	8.23
216.02	41	18	6	63,200	6.54
222.02	41	37	20	93,900	15.52
301	44	29	23	88,100	23.01
302	45	54	16	105,600	28.67
305	58	15	24	71,900	20.50
306	2	8	50	64,400	12.80
310.01	61	61	108	85,800	21.52
310.02	47	44	59	77,000	15.93
312	20	17	92	59,400	13.71
314.01	54	75	66	63,100	14.62
314.02	50	76	51	87,500	21.94
315.02	50	76	51	87,500	21.94
315.03	94	71	40	94,800	23.71
316.02	34	35	69	67,000	11.24
317.01	33	31	64	67,700	12.50
318	51	55	103	80,600	18.24
332	76	20	9	51,900	8.13
412.02	28	10	76	58,000	8.13
413.01	11	43	25	73,300	13.88
413.03	18	6	40	54,900	5.60
Total	2,343	3,220	1,591	avg. 64,800	avg. 14.65

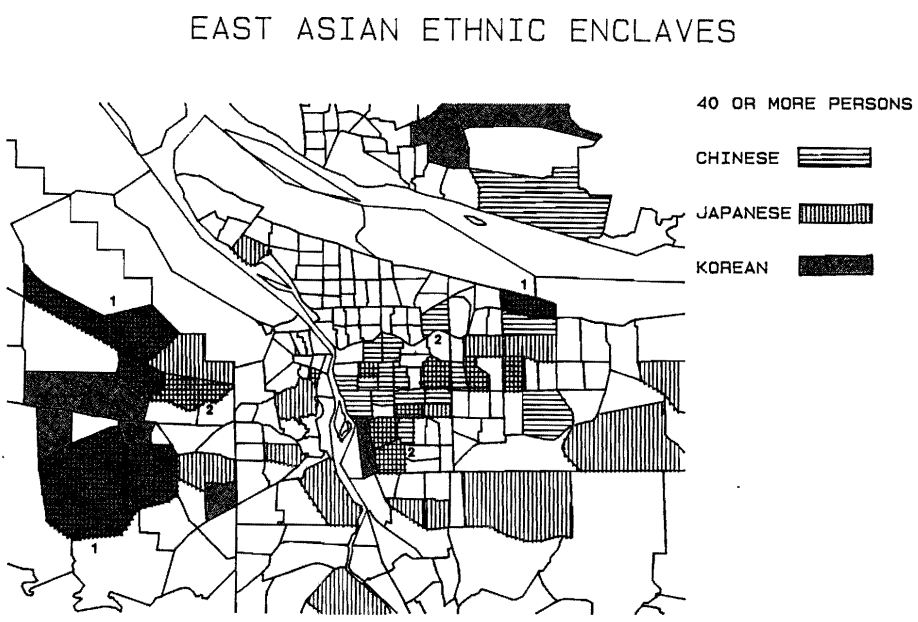


Figure 8.6: Distribution of census tracts with 40 or more Chinese, Japanese, and Koreans in Portland-Vancouver SMSA. Numbers indicate overlap: (1) all three ethnic groups; (2) Japanese and Chinese (U.S. Department of Commerce, 1980).

Vancouver SMSA, not only in terms of location and socio-economic characteristics, but from the perspective of history, degree of change over time, and the individual and collective urban experience of these minority households.[3]

CONCLUDING THOUGHTS

Delimitation of Oregon's, and Portland's East Asian population geography is instructive in several respects. Association with urban and suburban areas is a dominant characteristic. In the Portland-Vancouver SMSA, distinct settlement patterns can be identified for Chinese, Japanese, and Korean ethnic groups; the Lorenz Curve in each case shows that Chinese and Koreans have higher concentrations of population than is true of Japanese (Figure 8.7). These distribution patterns overlap in specific census tracts and the existence of East Asian enclaves raises intriguing questions about the relationship between location and ethnic experience. The 1980 Census is a rich resource for study

3 *Potentially intriguing questions include: how long has the ethnic group under study resided in a particular census tract; are the cultural landscapes of these neighborhoods distinctive; how has settlement pattern and ethnic composition changed over time; have centrifugal and centripetal forces, socio-economic or otherwise, contributed to the changing pattern of ethnic settlement; do minority groups perceive differently the neighborhoods they occupy; in what ways do neighborhood experiences of these groups shape collective and individual ethnic character; and is there, to reverse a commonly asked question, a distinctive East Asian perception of Portland-Vancouver?*

Table 8.5: *1980 Composite summary of selected population and socio-economic data for Portland-Vancouver SMSA: East Asians (U.S. Department of Commerce, 1983,* 1980 Census of Population and Housing, *pp. 119-66).*

Housing Value $	No. of Tracts	Japanese	%32 Tracts	No. of Tracts	Chinese	%33 Tracts	No. of Tracts	Korean	%15 Tracts
40-60,000	8	397	23.1	16	1,394	52.4	5	304	31.9
60-80,000	13	684	39.8	10	821	30.9	5	308	32.3
80-100,000	9	502	29.2	5	346	13.0	5	342	35.8
100-120,000	2	135	7.9	2	98	3.7	0	0	0
Total	32	1,718	100%	33	2,659	100%	15	954	100%
% College Education									
3-15	13	690	40.3	16	1,374	51.7	9	533	58
15-25	15	790	45.9	15	1,187	44.6	67	401	42
25-35	3	148	8.6	1	54	2.0	0	0	0
35-45	1	90	5.2	1	44	1.7	0	0	0
Totals	32	1,718	100%	33	2,659	100%	15	954	100%

of ethnic distribution and future analysis of these data, in conjunction with interviews and specific neighborhood studies, can be expected to define more precisely the character of the East Asian community.

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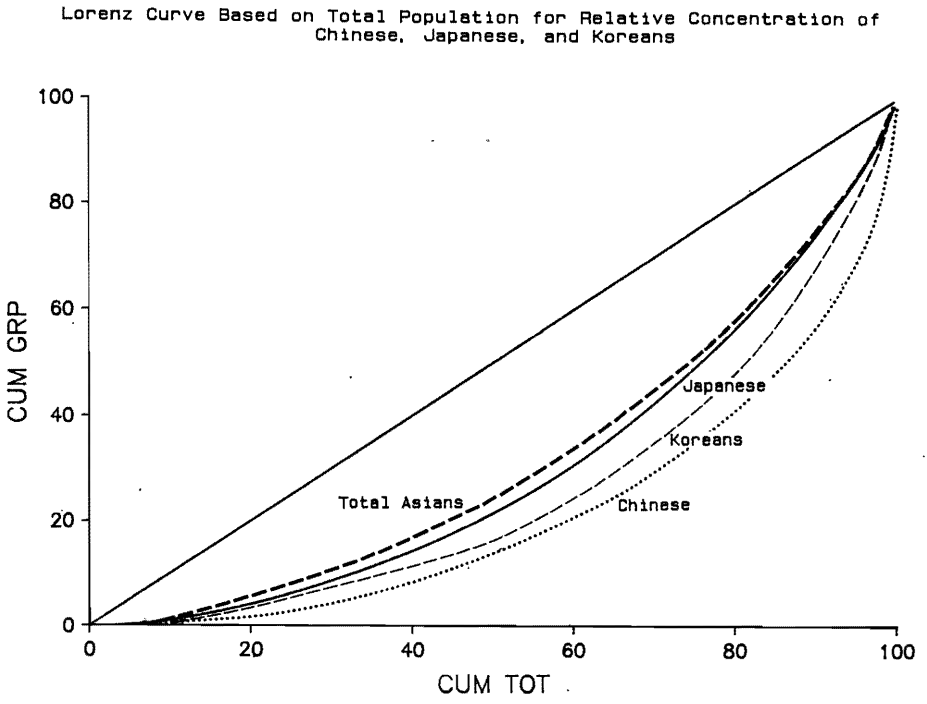

Figure 8.7: Relative density of Chinese, Japanese, and Koreans in Portland-Vancouver SMSA; the Chinese are most heavily concentrated (U. S. Department of Commerce, 1980).

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Chapter 9
Transportation Planning in the Portland Metropolitan Area

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The Portland Metropolitan area is considered a leader in transportation planning (Lee, 1977). Its downtown transit mall and fareless square are innovations which have received broad recognition (Dueker, et al, 1982). The recent integration of a light rail corridor into the mass transit system appears to be similarly successful. Yet, transportation planning in Portland is not marked by these physical elements alone.

The planning process was and is marked by strong citizen participation, a balance between public and private modes of transportation, and a use of transportation infrastructure to advance land use and development goals in the metropolitan area. Principal among the goals of the Downtown Plan developed in the 1970's was transforming a downtown on the verge of decay into a growing, vital center for the urban area. Development in the confined space of the downtown required good public transit access. Dependence on autos alone would have choked the city with congestion and air pollution. It would have meant exorbitant expenditures on additional freeways and continued transportation support for the development of suburban centers. Hence, the necessity of a balanced policy was clear in the minds of planners and decision makers. From this recognition flowed the mall, Fareless Square, and Light Rail development. A metropolitan area transportation plan focused on the downtown was initiated and has moved forward through many milestones. Portland was not unique, however, downtown goals dominated the urban transportation planning process in many cities (Adler, 1986).

As the city moves through the eighties into the nineties, questions about planning processes and their outcomes inevitably emerge. Can a plan oriented to centralization function effectively in an urban area subject to ongoing decentralization forces? Is the present and envisioned infrastructure appropriate to the needs and desires of the current and future population of the region? Are the issues of environmental awareness and energy efficiency, which reinforce the use of transit, as critical in the next decade as they were in the past two? In short, can an ambitious effort to insure the dominance of a central business district in the metropolitan region survive new realities? And, given the great investment Portland has made to that end, if it doesn't work here can it work anywhere? This paper attempts to give at least one perspective on answers to these questions.

PORTLAND'S TRANSIT SYSTEM - THE RESULT OF A FREEWAY REVOLT

As in most cities, Portland did not always move people primarily by automobiles, nor was its transit principally provided by buses. Arriving in Portland in 1912 one would have found an extensive system of streetcars and interurban trains, approximately 180 miles of them. On average, every mile of every run had 6.8 passengers using it. By this criteria, streetcar transit was at its ascendancy in that year (Labbe, 1980). In a Portland with a population of approximately 260,000, nearly 90,000,000 trips were taken on the rail system in 1912. Use of all other modes of transit was minor by comparison. There were some automobiles, a few jitneys, and no buses.

The first buses, four of them, came in 1924 with routes on the east side of the Willamette River. Trolley buses (coaches) were added in 1936. The last streetcar went out-of-service in 1950, and the few remaining trolley coaches ended service in 1958 (Sebree and Ward, 1974). By 1969, the year the current regional transit authority, Tri-Met, began operation, ridership had dropped to 16 million trips on a fleet of 205 buses. At that time major freeway investments were under consideration. The Mt. Hood Freeway, a major East-West corridor between downtown Portland and the growing eastern suburbs and satellite towns of East Multnomah county, was the immediate focus of interest. The current transportation system emerged from actions which ultimately led to withdrawing that proposed freeway. An understanding of what took place starts with insights into the geography, transit market, and political processes in the metropolitan area in the 1970's.

THE GEOGRAPHIC CONTEXT

The Portland SMSA is made up of four counties, Washington, Multnomah (containing Portland), and Clackamas Counties in Oregon and Clark County in Washington (Figure 9.1) Portland is generally flat on the east side of the Willamette River with a strong grid street pattern. Bordering the CBD to the west, the Tualatin mountains form a strong physiographic barrier and rise to an elevation of approximately 1,000 feet (Roberts, 1986).

The decade of the 1970's was a time of growth for the Portland SMSA as a whole. Population went from 1,000,129 to 1,242,594, an increase of 24.24 percent. The suburban counties of Washington, Clark, and Clackamas grew 55.7, 45.7 and 49.6 percent respectively, while the city of Portland lost 4.2 percent in population. Multnomah County, which includes the city, grew only 1.1 percent (Roberts, 1986).

The Portland SMSA exhibits many of the population and employment decentralization trends identified at the national level (Fulton, 1986). Portland's suburban areas are and were growing at a faster rate than the central city in both population and employment. Portland exhibited a decline in central city population, a trait commonly found in larger eastern cities (Roberts, 1986).

While the total number of potential transit riders was increasing in the SMSA, the "choice riders" were gravitating to the suburbs while "captive riders," the elderly and those with low incomes, were concentrating in the central city. The central city needed blanket coverage with a generally accessible mode of transit, i.e. buses, and the choice riders in suburbs needed to be lured onto attractive transit for a commute (Roberts, 1986).

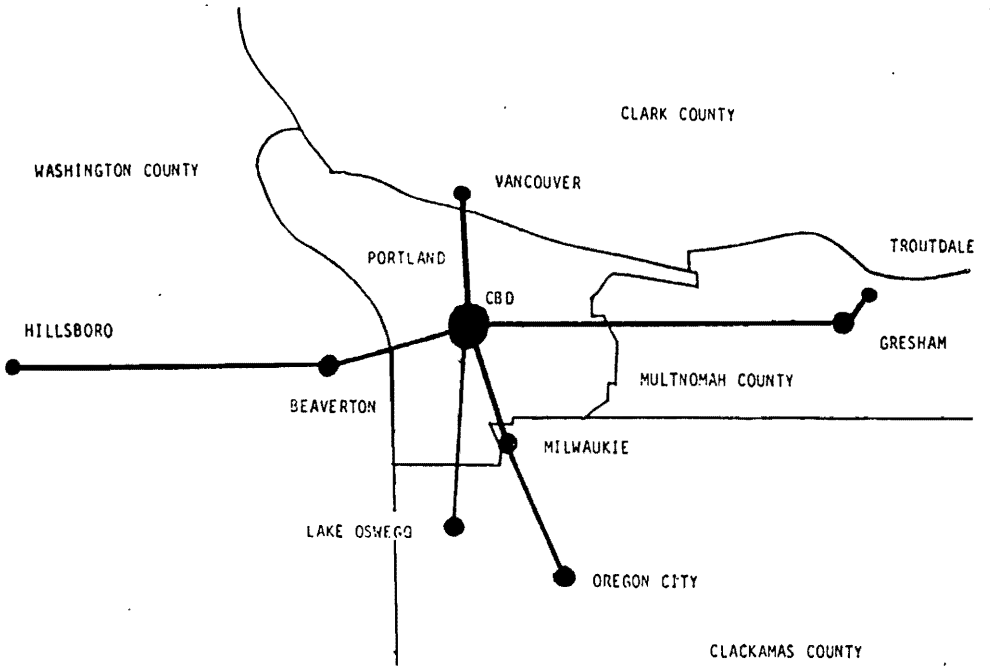

Figure 9.1 Counties of the Portland SMSA with suburban cities and major travel corridors (scale: 2 inches equal 5 miles).

THE GOVERNMENTAL PLAYERS

Several governments and their leaders had interests in the transportation planning process. At the time of Tri-Met's formation, the Metropolitan Service District (Metro), then known as the Columbia Region Association of Governments, was functioning as the Metropolitan Planning Organization (MPO) for the SMSA. The MPO is still housed there. Given that the MPO is the organization which functions as the clearing house for all transportation programs involving intergovernmental cooperation and federal funds, it is the arena in which local transportation planning battles are eventually fought. Metro is a regional government, while CRAG was a council of governments. Voting rights in the council were allocated largely on population criteria. Hence, the larger jurisdictions, e.g., the City of Portland and Multnomah County, could strongly influence the decisions of the MPO on the region's Transportation Improvement Plan (TIP).

In the 70's, the then Mayor of Portland, Neil Goldschmidt, mobilized a movement to create a greater role for transit in the metropolitan area, in large part to insure a viable downtown. Multnomah County Commissioners Mel Gordon and Don Clark supported this interest. They were concerned with an overemphasis on the highway transportation planning process. Clark and Goldschmidt provided the critical leadership, despite the absence of existing technical substantiation, to persuade the Governor to convene a Blue Ribbon Task Force to investigate transportation in the metropolitan area.

A Governor's Task Force (GTF) existed from 1972-1975, producing a

major report which set the technical systems context for subsequent transportation planning. The GTF was charged with evaluating transit alternatives for the region and identifying possible corridors. Five principal corridors were finally evaluated. The report concluded that the choice of mode should be based on factors other than simple ridership. These included flexibility, adaptability and environmental effects.

During this period the Oregon Department of Transportation (ODOT) and Tri-Met, the principal transportation agencies, had very different roles and responsibilities. ODOT was the highway agency. Its agenda diverged from that of the two principal local governments in the region. Utilizing a neighborhood highway revolt against the proposed Mt. Hood Freeway, Portland and Multnomah County were able to impede the highway emphasis of ODOT and persuade it to reconsider transportation options for the metropolitan area. As the agency with the greatest transportation technical strength, albeit highway-oriented ODOT was a necessary participant in transportation decision making. Only during the last part of the 1970's when the transit alternatives were fixed parts of the transportation system did it become a willing supporter of reduced highway systems.

Tri-Met, during this period, was a weak player in the decision system. Created in 1969, it lacked the institutional strength and capacity to make an effective contribution to the transportation revolution. Preoccupied with resurrecting and efficiently managing a formerly private bus system, it had little in-house planning expertise. Indeed, a former Tri-Met official characterized the agency as "unable to site a bus shelter" at that time. As the change in transportation systems unfolded during the decade, Tri-Met began to realize that it would be left to operate the transit component of the newly developed program, regardless of what that component was. Spurred by a need to insure its role in the decision process and not wanting to be left with a white elephant it couldn't operate, Tri-Met established its position in the decision process by commissioning a Light Rail Transit feasibility study and the 1990 Transit Plan. The result was the assertion of Tri- Met's role and the subsequent development of its staff and technical capacity. It was not, however, until the end of the decade that the agency assumed any real leadership in the process.

Transportation planning in the early and middle 1970's was dominated by the City of Portland and Multnomah County because of their superior technical capacity and control of the MPO for transportation. Only the initiation of light rail construction allowed Tri-Met the opportunity to assume equal status. Yet this dominance was not, in itself, the critical factor in the institutional landscape of transportation planning in that period.

The glue which held the region together through a major shift in transportation emphasis was a "pot-of-gold" in the form of withdrawal of the Mt. Hood Freeway from the Interstate system. Freeing up about $200 million in interstate substitution funds, this withdrawal supported the common interest around which the new regional transportation system was designed. The monies were used for 140 highway and transit projects, including the Banfield Transitway (highway improvements and light rail line). These projects were spread throughout the region and used by Metro to cement a regional consen-

sus which overcame substantial federal opposition to the Light Rail (Edner, 1985).

THE CURRENT CLIMATE AND PRESSURES FOR CHANGE

According to Altshuler (1979), three factors are needed for a substantial shift in public policy -- a crisis, a movement and a leader. All three factors were present in Portland in the 1970's in the form of an energy crisis, both an environmental and an inner city revitalization movement, and Mayor Neil Goldschmidt. Portland is widely recognized as an innovator because substantial shift in transportation policy did occur.

The freeway revolt in Portland took place in an era of heightened environmental awareness. This awareness included the concept of urban growth management as part of Oregon's statewide land use planning process (Edner, 1985). In Portland this meant urban growth containment and the use of transportation investments to achieve higher land use densities and greater dependency on transit. Conventional wisdom within urban growth management was that sprawl could be stemmed. Nationally, as well as locally, it is evident that transportation plans to support growth containment have not slowed decentralization (Fulton, 1986; Roberts, 1986). The region is currently faced with the task of rethinking transportation policies and plans that are based on strategies to centralize population. This is not occurring.

Second auto ownership is increasing nationally and locally. Unless drastic macroeconomic or new petroleum based disruptions occur, it is likely to continue to increase. The fastest growing, and as yet largely untapped transit market is that of the inter- and intra-suburban commuter. It is unlikely that conventional fixed route bus or rail service will be able to attract a substantial share of this travel market. The type of transit service extended to this market must be able to compete favorably with the auto in terms of travel time and convenience. With the abundance of free parking and ease of auto accessibility in suburban areas, innovative strategies will be necessary to increase transit's share of this market.

Third, Portland's transit system is heavily CBD-oriented. This market is currently quite strong and any immediate downturn in the CBD market is not expected. However, it is unlikely to grow; expansion potential in the transit market will be in the suburban areas (Roberts, 1986).

PRESENT ISSUES

The energy crisis and environmental movement have faded in the public consciousness. The new crisis is one of government finance and the effects of tax limitation and privatization or public and quasi-public services. In the Portland metropolitan area there is a so-called "leadership gap". The region is awaiting someone to propose innovative solutions to build the coalitions necessary to implement those solutions.

Mass transit was widely believed to be the way to achieve the land use and environmental goals of the 1970's (Altshuler, 1979), and the necessary conditions for change were present then. Now transit does not seem to be capable of bringing about substantial change, nor is it clear what change is desired.

THE EMERGING PERSPECTIVE

The political and technical marriage that produced the Banfield light rail

transit project met the tests of political and technical feasibility. The technicians and politicians believed that the light rail transit would work, was cost effective, and would be the center piece of Portland's transit future. In retrospect, however, the decision took place in an evolving technological context. The expectations of the 1970's concerning transit's ability to solve land use, environmental, and energy problems were very high. These expectations have been tempered with greater recognition that such impacts are seldom or at best narrowly achieved.

The 1980's have brought many changes. There is mounting evidence that mass transit is not going to solve all urban ills (Jones, 1985). Transportation is no longer perceived to have the ability to shape urban form because it provides no accessibility advantages to riders (Meyer and Miller, 1984). Transit ridership began declining in 1981 and the subsidy needed for operations began rising (CWFF, 1985). The proportion of people who both live and work in suburbs in Portland grew from 35.5% in 1970 (slightly below the national average) to 42.3 percent in 1980 (slightly above the national average). At the same time auto ownership has increased with a definite trend towards one vehicle per licensed driver (Highway Users Federation, 1986).

Political leadership in the Portland area is diffuse. Portland may have dominated during the 1970's, but the long term trend towards suburban independence has returned in the 1980's (Abbott, 1983). Tri-Met's managers have been questioned because of overly optimistic forecasts and experiments with articulated buses and automated fare systems which were not totally successful (CWFF, 1985). Today the agency is going through an adjustment period with an entirely new board. The region's metropolitan planning organization, Metro has lost its lever to move transportation issues with the depletion of the Mt. Hood withdrawal funds. That source of glue for coalitions has been exhausted. At the same time the suburbs have reasserted their independence and transit has lost credibility, the auto and highway lobbies have reemerged. They assert that the most mobility for dollars is gained with highways, not transit systems. Transit systems are only needed to assure basic mobility (Highway Users Federation, 1986). The philosophy that transportation should follow rather than lead land use and demographic trends is reemerging with these lobbies.

THE FUTURE OF TRANSPORTATION PLANNING IN THE REGION

It appears that public transportation will play a more reactive than a preactive role in the future. Meanwhile, highways are being re-emphasized as an important element of economic development for the region. State legislation now allows the ODOT to invest in off-(State) highway system improvements that promote economic development. Counties and cities are competing for the same economic development projects and are each requesting state aid for their jurisdiction. The current financial glue seems to favor random and diversive system extension. A coalition for major, concerted efforts seems unlikely.

Portland has achieved considerable recognition for the success of central area and radial transportation investments that have strengthened the downtown. Yet urban development trends are not easily swayed, and the region faces the problem of serving a dispersed development pattern. The fai-

lure of the land use-transportation interactions to occur as expected raises important implications concerning the reversibility of long term decentralization and reactive transportation system development. Portland was, in effect, fighting the continued trend toward suburbanization. Yet, recent thinking challenges the likelihood of reversing this trend. Altshuler (1979) observes that growth along transit lines since the pre-1920 era is largely unrelated to the proximity of transit. There is evidence that suburban growth is more efficient than planners once believed (Altshuler, 1979, Fulton, 1986), and that decentralization may be a more rational direction for growth than high density urban development. Further, there is no indication of a future decrease in private automobile use. This new evidence suggests that Tri-Met, and other transit agencies, may have misassessed the impetus and consequences of decentralization and erred in attempting to reverse them.

The region's motivation to reverse long term trends in its planning may have been rooted in the pressure to use transit systems as economic development tools, to foster continued growth and investment in the urban core. Specifically, light rail transit in Portland was molded to serve a commuter ridership for economic development and environmental goals. A substantial cost to Tri-Met and the public was not closely considered.

Regardless of the origin of these development goals, Tri-Met has embraced them with the existing transit system, and used them as rationale for future expansion. Yet, evidence suggests that downtown growth-oriented transit projects, including radial line, articulated buses, the transit mall, and light rail transit, are delivering little additional investment stimulus. Growth along the downtown mall has not occurred at a faster rate than it would have without the project, and land values have not achieved a noticeable gain there (Dueker, 1982).

Thus, the principal successes of transportation planning in Portland are in achieving the construction and operation of a number of highly visible system elements. These will remain as the physical artifacts of the social movements, economic realities, and political interplay of the 1970's. The mall has added to the quality of the built environment in the downtown and the light rail seems initially successful in capturing downtown focus and some suburban/city commuting. Yet the overall trend of decentralization seems unaffected. Any success in this direction is, at best, minimal.

The bright success of the 1970's in institutional structures supporting political decision-making has faded. The institutions have changed, leadership has changed, the issue context has changed, and there are no pot-of-gold transfer funds to ease decisions on resource allocations. The true measure of the importance of the Portland experience to urban transportation will be taken in the next decade. The work of the last two decades will not serve the realities of the next two. Coalitions of a more diffuse power structure will likely emerge. Will they be able to develop strategies to provide a transportation system optimized to contemporary visions of transportation futures, and will those visions be accurate?

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Chapter 10
Economy of the Portland Area

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Portland has long been Oregon's dominant economic center. The city's importance stems largely from its location at the head of ocean-going navigation on the Columbia-Willamette River system. In the early years goods brought in by ship from the outside world were unloaded and hauled to growing settlements in the Willamette Valley. Agricultural products, in turn, were exported via Portland, mostly to California during the first few decades and later to mining areas east of the Cascades. Factors contributing to Portland's early economic growth have been summarized in detail by Merriam (1971) and Abbott (1985).

During the first 100 years after its beginning in the 1840's, Portland specialized in commercial activities. Although the city still has a strong commercial base, it has diversified considerably, especially since World War II. This diversity has helped Portland through the economic difficulties experienced by many communities in Oregon and elsewhere during the early 1980's.

The diversity of the Portland area's economy is reviewed in this chapter. Most of the discussion covers trends from the mid-1970's to the mid-1980's. An overview is first presented of the metropolitan economy, followed by summaries for each of the major sectors. Trends are summarized primarily for the greater Portland metropolitan area, which includes Clackamas, Multnomah, Washington, and Yamhill Counties in Oregon, and Clark County, Washington.

OVERVIEW OF THE PORTLAND AREA'S ECONOMY

Personal income in Oregon's portion of the Portland metropolitan area was about $11.4 billion in 1984, 114 percent more than in 1975 (Figure 10.1). Despite a decline in Oregon's economy during the recession of the early 1980's, personal income in the Portland area continued to grow. Throughout the latter half of the 1970's and early 1980's, more than 50 percent of Oregon's personal income was generated in the Portland area (Figure 10.2). It appears that the metro area is accounting for an increasingly larger proportion of the state's economy. This trend represents a reversal from more rapid growth in Oregon's nonmetropolitan areas during the latter part of the 1970's, and is similar to trends occurring at the national level (Daberkow and Bluestone, 1984; Bluestone and Daberkow, 1985; Kale, 1986).

The trade sector is more important in Portland's metropolitan area than nationally (Figure 10.3). On the other hand, the manufacturing and government sectors contribute less to the Portland area's economy than they do to the nation's. Manufacturing is the area's most important sector in terms of income, but follows trade and services in employment. This occurs because of higher wages in manufacturing than in the trade and services sectors.

The extent of diversification in Portland's economy can be measured

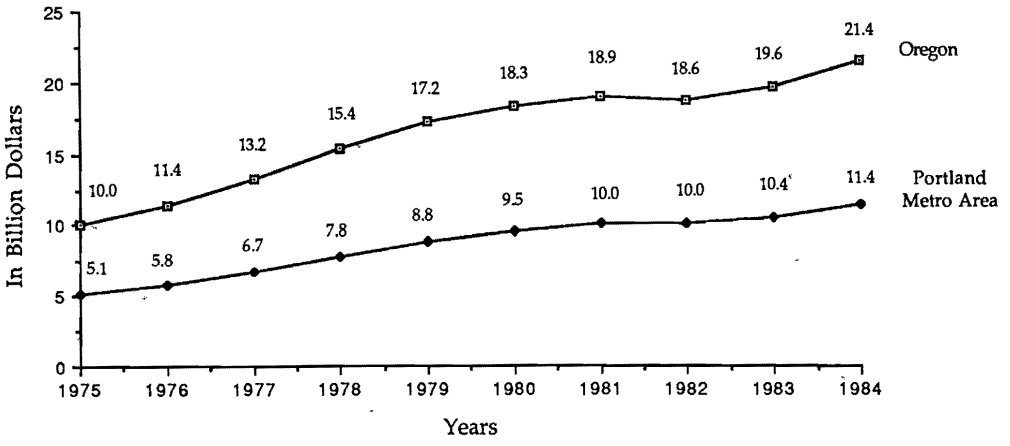

Figure 10.1 Personal income in Oregon and in the Portland metropolitan area, 1975-1984 (does not include Clark County, Washington) (U.S. Bureau of Economic Analysis).

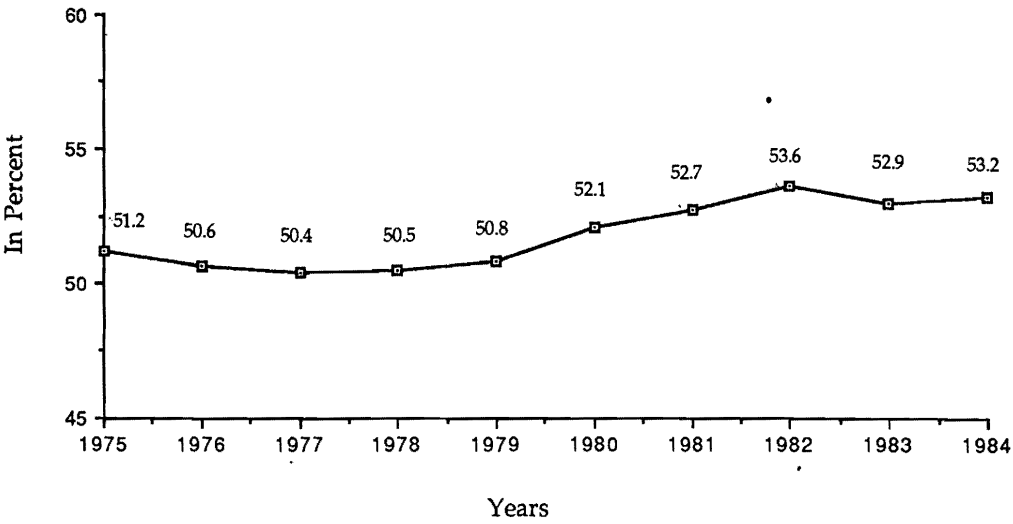

Figure 10.2 Proportion of Oregon's personal income generated in the Portland metropolitan area, 1975-1984 (U.S. Bureau of Economic Analysis).

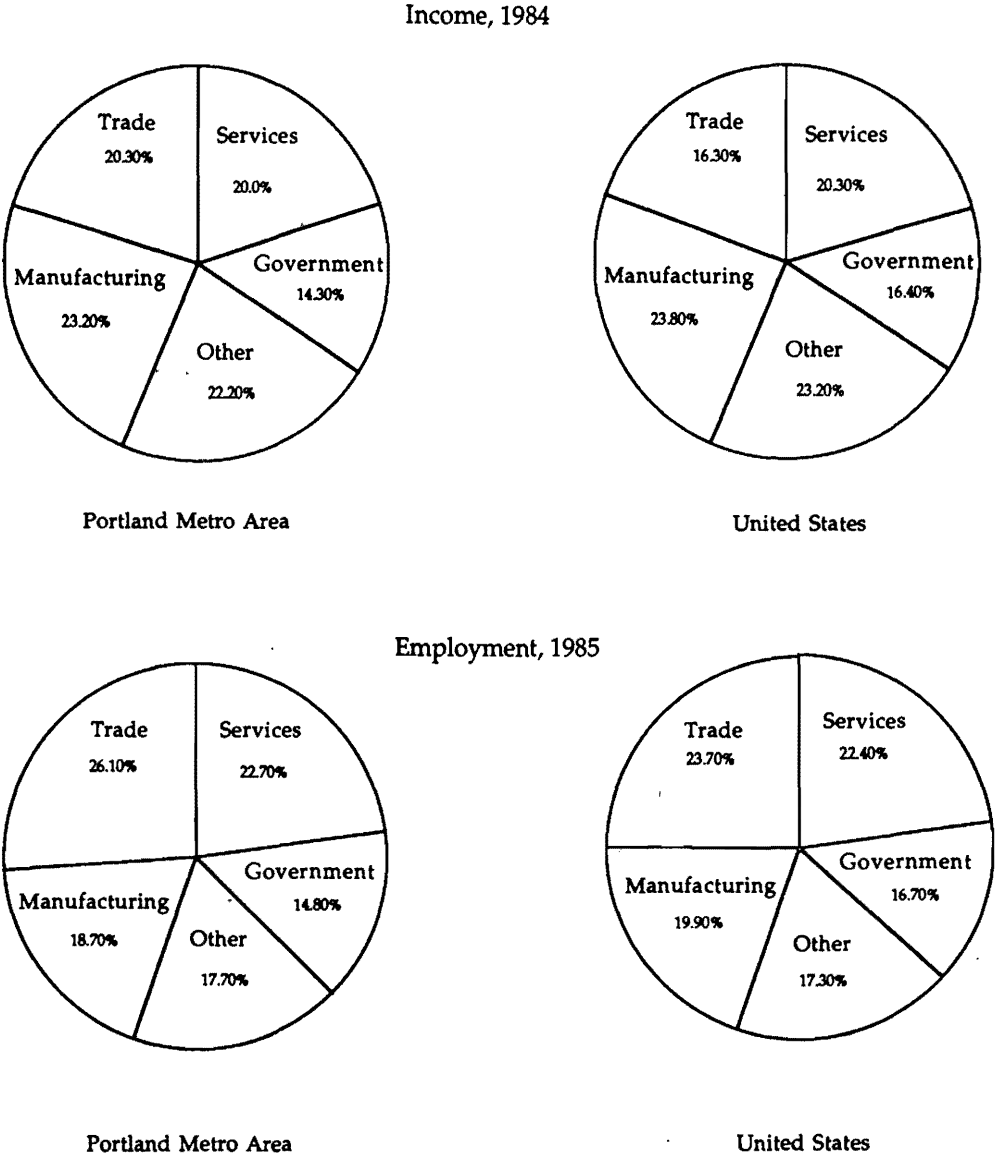

Figure 10.3 Proportion of the Portland and U. S. economies attributable to major sectors, selected years (U.S. Bureau of Economic Analysis; U.S. Department of Labor).

by comparing the metropolitan area's proportion of income or employment in a given sector to the nation's proportion of income or employment in the same sector. One measure based on such a comparison is the location quotient (Table 10.1). If a location quotient has a value of one, then the proportion of income or employment in a given sector is identical to the national proportion

Table 10.1: *Location quotients and indexes of specialization in the Portland metropolitan area, selected years (n.a. = not available) (U.S. Bureau of Economic Analysis; U.S. Department of Labor; Oregon Employment Division; Washington Employment Security Department).*

	Location Quotients					
	Income			Employment		
	1975	1980	1984	1975	1980	1985
Farm	0.50	0.56	0.72	n.a.	n.a.	n.a.
Agricultural Services, Forestry, Fisheries, Other	1.00	n.a.	1.00	n.a.	n.a.	n.a.
Mining	0.07	n.a.	0.13	n.a.	n.a.	n.a.
Construction	1.03	1.19	0.89	0.89	0.92	n.a.
Manufacturing	0.91	0.95	0.97	0.87	0.89	0.94
Transportation and Public Utilities	1.19	1.14	1.21	1.15	1.14	1.19
Trade	1.27	1.24	1.25	1.13	1.12	1.10
Finance, Insurance, and Real Estate	1.12	1.17	1.02	1.33	1.42	1.29
Services	1.04	0.99	0.99	1.08	1.02	1.01
Government	0.87	0.82	0.87	0.87	0.83	0.89
	Indexes of Specialization					
	Income			Employment		
	1975	1980	1984	1975	1980	1985
Portland Metro Area Compared to the U.S.	0.15	0.14	0.11	0.13	0.13	0.11

Note: Location quotients and indexes of specialization were calculated by comparing the Portland metropolitan area's proportion of income or employment in a given sector to the national proportion of income or employment in the same sector.

of less than one means that the Portland area is less specialized than the U.S. An area with location quotients near one for most sectors has an economy that is relatively diversified.

The coefficient of specialization is another measure of economic diversification. Coefficients of specialization can range from zero to one (Table 10.1). The closer a coefficient of specialization is to zero, the more diversified an area's economy is. The closer a coefficient of specialization is to one, the more specialized an area's economy is in only a few sectors.

Location quotients are greater than one for transportation and public utilities (TPU); trade; finance, insurance, and real estate (FIRE); and services (Table 10.1). The farm, mining, construction, manufacturing, and government sectors have location quotients of less than one. Location quotients thus confirm that the Portland metropolitan area continues to focus more on commercial activities than on manufacturing and other more traditional basic activities. Nonetheless, location quotients do not

vary much from a value of one in any sector except mining, indicating that Portland's economy is relatively diversified.

This diversification is supported further by the indexes of specialization in the Portland area. These indexes are not much greater than zero, which would be the highest level of diversification possible. Moreover, decreases in indexes of specialization during the last 10 years suggest that the Portland economy is becoming even more diversified.

PRIMARY ACTIVITIES

Timber

Oregon leads the nation in timber production. Competition from companies in Canada and the southern United States has reduced Oregon's role in recent years, but the state likely will continue to be important in the manufacturing of wood-based products, especially those made from fir and other softwoods, through the remainder of this century.

Most of the forests in the immediate Portland area have been replaced by urban, agricultural, and other uses. The eastern portion of the Portland metropolitan area, however, has substantial timber reserves in the Mt. Hood National Forest. Part of this area is vital to Portland's water supply (Bull Run Watershed) and there are growing concerns about inter-relationships between timber-harvesting practices and water availability and quality.

Portland leads all other Oregon ports in the export of softwood logs. In 1985, over 361 million board feet were exported through Portland (Warren, 1986, 19). This total represented 47 percent of Oregon's exports of softwood logs. Timber harvested near Portland also is processed into wood products or paper at numerous facilities in the metropolitan area.

Agriculture

Oregon's four counties in the Portland metropolitan area accounted for 21 percent of the state's agricultural sales in 1986 (Oregon State University, 1987). This rather sizable production is based on the demands of the greater metropolitan area, and on physical factors enabling the cultivation of a variety of crops. Specialty horticultural crops contribute the most to production, but vegetables and truck crops, small fruits and berries, eggs and poultry, and dairy products also are important (Figure 10.4). The most productive agricultural areas are in Clackamas and Washington Counties, where over two- thirds of the total sales occurred in 1986 (Figure 10.5).

Mining

Oregon is a relatively insignificant producer of minerals. In 1984, the state

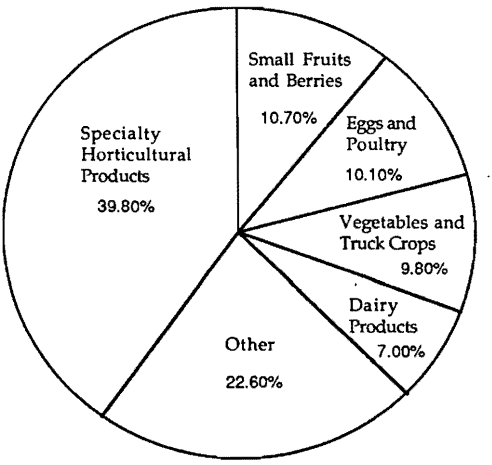

Figure 10.4 Proportion of the Portland area's farm production sales attributable to various commodities, 1986 (Oregon State University, 1987).

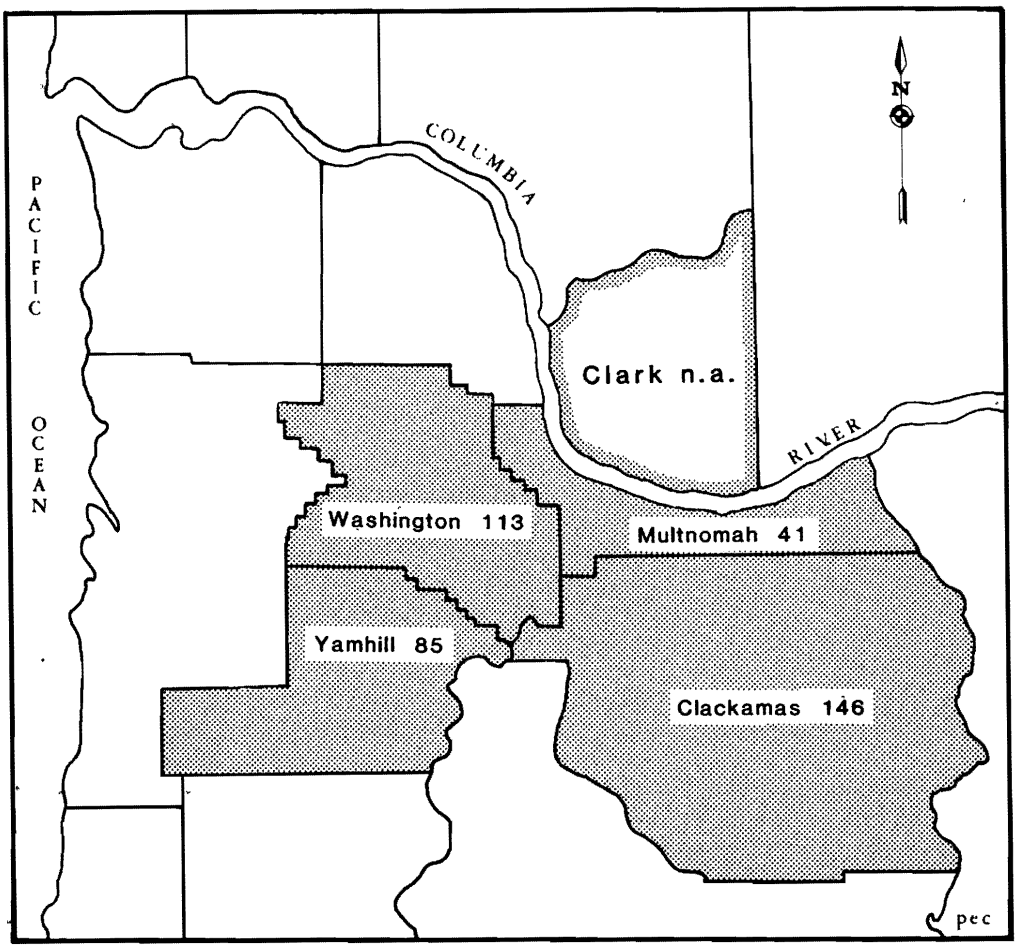

Figure 10.5 Farm sales in millions of dollars by county in the Portland metropolitan area, 1986 (Oregon State University).

ranked 37th in the value of non-fuel mineral production, and only 0.5 percent of the nation's total was attributable to Oregon (U. S. Bureau of Mines, 1986, p. 5). Multnomah County is Oregon's leading producer of minerals. Although reported data are incomplete, it appears that 15 to 20 percent of Oregon's non-fuel mineral production in 1982 was attributable to the Portland metropolitan area (Babitzke and Brooks, 1986, p. 490). The most important products were lime, crushed stone, sand and gravel, and clays.

CONSTRUCTION AND MANUFACTURING

Construction

During the 1970's, rapid population growth in Oregon stimulated expansion of the construction sector. The recession of the early 1980's severely affected this sector, and many construction workers in Oregon lost their jobs. In the Portland metropolitan area, employment in construction decreased by about 39 percent

between 1979 and 1982. Since 1982, employment has recovered somewhat, but there were still fewer employed construction workers in 1985 than in 1979.

The top 15 projects in the Portland area in 1986 represented an investment of nearly $970 million, over half the value of Oregon's 50 largest construction projects (Table 10.2). Most of the projects in the Portland area consisted of the construction of commercial, governmental, industrial, medical, and residential buildings.

Manufacturing

In 1985, manufacturing was the Portland area's leading employer and the most important generator of personal income. Despite this contribution, the manufacturing sector is becoming a less significant employer in the metro area: from 1975 to 1985, manufacturing's share of total employment decreased from 20.7 percent to 18.7 percent. In terms of personal income, however, manufacturing's share increased slightly -- from 22.9 percent of total income in 1975 to 23.2 percent in 1984. Discrepancies between trends in employment and trends in income reflect the high wage levels of manufacturing in comparison to wage levels in other sectors. Although employment is growing more rapidly in service-producing sectors, wages in these sectors are generally

Table 10.2: *Fifteen largest construction projects in the Portland metropolitan area, 1986 (Oregon Business, 1987).*

Project	Location	Investment ($ millions)	Scheduled Completion
Kruse Woods Office Park	Lake Oswego	250	n.a.
Veterans Administration Hospital	Portland	110	1990
RiverPlace, Phase II	Portland	83	1992
Roseway Industrial Center, Phase I	Hillsboro	70	1990
Waterhouse Housing Development	Beaverton	68	1988
One Financial Center	Portland	55	1987
BPA Headquarters Building	Portland	54	1987
Twin Oaks	Washington County	54	1989
Port of Portland Cargo Facility, Terminal Two	Portland	46	1987
Cornell Oaks Corporate Center	Washington County	40	1987
Sterling Pointe Apartments	Beaverton	35	n.a.
Montgomery Park	Portland	30	1987
Quad 217 Corporate Center	Beaverton	25	n.a.
Oregon Graduate Center Science Park	Beaverton	25	n.a.
Good Samaritan Medical Plaza	Portland	24	1987

much lower than in manufacturing. Increases in employment for the services sectors have not generated enough personal income to improve the overall position of these sectors relative to manufacturing.

Electronics and instruments companies are the leading manufacturing employers in the Portland area (Figure 10.6). Factors contributing to trends in these high-technology sectors are discussed in Chapter 12. No other sector accounts for as much as 15 percent of total manufacturing employment in the metropolitan area.

Importance among manufacturing sectors varies within the region. In 1983, the leading industrial grouping in each county was as follows: Clackamas -- non-electrical machinery, Multnomah -- food products, Washington -- instruments, Yamhill -- timber products, and Clark – paper products (U.S. Department of Commerce, 1985). Multnomah is the most diversified, with approximately 9 to 12 percent of total 1983 manufacturing employment in each of the following six sectors: food products, printing and publishing, primary metals, fabricated metals, non-electrical machinery, and transportation equipment.

Two-thirds of Portland's manufacturers have located in the area since World War II (Table 10.3). By far the largest manufacturer is Tektronix, which was begun in the late 1940's. Another three of the 15 largest manufacturers -- Intel, Floating Point, and Electro-Scientific Industries -- also are high technology companies. Nike, Jantzen, and Pendleton -- three nationally known makers of apparel and footwear – have headquarters in the Portland area.

The Portland area's major industrial

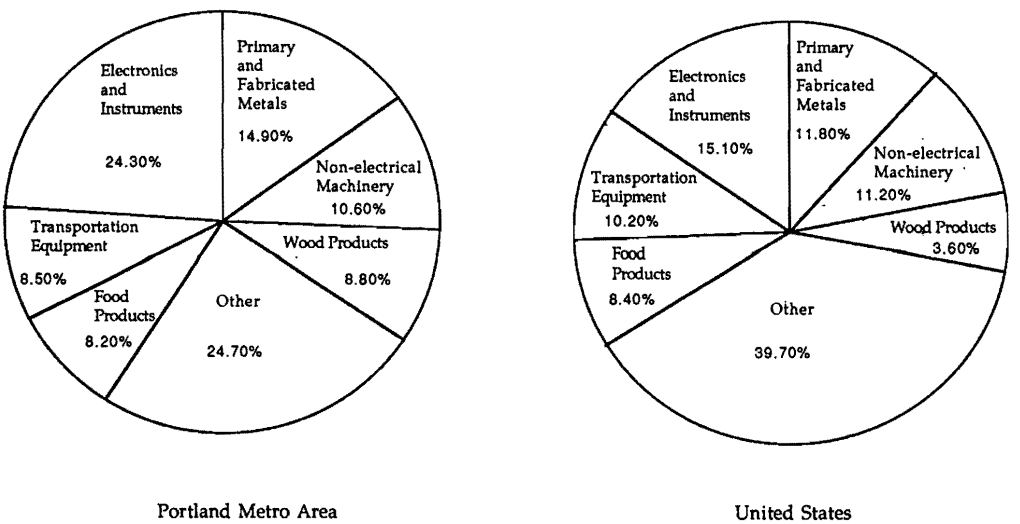

Figure 10.6 Proportion of manufacturing employment attributable to major sectors, Portland and the U.S., 1985 (U.S. Department of Labor).

Table 10.3: *Fifteen largest manufacturing employers in the Portland metropolitan area, May, 1986 (Paglin and Inskeep, 1986, pp. 7-9).*

Employer	Number of Employees	Year Established in Portland	Type of Product
Tektronix	14,500	1946	Instruments, Electronics
Crown Zellerbach Corporation	4,800	1884	Pulp and Paper Products
Intel Corporation	4,300	1968	Electronics
Freightliner Corporation	3,000	1947	Trucks
Precision Castparts	2,400	1953	Metal Casting
Nike, Inc.	1,450	1972	Footwear, Apparel
Jantzen, Inc.	1,300	1910	Sportswear, Swimwear
Boeing of Portland	1,250	1974	Aircraft Components
Floating Point Systems	1,250	1970	Computing Equipment
Esco Corporation	1,200	1913	Steel Casting
Omark Industries, Inc.	1,100	1947	Saw Chains, Power Tools
Pendleton Woolen Mills	1,100	1909	Apparel
Oregonian Publishing Company	1,050	1850	Newspapers
Reynolds Metals Company	950	1946	Aluminum
Electro-Scientific Industries	900	1953	Electronics

sites are shown in Figure 10.7. Heavy manufacturing is concentrated in areas along the Willamette River below downtown Portland, especially in the Swan Island and Rivergate industrial districts. Several large manufacturing plants (for example, Esco Corporation, Jantzen, OECO Corporation, and Omark Industries) are located in industrial areas near downtown Portland. The West and East Columbia Industrial Districts near the Portland International Airport are among several areas being more intensively developed. Perhaps the highest level of activity is occurring in Hillsboro, Beaverton, Tigard, and Wilsonville. Most of Portland's high technology companies are located in these areas, and numerous facilities have been built to accommodate recent and anticipated growth.

SERVICES-PRODUCING SECTORS

Trade, services, and government are the largest tertiary sectors in the Portland area (Figure 10.8). Trade, finance, insurance, and real estate (FIRE); and transportation and public utilities (TPU) account for a larger proportion of employment in the Portland area than they do nationally. Services and government are relatively less important for the Portland area than for the U. S. as a whole.

Within the trade sector, retail trade employed about 83 percent of the 1983

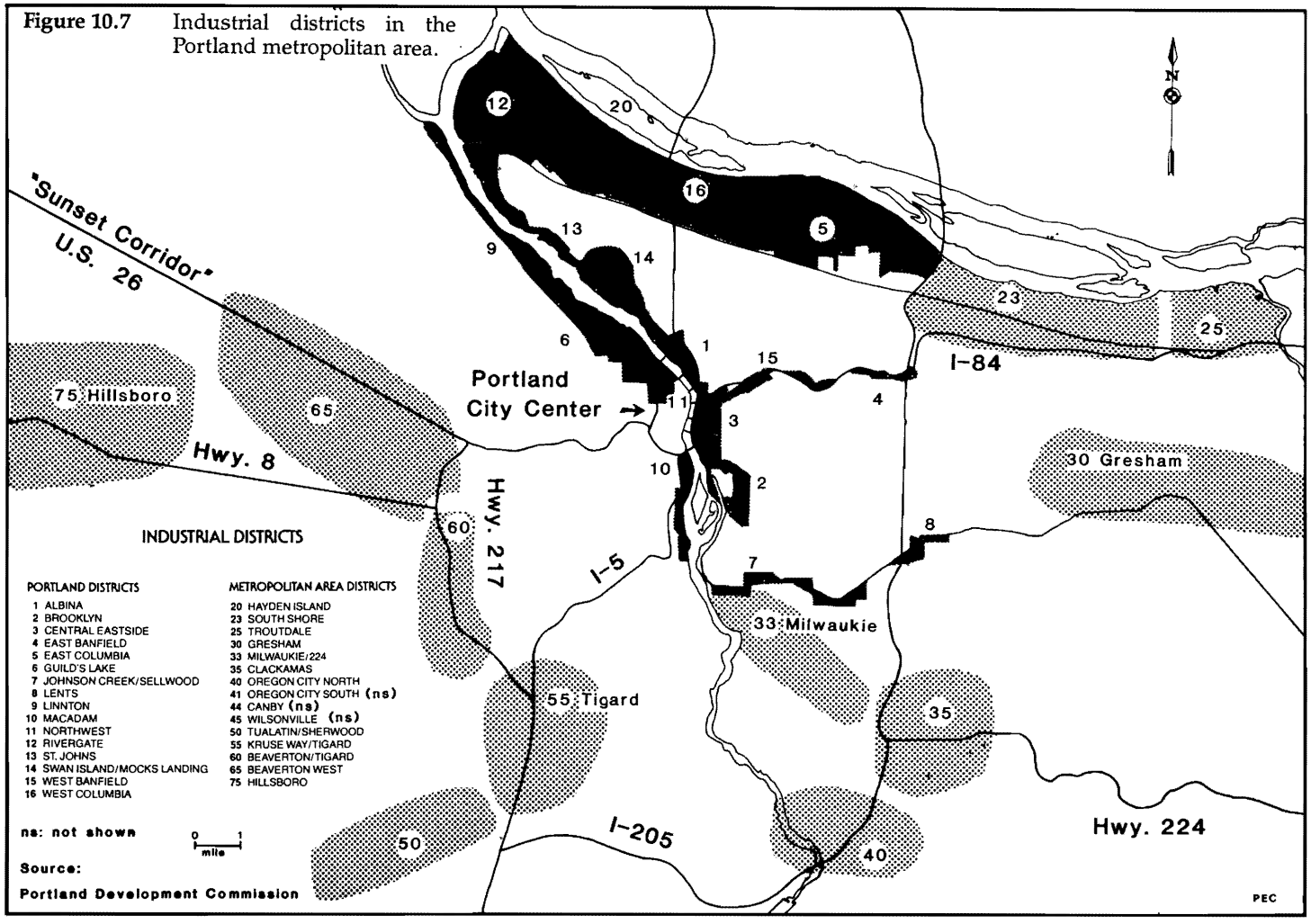

Figure 10.7 Industrial districts in the Portland metropolitan area.

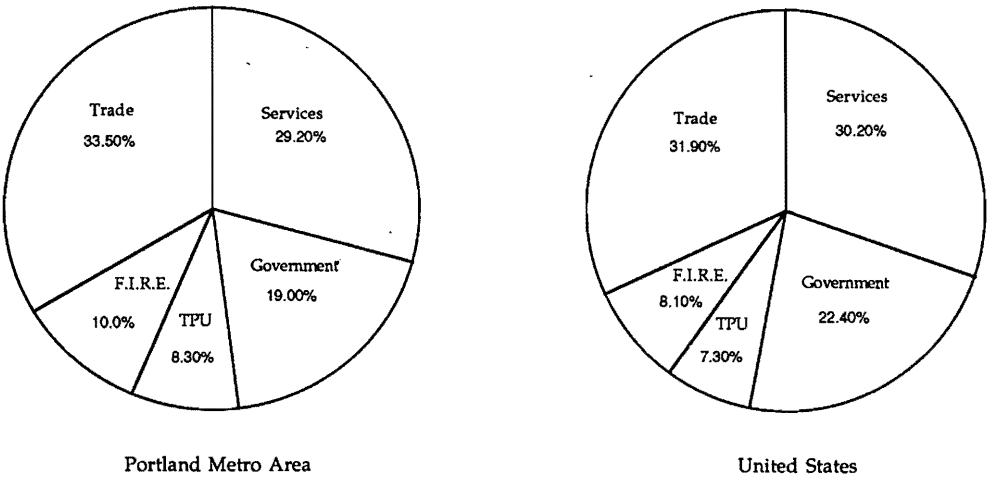

Figure 10.8 Proportion of service employment attributable to major sectors, Portland and the U.S., 1985 (U.S. Department of Labor).

total; 17 percent was attributable to wholesale trade (U. S. Department of Commerce, 1985). During the same year, one-third of the service sector's employees worked at hospitals, doctors' offices, and other health-related establishments, and 16 percent worked in business services. Local government employed more than state or federal governments, and education was the most important local-government employer.

Although transportation and public utilities and finance, insurance, and real estate do not employ as many persons as trade, services, and government do, they nonetheless account for five of the 15 largest services-producing businesses in the Portland area (Table 10.4). The significant contribution of health services to the regional economy is illustrated by the four hospitals (Table 10.4). Fred Meyer and Meier and Frank, two well-known retail stores in the Pacific Northwest, have headquarters in the Portland area, as does Red Lion Motor Inns. Although not included in Table 10.4, the federal government is also a major employer, especially the U.S. Department of Energy's Bonneville Power Administration, whose headquarters are in Portland.

TRAVEL AND TOURISM

Revenues from travel and tourism contribute substantially to the economy of Portland. There are numerous recreational opportunities available and the city hosts several heavily attended annual festivals. Like most large metropolitan areas, Portland has a symphony orchestra, a zoo, several theater companies, museums, and a team in the National Basketball Association.

Estimates of impacts from travel and tourism in the Portland area and elsewhere in Oregon have been made by the U.S. Travel Data Center (1986), which defines travelers as persons making an overnight trip, or making a one-day trip in which they went 100 miles or more away from home. The Travel Data Center's estimates do not include impacts from foreign students away at school. Additionally, the estimates mea-

Table 10.4: *Fifteen largest services-producing employers in the Portland metropolitan area, May, 1986 (Table does not include public-sector employers) (Paglin and Inskeep, 1986, pp. 7-9).*

Employer	Number of Employees	Year Established in Portland	Type of Business
Fred Meyer	5,200	1923	Retail Store
U. S. Bancorp	4,150	1891	Bank and Holding Company
Kaiser Permanente	3,650	1942	Hospital
Pacific Northwest Bell	3,600	1878	Telephone Utility
Metropolitan Hospitals	3,500	1971	Hospital
Portland General Electric Corporation	3,150	1889	Electric Utility
First Interstate Bank of Oregon	2,950	1865	Bank
Meier and Frank Company	2,750	1857	Department Store
Good Samaritan Hospital and Medical Center	2,550	1875	Hospital
Thunderbird/Red Lion Motor Inns	2,400	1959	Lodging
Safeway Stores, Inc.	2,200	1926	Grocery Chain
St. Vincent Hospital and Medical Center	2,150	1875	Hospital
PacifiCorp	2,000	1910	Electric Utility, Resource Development, Telecommunications
Providence Medical Center	1,800	1941	Hospital
Nordstrom	1,500	1950	Retail Store

sure only the direct impacts from travel, and do not include direct and indirect impacts created via the multiplier process. Their estimates in 1985 indicate that, more than $1.2 billion in expenditures directly related to travel were generated in the Portland area (U.S. Travel Data Center, 1986). These expenditures were responsible for approximately 27,200 jobs, 46 percent of all travel-related jobs in Oregon, and for $39.3 million in state and local tax receipts. Impacts from travel and tourism probably were greatest for the trade and services sectors, especially for restaurants, grocery stores, gasoline stations, and lodging establishments.

THE ECONOMIC FUTURE OF THE PORTLAND AREA

Portland's economic future appears bright. Within Oregon, the Portland area will remain dominant, and if recent trends continue, the region will gain an increasingly larger share of the state's economy. This does not mean that Portland will be able to avoid economic stress. There will undoubtedly

be major companies that close, move from the area, or lay-off employees. Georgia-Pacific, Hyster, White Stag, and several high technology companies are recent examples. On the other hand, new companies will begin locally or move to the area. The December 1986 decision by Albertson's to open a grocery-distribution facility in Gresham on the east side of Portland illustrates a recent success. This facility is projected to employ 350 persons initially, and as many as 800 within 10 years (Goranson, 1986).

Economic projections further support the contention that Portland's economy will do well in the future. The Oregon Employment Division projects that much of the state's future employment growth will occur in the services sector (Tables 10.5 and 10.6). Altogether, services are projected to account for about 40,700

Table 10.5: *Oregon's 20 fastest growing economic sectors in percentage terms, 1984-92 (Source: Oregon Employment Division).*

	Standard Industrial Classification (SIC)	Employment 1984	Employment 1992	Percent Change
73	Business Services	31,339	45,730	45.9
47	Transportation Services	2,942	3,905	32.7
17	Special Trade Contractors	16,707	21,850	30.8
54	Food Stores	27,859	35,790	28.5
37	Transportation Equipment	8,461	10,840	28.1
15	General Building Contractors	7,189	9,150	27.3
62	Security, Commodity Brokers, and Services	1,981	2,500	26.2
83	Social Services	13,355	16,800	25.8
51	Wholesale Trade -- Nondurable Goods	26,620	33,100	24.3
79	Amusement and Recreation Services	7,564	9,350	23.6
81	Legal Services	7,058	8,700	23.3
76	Miscellaneous Repair Services	3,349	4,090	22.1
30	Rubber and Miscellaneous Plastic Products	2,809	3,411	21.4
39	Miscellaneous Manufacturing Industries	2,594	3,140	21.0
42	Trucking and Warehousing	18,185	21,980	20.9
89	Miscellaneous Services	9,751	11,650	19.5
70	Hotels and Other Lodging Places	13,985	16,680	19.3
07	Agricultural Services	4,184	4,980	19.0
45-46	Air Transportation and Pipelines	2,204	2,620	18.9
63	Insurance Carriers	12,127	14,383	18.6
	TOTAL	220,263	280,649	27.4

additional jobs -- one-third of net growth in employment -- from 1984 to 1992. Business services is projected to be the fastest growing sector in net terms as well as in percentage terms, and will contribute about 12 percent of the net new jobs.

Most of the other sectors listed in Tables 10.5 and 10.6 are well represented in the Portland area. As is the situation nationally, only a few manufacturing sectors are listed. High-technology manufacturing, in particular, is conspicuously absent from either table of fastest growing sectors. This suggests that rapid growth experienced by Portland's high technology companies in the 1970's and early 1980's may not be repeated during the latter 1980's (but see Chapter 12).

Economic projections suggest that Portland will remain an important commercial center. It does not appear that any one or two sectors will dominate

Table 10.6: *Oregon's 20 fastest growing economic sectors in net terms, 1984-92 (Oregon Employment Division).*

	Standard Industrial Classification (SIC)	Employment 1984	Employment 1992	Net Change
73	Business Services	31,339	45,730	14,391
80	Health Services	67,476	77,259	9,783
58	Eating and Drinking Places	67,568	76,100	8,532
54	Food Stores	27,859	35,790	7,931
51	Wholesale Trade -- Nondurable Goods	26,620	33,100	6,480
	Local Education	70,531	76,530	5,999
17	Special Trade Contractors	16,707	21,850	5,143
50	Wholesale Trade -- Durable Goods	38,144	43,100	4,956
	Other Local Government	42,683	46,874	4,191
42	Trucking and Warehousing	18,185	21,980	3,795
83	Social Services	13,355	16,800	3,445
	Federal Government	29,071	32,100	3,029
	Other State Government	28,748	31,745	2,997
70	Hotels and Other Lodging Places	13,985	16,680	2,695
35	Machinery, except Electrical	15,623	18,250	2,627
53	General Merchandise Stores	25,357	27,950	2,593
59	Miscellaneous Retail	21,210	23,800	2,590
37	Transportation Equipment	8,461	10,840	2,379
55	Automotive Dealers and Service Stations	23,956	26,260	2,304
63	Insurance Carriers	12,127	14,383	2,256
	TOTAL	599,005	697,121	98,116

the regional economy. Diversity has served the Portland area well in the past, and should continue to do so in the future.

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Chapter 11
Port of Portland

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Port of Portland

The Port of Portland is a public corporation in the business of transportation and economic development. The Port's primary purpose is to serve the needs of its customers and to build a strong economy in Portland and the State of Oregon. This mission has guided the Port from its beginnings in 1891 to its diversified operations of today. During that time, the Port has attempted to capitalize on the opportunities and the advantages of Portland's geographic location. In the past ten years, the patterns of international trade, the economics of transportation, and the competition between ports have made location and connections between locations even more important. This paper will present some examples of how changing trade patterns have affected the cargo hinterlands of the Port and how geographic thinking has affected some of its business decisions.

HISTORY OF THE PORT

The Port of Portland's history is a series of responses to the changing needs of trade, commerce, and transportation in the Portland region. Established by the Oregon Legislature, its first mission was to dredge and maintain a 25-foot-deep channel in the Columbia River the 110 miles from Portland to the sea (MacColl, 1976, pp. 421-422). As the dredging produced a safer and deeper channel, more and more cargo ships travelled up the Columbia to Portland. This led the City of Portland to create the Commission of Public Docks as a separate agency in 1910. The Dock Commission began to improve the harbor's trade facilities with the construction of the first public marine cargo terminal in 1913 (MacColl, 1976, pp. 446-448).

The Port's dredging operations filled Swan Island, which became the site of the first municipal commercial airport, dedicated in 1927 with an appearance by Charles Lindberg and the "Spirit of St. Louis." Commercial aviation grew rapidly, and in 1941, the location of the international airport was moved to its present site adjacent to the Columbia River (MacColl, 1979, p. 502). Swan Island did not go vacant for long. With the advent of World War II, the land was given by the federal government to the Kaiser shipbuilding interests, and a shipyard was constructed on the northern tip of the island. Liberty and Victory ships were built in as little as ten days during the war years (MacColl, 1979, p. 573). In 1948, the Port re-acquired Swan Island and purchased the improvements from Kaiser. Today, it is the site of the Port operated Portland Ship Repair Yard, employing between 1,000 and 3,000 workers in one of the largest repair facilities in the country.

Merger of Port and Dock Commission

The separate functions of the Port and the Dock Commission continued until 1970, when a vote of the citizens

Figure 11.1 Port of Portland's Terminal 6 provides a full service container facility with direct transfer on-dock to rail, truck and barge (Port of Portland).

merged the two agencies and the new Port of Portland was formed. In 1973, the State Legislature approved expansion of the Port District, adding Washington and Clackamas Counties, to cover the entire metropolitan area. The merger and District expansion broadened the Port's financial base and gave Portland the means to compete more favorably with other ports on the West Coast.

The first major construction project undertaken after the merger was the development of a containership facility at Terminal 6 in North Rivergate on the Columbia River. It has since been expanded to a complex with five container cranes, 3,000 feet of ship berths, 60 acres of paved container yard, and on-dock rail access (Figure 11.1). Much of the growth precipitating this expansion was caused by the high utilization of container barging on the Columbia/Snake River System. Containers move by barge to and from Terminal 6 and up-river ports in Oregon, Washington, and Idaho. Terminal 6, along with Terminal 4, also has automobile import processing centers, totalling over 400,000 import autos per year, making Portland one of the leading import auto ports in the United States.

The Port still owns and operates a

dredge, the Oregon, which is regularly leased to the U. S. Army Corps of Engineers. In 1976, the Corps completed digging the 40 foot channel in the Columbia River from Portland and Vancouver to the Pacific Ocean. The channel at the entrance to the Columbia was dredged to a depth of 55 feet in 1984. These two channel improvements allow vessels to land up to 42 feet in draft and transit without delay.

The Port's dredge is used primarily for routine channel maintenance, but is of critical value in the event of emergencies. In May, 1980, Mt. St. Helens erupted and blocked the shipping channel on the Columbia. The Oregon was on the scene within 24 hours and, along with dredges from the Corps of Engineers and private contractors, opened the channel sufficiently for ships to begin passing within three days. Fortunately, the Port has not had to respond to emergencies of similar magnitude since.

New Business Activities

One by-product of the Port's dredging program has been the production of prime industrial land in a variety of locations throughout the city. Swan Island and Rivergate were filled to above the flood plain using dredged material. The Port of Portland has been marketing and managing these and other industrial properties for more than 25 years. The Port currently owns 50 percent of the available industrial land in the City of Portland.

The Port's Swan Island Industrial Park, on the site formerly occupied by the municipal airport, is now the home of over 100 firms, principally involved in warehousing, distribution, and light manufacturing, and provides employment for about 7,000 persons. The 3,000-acre Rivergate Industrial District is zoned for heavy industry and is a popular location for regional distribution centers. Land is also being developed for industrial and commercial uses around the Port's International Airport and its three general aviation airports.

Today, the Port of Portland continues to expand its level of activity in fulfilling its mission to promote the maritime, shipping, aviation, commercial, and industrial interests of the Portland metropolitan area (Figure 11.2). Its first priority in doing so is to stimulate commercial and industrial activity in the community by taking advantage of the area's geographic location in the local, regional, national, and world transportation systems.

THE PORT'S GEOGRAPHIC SITUATION

The Port's location within the economic and transportation systems is an important factor in past development and in future opportunities for growth. The transportation system surrounding Portland funnels economic activity to Portland from throughout the United States and Canada and enhances Portland's position as the major distribution center in the Pacific Northwest (Montgomery, 1985).

Rail, Highway, and Air

Three major rail lines serve Portland, carrying thousands of intermodal containers between Portland and all points of the United States (intermodal containers move directly from ship to rail on the dock). Rail brings dry bulks from the Rockies and 100-car unit trains of feed corn from the Midwest. Hondas, Toyotas, and other import autos are distributed from the Port by rail throughout the country. The U. S. highway system brings truckloads of ag-

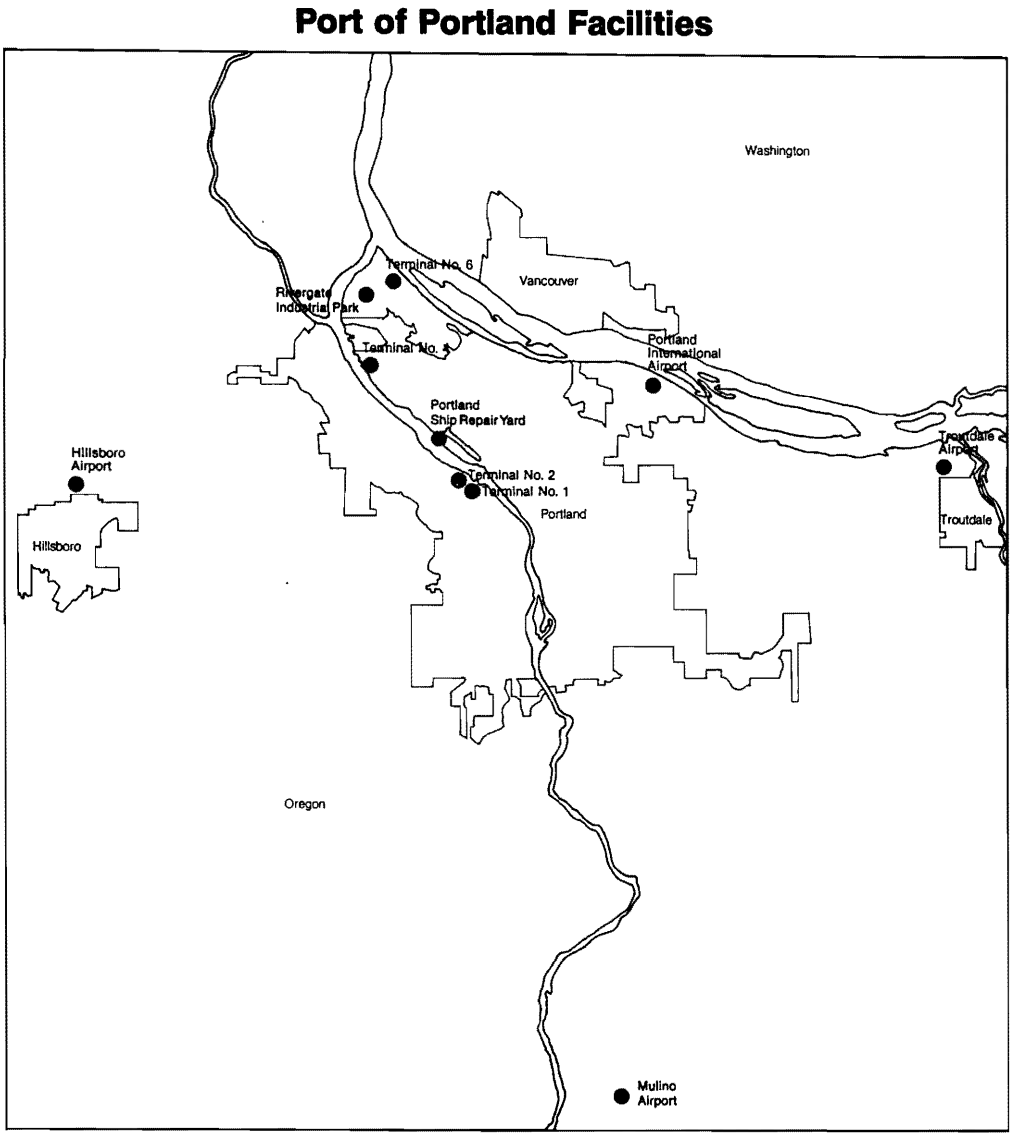

Figure 11.2 Port of Portland's operations (dots) include marine terminals, ship repairs, airports and industrial development (Port of Portland).

ricultural products from Oregon and Washington, forest products from Idaho, and grain from Montana and the Great Plains states.

Airlines and air cargo carriers move people and local products to both domestic and foreign markets. Over five million passengers and 65,000 tons of cargo moved through the Portland International Airport in 1985 (Port of Portland, 1986). Portland's selection by the U. S. government as the most recent air passenger gateway for nonstop service to Japan emphasizes Portland's position on the Pacific Rim, midway

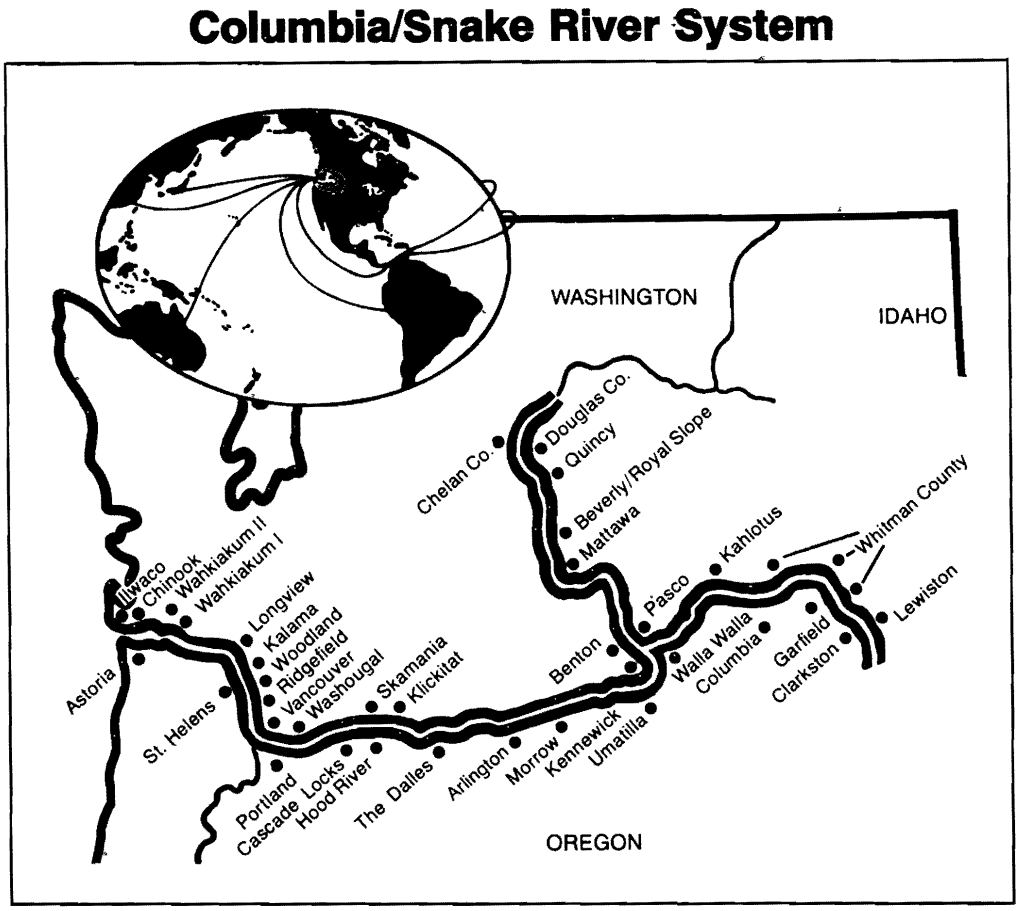

Figure 11.3 The Port of Portland is one of 34 ports on the Columbia/Snake River system serving U. S. and world markets (Columbia/Snake River Marketing Group).

between the economic centers of Asia and the U. S. and Europe (Figure 11.3).

The Columbia/Snake River System

The Columbia/Snake River System makes Portland unique among West Coast ports. It serves as Portland's outlet to the Pacific with over 30 steamship lines providing scheduled or charter service for all types of cargo from Portland to world markets. It also serves as the most cost efficient transportation mode for moving regional cargo to port. The Columbia and Snake Rivers form a 465-mile navigation system serving the States of Oregon, Washington, and Idaho (Figure 11.3). Up river from Portland, a 14-foot draft barge system is open year around, bringing the economy of water transportation another 355 miles inland as far as Lewiston, Idaho.

The Columbia/Snake River system is not only the deepest draft inland barge system in the U. S., but also the only system to be successful in barging containers (Containerisation International,

1983). More than 28,000 containers, as measured by 20-foot equivalent units, were barged to and from up-river ports in 1986. Container barging was pioneered in 1972, and since completion of the navigation system to Idaho in 1975, it has grown steadily. Now containers can be handled at six up-river ports on the Columbia and Snake Rivers: Lewiston, Idaho; Clarkston, Wilma, and Pasco, Washington; and Umatilla and Morrow, Oregon.

While containers make the system unique, grain is its staple. More than five million tons of grain are barged on the system each year. Fifteen up-river ports move grain through more than 20 river elevators. Unlike containers, grain movements are not a recent development. Grain moved on steamboats in the 1850's, and the first port district up river was created at Kennewick, Washington in 1915 to help facilitate the movement of grain (Vanselow, 1982, p. 57). Forest and agricultural products make up the bulk of the downbound commodities. Up-river barges carry fertilizer and petroleum products to support farms and communities throughout the Columbia/Snake Region. It is this geographic situation within the transportation system that the Port attempts to use to create advantages for economic activity in Portland.

CHANGING HINTERLANDS AND TRADE PATTERNS

The center of world trade activity shifted during the early 1980's. The volume of cargo moving in the transpacific trade routes surpassed that moving across the Atlantic. This change in focus toward Asia created a variety of opportunities for West Coast ports. As a result, Portland plays an increasingly important role as a national gateway and distribution center for goods moving in transpacific trade. This has resulted in a change in the hinterlands of the Port.

The traditional natural resource base for Portland has been agricultural and forest products. Portland was primarily a regional port with a Pacific Northwest regional hinterland. Now, however, Portland is serving much broader national markets. This is primarily due to the city's position on the Pacific Rim, but the specific factors influencing the change in hinterlands vary for each of the major commodities. Grain exports, import automobiles, and containers serve as examples of the types of changes that are occurring.

Grain

Since the days when wheat moved by steamboat from Eastern Oregon and Washington to Portland for transshipment onto sailing vessels and the export market, the volume of wheat has grown consistently. There are two major components to the Columbia River grain trade today, however. One is the traditional movement of Pacific Northwest wheat. The second, the export of Midwest feed corn, is much more recent. Grain currently is exported out of eight elevators on the lower Columbia River: four in Portland, two in Kalama, Washington, and one each in Longview and Vancouver, Washington. Other Pacific Northwest grain elevators are located in Puget Sound, with two in Tacoma and one in Seattle.

Prior to 1975, grain exports grew at the same rate as production increases in the farms of Oregon, Washington, Idaho, and Montana (Beeman, 1983, pp. 9-11). In 1975, the extension of navigation to Lewiston, Idaho, 355

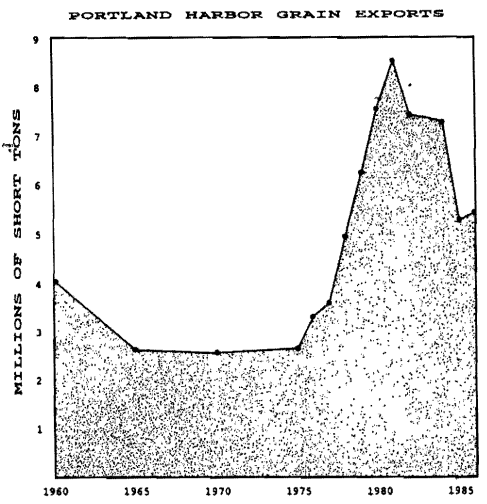

Figure 11.4 Grain Exports through Portland Harbor (Merchant's Exchange of Portland, Oregon).

miles inland from Portland, was completed. Export volumes doubled over the next five years as a result of two related factors (Figure 11.4). Navigation capabilities and the low cost of barging, coupled with new investment in river grain terminals, brought grain to the Columbia/Snake River System from the Dakotas, Minnesota, and as far east as Illinois and Indiana.

This grain was trucked to new Snake River ports at Lewiston, Idaho, and Clarkston, Wilma, Central Ferry, and others in Washington. The river ports then transferred the grain to barges for shipment to the export elevators at Portland and other Columbia River ports. The truck/barge combination via the Columbia/Snake System attracted wheat from upper Midwest producers that previously had used the Gulf coast for export. While the distance from the Midwest to either the Gulf or the Pacific Northwest is comparable, the sailing distance from Portland to Japan is less than half the distance from the Gulf through the Panama Canal. Portland to Yokohama is 4,342 nautical miles compared to 9,296 from Houston to Yokohama.

The combined efficiencies of inland and ocean transportation helped the Columbia River attract 31 percent of all United States wheat exports by 1986 (Edison, 1987). Recently, U. S. wheat export volumes have declined considerably due to a loss of overseas markets as more countries have become self sufficient in grain production. However, the Columbia River ports have fared better than the nation as a whole, decreasing by less than half the national rate.

As the wheat hinterland was expanding eastward, Portland was able to participate in receipt of a new commodity for export. Feed corn from Nebraska and the Midwest began moving by unit train to the Columbia River for export in 1983. Bulk shipments of feed corn first came to the Pacific Northwest in 1978. Prior to that year, the Columbia River elevators and the three elevators in Puget Sound handled only wheat and smaller volumes of Northwest barley and oats. From 1975 to 1977, wheat export volumes averaged 6.5 million tons through the Columbia River and under two million tons through Puget Sound (Table 11.1). Corn exports were negligible.

In 1978, the grain companies shifted some of their export feed corn from the Gulf Coast to the Pacific Northwest. Feed corn was shipped to Puget Sound by rail, while wheat exports were diverted to the Columbia River. The average volumes during this period, from 1979 to 1981, increased dramatically in both commodities. Puget Sound corn exports grew to an average of 5.6 million tons per year, but their wheat vol-

Table 11.1. *Grain exports via the Columbia River and Puget Sound, in short tons (U.S. Army Corps of Engineers, 1985).*

	Columbia River		Puget Sound	
	Wheat	Corn	Wheat	Corn
1975	6,567,779	722	1,786,193	517
1976	7,164,179	37,362	2,481,378	574
1977	5,994,492	1,767	1,372,924	37
1978	9,335,419	4,851	1,033,241	1,890,139
1979	10,114,052	1,471	1,379,150	3,868,317
1980	11,786,726	1,241	141,820	7,320,682
1981	12,809,538	21,219	329,790	5,669,012
1982	10,834,473	177,713	1,096,960	1,400,399
1983	11,659,763	1,076,085	1,057,434	3,491,605
1984	10,790,119	5,464,055	763,052	5,391,461
1985	8,327,245	4,504,822	402,915	3,097,831

ume declined by two-thirds. At the same time, Columbia River wheat exports grew to an average of over 11.5 million tons per year (Table 11.1).

Then in late 1983, the Peavey elevator was built at Kalama, Washington specifically to handle feed grains, and Columbia Grain expanded their Portland elevator and added corn handling capabilities. With Kalama handling the majority of the volume, Columbia River corn exports averaged nearly 5 million tons in 1984 and 1985. Wheat exports declined somewhat, averaging 9.6 million tons per year. By comparison, Puget Sound exports averaged over 4.2 million tons for corn and less than 600,000 tons for wheat (Table 11.1).

The economies of barging on the Columbia/Snake River System continue to play an important role in maintaining high volumes of wheat exports. In the case of Midwest feed grains, it was the excellent inland rail connections and the shorter transpacific route to Asia that brought the cargo here.

Import Autos

The increase in import automobile volumes through Portland is partly due to growth in the total number of U. S. imports. But of greater significance is the increase in distribution service area captured over the last 10 years. In 1975, Portland was serving as an import center for import autos arriving from Europe and Japan for distribution to the states of Oregon, Washington, Idaho, Montana, and part of Nevada. That year Portland handled 60,000 autos. By contrast, 411,000 autos were imported through Portland in 1986, and the distribution area has expanded to 30 states (Figure 11.5).

This tremendous growth has occurred primarily because Portland's geographic location provides the shortest route for Asian manufacturers to reach the major American markets. The ocean voyage to Portland from Japan or Korea is a day shorter than to California ports and seven to ten days shorter than to the Gulf Coast. This provides a significant benefit to owners of auto carriers. By

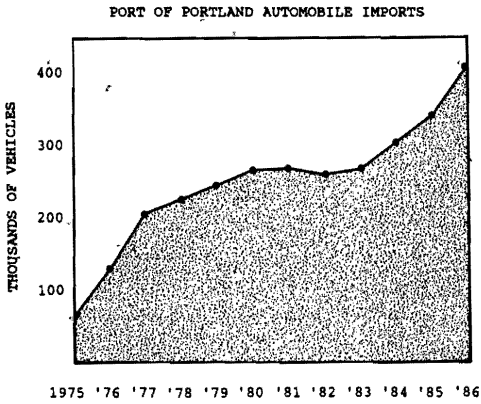

Figure 11.5 Port of Portland automobile imports, in number of vehicles (Port of Portland).

turning the ship around in Portland rather than the Gulf, ship utilization increases, which decreases requirements for investment in specialized auto carriers by one-third. The Puget Sound ports of Seattle and Tacoma have similar locational advantages with respect to the Pacific Rim, and they have experienced growth in auto imports, as well. Tacoma handled 170,000 autos and Seattle 118,000 in 1986 (*Oregonian*, 1986; (*Daily Shipping News*, 1987).

Import automobile terminals are land intensive, with some facilities requiring up to 125 acres. Portland has taken the lead in auto imports, in part, because of its available supply of large tracts of land that are both on the water and served by excellent inland rail connections.

On the inland side, the autos move by truck to the states of Oregon, Washington, Idaho, Montana, and Wyoming, and by rail to the remaining markets. From Portland, it takes three days by rail to reach distribution centers in Denver and Omaha, four days to Chicago, Kansas City, and St. Paul, five days to St. Louis, Cleveland, and Dallas, and six days to Memphis. In the early 1970's, these rail-served markets were served by Gulf and East Coast ports. One of the major reasons Portland was able to capture these markets is that, with the travel times shown, autos imported through Portland could reach the interior distribution points before they would even arrive at the Gulf or East Coast ports.

The fact that there are three transcontinental railroads competing for business in Portland helps create the efficiencies that permit these fast service times and keeps inland rates low. There are indications that the role of rail transport may increase even further. Experimental moves are now testing the efficiency of distributing autos to the East Coast from Portland and other West Coast ports. The principle is the same. There may be operating efficiencies for auto companies in Japan, Korea, or Taiwan to use what is called the mini-land-bridge to the East Coast markets rather than the current all water route through the Panama Canal.

There are some complicating factors in the East Coast land bridge compared to rail service to the Midwest and Southwest. One is the relationship between imports and U.S. production for those foreign auto companies with manufacturing plants in the East. Generally, the foreign auto companies use domestic production primarily to serve the eastern markets, while the western U.S. markets continue to be served by imports. Another factor is that the rail move must be divided between two railroads, those serving the West Coast and those serving the East, in order to reach all of the eastern seaboard markets. This reduces the handling and cost efficiencies that benefit the auto companies in the Midwest distribution.

The net result is that there is still a time savings, but the cost savings are not certain as yet.

The domestic production of foreign automobiles appears to be in a growth trend. This could have an impact on the imports. Current indications are that U.S. production will focus on specific models, and not the entire range of models, and it is likely to focus on autos produced for East Coast markets. This suggests that there is still growth opportunity for imports on the Pacific Coast. The domestic production provides another cargo opportunity as well. CKD (complete knock down) autos will be imported in containers through West Coast ports destined for manufacturing plants in the U.S.

Containers

For grain and automobiles, Portland clearly has made the transition from a regional to a national port. Not only does the volume of cargo moving to and from national markets dominate the Port's total volumes for these commodities, but the Port also plays a dominant role in the national market. In both cases, Portland built the dominant national position from its strength as a regional port. This transition has not yet occurred for containers.

Portland does serve as a major container port, with over 1.4 million tons of container cargo per year, but its cargo base is dominated by regional export agricultural and forest product commodities. Seattle/Tacoma and Los Angeles/Long Beach handle significantly larger volumes of container cargo, primarily serving the national markets.

Portland has some natural advantages for serving the Pacific Northwest regional exporters. One major advantage is the low cost container barge system, which makes Portland cost competitive for shippers from throughout the region. The barging helps to funnel regional cargo and to build the export cargo base in Portland. This includes cargo from the major agricultural producing regions in Eastern Oregon and Washington, Southern Idaho, and Montana, and paper and wood products from Idaho and Montana.

Portland also serves the national container markets. Portland's Terminal 6 was built in 1974 with on-dock rail transfer capabilities. When the terminal was expanded in 1981, the rail capabilities were expanded as well. Now the Port is in the process of further expanding the intermodal rail, creating the capacity for handling unit trains of the new double-stack cars.

Serving the national markets is now necessary to generate sufficient cargo to justify high levels of regularly scheduled steamship service, which also is required by local and regional shippers. And given the competitive situation, container service to the national markets is becoming even more important. This high level of activity brings additional steamship service, as well as better inland transportation service, rates, and better positioning of equipment such as empty containers. Therefore, while Portland does not enjoy the same dominant position it holds in grain and autos, there is potential for growth because the same inland transportation advantages exist for containers that helped establish Portland's leadership position in these other commodities.

STRATEGIES BASED UPON GEOGRAPHY

The geographic changes in Port business patterns are most noticeable in the growth of marine activity, but they are equally significant in other Port

operating areas. The increasing ties with Japan and other Asian countries, deregulation, competitive factors, and internal business objectives have resulted in the development of business strategies that rely heavily upon geographic understanding and analysis. Examples include the Port's response to deregulation of the airline industry, the decision to expand the Port's Ship Repair Yard activities, and the development of target markets for the Port's industrial real estate.

Air Service

Deregulation of the airlines in 1978 stimulated change within an industry that is still undergoing transition. Under deregulation, the marketplace dictates service levels. This shifted the responsibility for maintaining existing levels of air service and attracting new service from the federal government to airports and the communities they serve. So far, this has resulted in significant growth in the number of carriers serving Portland International Airport. It also has improved service to Portland's top 30 markets, and it has helped to stimulate an increase in the number of passengers travelling through the airport. Deregulation is now entering its second phase of response, with the number of airline mergers and acquisitions increasing dramatically. It remains to be seen how this change in the ownership and structure of the airlines will affect service at this country's airports.

Since deregulation, the Port has developed strategies for service improvements based upon an understanding of its geographic situation and its relationship to the broader air transportation network. Portland's location on the edge of the continent and between two larger markets in San Francisco Bay and Seattle suggested that the Port could not expect significant growth in service based solely on the Portland origin and destination market. It would be necessary to increase the number of passengers using Portland as a connection point between two other markets.

Two obvious sets of markets emerged as priorities. One set was the four major airline hub cities of Denver, Chicago, Atlanta, and Dallas/Fort Worth. The second set included the other major U.S. direct destination cities. The Port then developed two strategies for increasing the number of connecting passengers to these two markets. The first was to develop a regional hub in Portland. The Portland hub would take advantage of Portland's central location on the West Coast and the efficiencies that location brings to airlines in the utilization of their aircraft. The regional hub would feed passengers from throughout the Pacific Northwest to Portland for both direct traffic and connections to the major airlines and national markets.

The Port began marketing this concept four years ago. Since then, the level of service to these Pacific Northwest regional markets has increased significantly. Passenger volumes increased threefold in the four years between 1982 and 1986 (Table 11.2).

The second strategy was based upon the recognition of the value of Portland's location with respect to the Pacific Rim. A location on the West Coast is a great advantage for development of a gateway for air passengers and cargo moving between the United States and Japan. And in this case, being a smaller market would be an advantage for an airline entering the transpacific market. They would have less head-to-head competition from other airlines and they would have a

Table 11.2. *Portland International Airport total and regional passenger volumes and air cargo tonnage (Port of Portland, 1986).*

	Total	Regional Passengers	Air Cargo Passengers	Tonnage
1980	3,870,664	197,334	44,754	
1981	3,715,117	180,636	41,978	
1982	3,957,937	355,513	51,779	
1983	4,538,579	426,875	52,835	
1984	4,750,708	462,626	58,426	
1985	5,047,873	543,190	65,794	

more efficient operation because of less congestion.

The international markets are still regulated and new service is determined in bilateral negotiations between the governments of the two countries involved. So, the Port must develop its business case for both the airlines and the government. In late 1986, Portland and Delta Airlines were awarded a new direct route to and from Tokyo for air passengers, with service scheduled to begin in March, 1987. Portland was awarded the route, in part, because of its business connections with Japan, because of its facility, and because of its ability to attract feeder service from several internal domestic markets.

The U.S. government is now reviewing a small package air cargo route application between the United States and Tokyo. Federal Express has selected Portland as its gateway, and if selected, new service could begin as early as May, 1987.

This new passenger and cargo service should make Portland more attractive for other national and regional air carriers to offer additional feeder service to the four national hubs and other direct national markets. It also should enhance the business ties between Portland and Japan, which could make Portland a more attractive location for investment by Japanese distribution and manufacturing firms.

Ship Repair Yard Expansion

In 1979, the largest dry dock on the West Coast was put into service in Portland. It was built, with taxpayer support, to serve the Alaskan oil trade. The Port's location on the Pacific provided a competitive advantage for the repair of the U. S. Flag tanker fleet. Most of the tankers in this fleet move directly from Alaska to California and back. The return sailing was empty, and with little diversion required from their normal route, a stop in Portland for routine or major maintenance and repair was more cost effective for the ship owners than diverting the ship thousands of miles to foreign yards or to U. S. ship yards on the Gulf or East Coasts.

This investment has returned thousands of jobs to the Portland community in the repair of Alaskan tankers. The Port also has been successful in diversifying and creating more jobs at the Ship Yard by attracting Alaskan oil module construction (Figure 11.6). As in the case of tanker repair, Portland and Oregon's proximity to Alaska proved to be an advantage in attracting

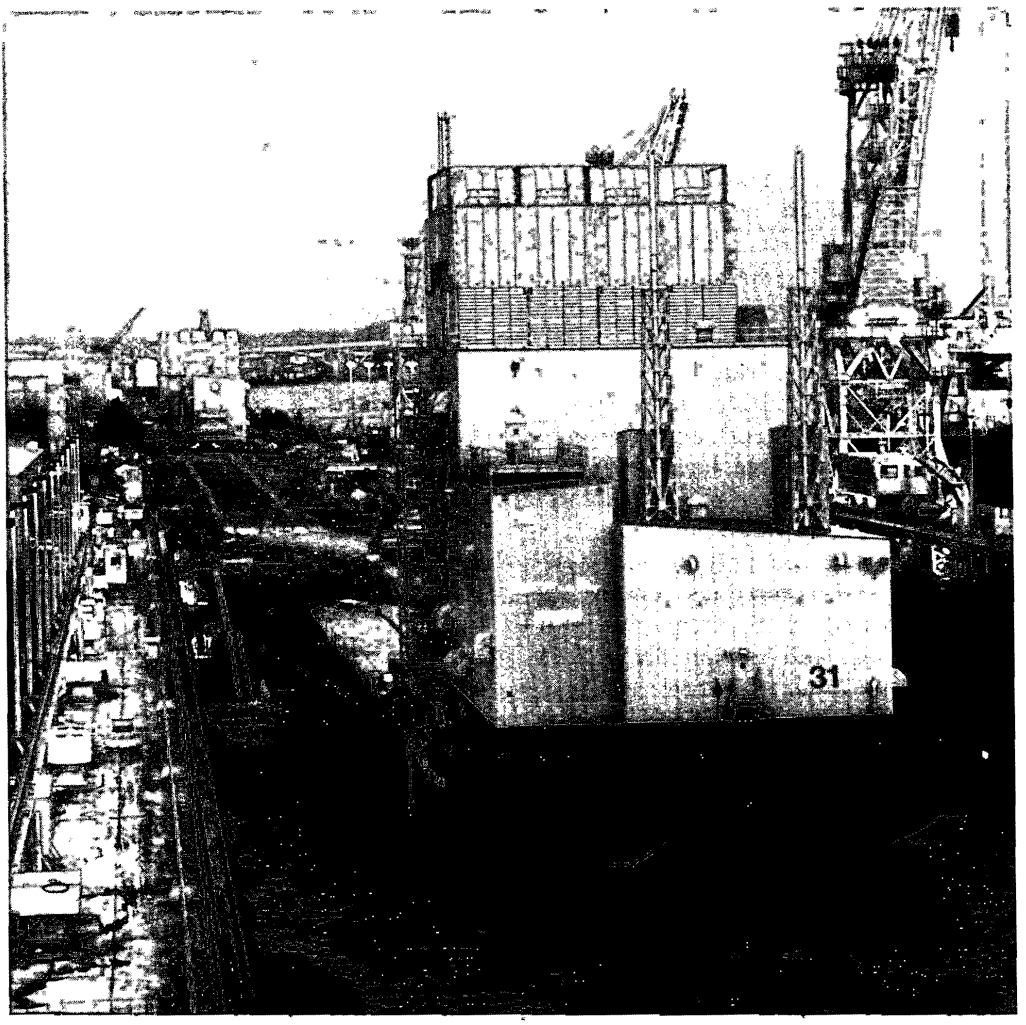

Figure 11.6 Oil module's constructed at the Portland Ship Repair Yards are loaded onto barges on dry Dock 4 for shipment to Alaska (Port of Portland).

this business. Construction in Portland saves millions of dollars in transportation costs of moving the modules to Alaska, compared to Gulf and East Coast construction sites. And since the modules move by barge at slow rates of speed, this location also provides a significant time advantage to the contractors constructing the modules. Portland provides an additional three weeks to complete construction and still meet the limited window of time available to move the modules into place off Alaska's arctic slope.

Industrial Marketing

The Port has an extensive inventory of unique land holdings in the metropolitan area. Geographical considerations have played an important part in determining what kind of activities are

best suited for the various parcels and in developing target prospects.

With changing trade patterns and the Japanese interest in establishing manufacturing and distribution centers in the U. S., the Port is now in an excellent position with respect to Japanese investment opportunities (See Chapter 11). It has had a long history of success in working with companies like Toyota, Honda, and Marubeni to fullfil their marine cargo distribution needs, both for imports and exports. More recently, the Port and the Portland metropolitan area have been successful in attracting Japanese investment in industrial properties.

Japan is not the only target, however. Regional companies looking to move or expand, U. S. companies from other regions, and foreign firms from Europe and other countries in Asia, are also targets for investment. But it is not the current location of the prospects that is of specific geographic interest. What is of interest is that the Port uses geographic factors such as location with respect to the population centers and the transportation network to determine its marketing strategies.

Using these factors, specific sites within the Port have been designated for specific activities, such as heavy industry, light manufacturing, warehousing and distribution for local, regional, and national markets, commercial office and retail, aviation related, and others. Another category is termed "complex" land. This land presents unique opportunities to combine the available land with direct access to marine terminals and rail yards, or air cargo facilities, for special "complexes" of activities. These parcels may be of special value to individual companies or groups of companies working together to expedite trade, manufacturing, and distribution opportunities in one location.

THE FUTURE OF THE PORT

The Port of Portland has experienced considerable growth over the last decade. The level of business activity has increased in all four of its operating areas of marine, ship repair, aviation, and industrial development. The size of its hinterlands for major cargo movements also has increased. New markets for air service and the ship repair yard have opened. There has been more activity in the development and marketing of the Port's real estate.

The Port of Portland continues to work to improve the local transportation system to insert Portland into the broader national and global transportation networks. In doing so, the Port will work to improve Portland's leadership position in regional distribution and continue to expand Portland's role as a transhipment point for people and cargo moving throughout the Pacific Rim.

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Chapter 12
Silicon Forest

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The Silicon Valley in Santa Clara County, south of San Francisco, is well known and appropriately named given its focus on activities based on silicon-chip technology. On the other hand, perhaps "Silicon Forest" sounds a rather grandiose title for the new industrial and business service development in the Portland metropolitan area. It suggests that the scale, diversity, and dynamics of the region's high tech are becoming sufficiently prominent to be widely recognized at the national level. Of course, the adjective "silicon" has been hackneyed, devalued, even misconstrued by being permutated to describe so many other areas of the country, like Colorado's "Silicon Mountain" and Texas' "Silicon Prairie," and places abroad such as Canada's "Silicon Valley North" (Steed, 1986), central Scotland's "Silicon Glen" or Japan's "Silicon Island" of Kyushu. Yet, in a time of slogans, cliches and shorthand, the adage "Silicon Forest" seems to be apt for the contemporary Portland scene as it captures the imagination of the public, politicians, professionals and entrepreneurs alike and encapsulates a set of conditions and forces with strong implications for the future.

It is difficult to classify high tech activities in the Portland area. For this reason the focus here is on firms. Two sources of information are used. The first comprises data from the U.S. Bureau of Census' *County Business Patterns* covering the four counties -- Multnomah, Clackamas, Washington (in Oregon) and Clark (in Washington) -- that make up the Portland-Vancouver metropolitan area. Unfortunately the latest data on hand are three years old - for March 12, 1984. Furthermore, for reasons of confidentiality about specific firms, most Standard Industrial Classification (SIC) entries in this source do not give exact employment, only bands, such as a range of 2,500-4,999 employees in SIC 367 in Washington county. This provides a crude estimate of high tech employment in the Portland area as between a minimum of 26,548 and a maximum of 47,041 in the week including March 12, 1984 - figures albeit up on those of 22,928 to 44,019 in the same week in 1982.

The second source is a survey of firms conducted in 1985 by the Portland Chamber of Commerce and the Tualatin Valley Economic Development Corporation. This is certainly far more accurate, but may not be complete as it covers only 173 firms, while it is believed that there are now more than 200 high tech firms in Portland (Figure 12.1). The most striking specialization is in SIC 382, measuring and control instruments, a field dominated by Tektronix, followed by SIC 367, electronic components, a very diversified production group, and SIC 357, office, computing and accounting machinery. Of far lesser scale, but perhaps not importance, are SICs 366, 384, 361, and 737.

From this information it is not un-

Table 12.1. *A sample of 173 high tech firms in the Portland-Vancouver region by SIC groups, 1985 (Tualatin Valley, 1985).*

SIC		No. of Firms	Size ‹49	50-499	›500	Employment
356	General industrial machinery	2	2	-	-	12
357	Office, computing machinery	21	16	4	1	2,166
361	Electric transmission equipment	3	2	1	-	651
362	Electric industrial apparatus	12	10	2	-	498
365	Radio and Television equipment	4	3	1	-	145
366	Communications equipment	20	15	5	-	970
367	Electronic components	31	24	5	2	5,930
369	Misc. electrical machinery	5	3	2	-	301
372	Aircraft and parts	4	4	-	-	40
381	Engineering, laboratory, scientific instruments	9	7	2	-	260
382	Measuring and control instruments	28	23	3	2	22,515
383	Optical instruments and lenses	3	3	-	-	40
384	Surgical, medical and dental instruments	14	11	3	-	755
737	Computer, data processing service	17	14	3	-	652
Total		173	137	31	5	34,934

reasonable to estimate that up to 40,000 workers are employed in Portland's high tech today. This is equivalent to only one-tenth of the high tech work force in Silicon Valley (Saxenian, 1985). Although this seems to be a very small proportion, the following points should be borne in mind.

First, the U.S. Office of Technology Assessment (OTA) in 1984 calculated that Portland's high tech employment in 1976 was only half that figure (19,214), placing it 26th amongst U.S. SMSAs - albeit ahead of such centers as Austin, Texas, Miami, Florida, and the Raleigh-Durham, North Carolina, but well behind Seattle, Washington (c. 48,000). Since the report claims that Portland's 1976-80 high tech employment growth rate was only 18.3 percent - one of the lowest amongst all American SMSAs - most expansion must have occurred after 1980, considerably raising its U.S. rank.

Second, changes in the population of high tech firms since 1976 lend support to the reality of this growth. The Oregon Department of Economic Development claims that the number of computer and electronics firms alone in the State increased by 60 percent from 568 to 910 between 1972 and 1984, making it one of the regions of fastest high tech growth in the entire country. Based on this, only California and Massachusetts, the historic high tech core areas, have more of these firms on a population ratio basis than Oregon amongst the 50 states. New births, spin-offs from existing firms, and in-

movement of firms from outside Oregon explain these increments. But much growth was localized in Portland which, according to the American Electronics Association, now ranks 10th in the nation in the numbers of electronic and information-processing companies.

Third, until recently firms have significantly expanded numbers of jobs. For instance, by 1985, employment in Tektronix alone, the leading firm in Portland, exceeded 75 percent of the OTA's 1976 *total* of high tech jobs for the *entire* metropolitan area; and many other firms had grown, too.

Fourth, Portland-located firms have achieved very significant U. S. and world market penetration in selected high tech niches. This is particularly true of the "raw materials" end of the production chain. Two-thirds of the non-communist world's entire silicon wafer output for microchips is localized within 40 miles of downtown Portland. At the other end of the chain, Portland firms are pre-eminent in final goods such as measuring, controlling, and navigational instruments, array processors, and computer-assisted design (CAD) and computer-assisted engineering (CAE) equipment.

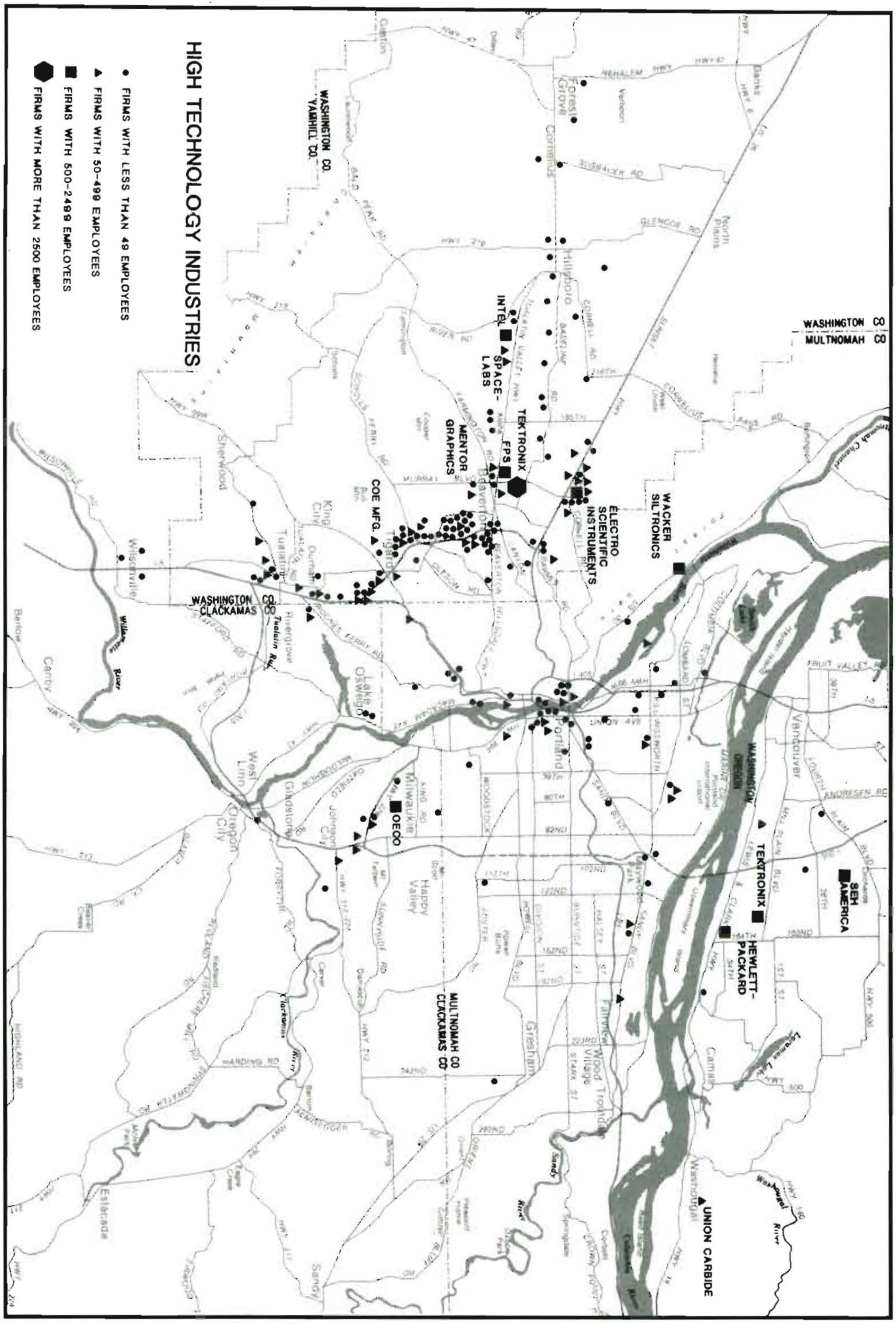
The location of high tech firms in the Portland area is characterized by clusters (Figure 12.1). The dominant aggregation is on the west side along the Interstate Highways I-5 and I-217, especially in Tigard and Beaverton, and in the Sunset Corridor in Beaverton, Hillsboro and Forest Grove along U. S. Route 26. Growth here has been the major phenomenon of the last decade. By far the largest firms (by employment) have located here on spacious sites: Tektronix (13,024 workers), Floating Point Systems (1,320), Electro Scientific Instruments (800) and Mentor Graphics (780) all near Beaverton; Intel Corporation (3,250) in Hillsboro; and Coe Manufacturing (150) in Tigard. All in all, about 23,000 jobs are localized in this zone.

Other clusters are far less marked. Those worthy of note occur: in central and inner Portland, which with over 1,000 employees, still serves as an "incubator" for small firms but also concentrates several important computer software producers; and in the southeastern Milwaukie/Clackamas area along highway U.S. 224 near the I-205 interchange (Figure 12.1). There, some medium-sized firms were joined in 1986 by OECO (650 workers) which relocated from inner southeast Portland to what is believed to be the area's largest new electronics facility since 1979. About 3,000 people work in high tech in this zone. Many small firms are scattered elsewhere, though medium-sized ones are sited near Portland International Airport in the northeast. Wacker Siltronic (800) forms a major "outlier" along the Willamette River in the northwest. Across the Columbia, Vancouver, Washington, hosts a notable group of firms with about 3,000 employees, the most prominent being Shin- Etsu Handotai (SEH) America (675), Hewlett-Packard (500), and a branch of Tektronix.

FACTORS IN THE RISE OF PORTLAND'S HIGH TECH INDUSTRY

Silicon Valley is located near the site of the first electronics breakthrough -- the invention in 1912 of the cyclotron, from which television, telecommunica-

Figure 12.1: Distribution of high tech establishments in Portland metropolitan area (various sources).


HIGH TECHNOLOGY INDUSTRIES
• FIRMS WITH LESS THAN 49 EMPLOYEES
▲ FIRMS WITH 50–499 EMPLOYEES
■ FIRMS WITH 500–2499 EMPLOYEES
⬢ FIRMS WITH MORE THAN 2500 EMPLOYEES
WASHINGTON CO.
YAMHILL CO.
WASHINGTON CO
MULTNOMAH CO
WASHINGTON CO.
CLACKAMAS CO
MULTNOMAH CO
CLACKAMAS CO
INTEL
SPACE-LABS
TEKTRONIX
FPS
MENTOR GRAPHICS
COE MFG.
ELECTRO SCIENTIFIC INSTRUMENTS
WACKER SILTRONICS
OECO
TEKTRONIX
SEH AMERICA
HEWLETT-PACKARD
UNION CARBIDE
WASHINGTON
OREGON

tions and computers were all developed. By contrast, Portland's high tech originated only 40 years ago. Yet the seeds were sown in the 1930's. Then, Portland had a lively radio club, a reflection, perhaps, of the desire of Oregonians to reduce or overcome their relative isolation from the mainstreams of American life and economic change. If that club introduced people to radio and electrical technologies, then two other events -- the building of the Bonneville hydroelectric power station on the Columbia in the 1930's and World War II -- had a profound effect bringing engineering into major prominence in the region's economic life.

Franklin D. Roosevelt had envisaged that Bonneville Dam, built with U. S. federal funds, would "transform Portland into a city of whirring machinery." In fact, the dam created the pre-conditions, in the shorter term, for the growth of industries to serve America's Pacific war effort and in the longer term for development of electro-metallurgical and electro-chemical industries. Being one of the west coast's few deep water ports, Portland shared significantly in the massive expansion of military industries located from Seattle to San Diego, especially shipbuilding along the Willamette and Columbia Rivers. Although this could hardly be considered "high tech," it stimulated the birth and development postwar of local firms to manufacture navigational devices and instruments. No less important for long-term economic growth and modernization in Portland, was the large influx of workers from other states, often bringing new skills, the engagement of women in factory work, and the exposure of average citizens to modern technologies on sea and in the air. The emergence of high tech industrial development in Portland since 1945 can be linked to three major factors.

New Market Opportunities

Local and Pacific Northwest regional market opportunities induced the development and adaptation of existing firms and the birth of new ones. Often, these forged linkages with the "staples": logging, paper making, wood manufacturing, shipbuilding, aluminum, as well as with salmon fishing, river and marine navigation. Opportunities changed, however, as postwar growth gave way in the 1970's to marked decline in production and restructuring in these industries, requiring Portland suppliers to search for new markets elsewhere and to introduce new products.

A classic case is Precision Castparts Corporation (PCC) (Portland) which, in the 1950's, began casting tougher metal cutters to meet the needs of local chain saw manufacturers (like Omark) serving an expanding lumber industry. Gradually, by investing heavily in research and development, applying a new ceramic shell process to forge larger castings, and by searching for customers outside the Pacific Northwest, PCC has diversified into custom-made castings not made elsewhere in the U.S. Today, it is the nations' largest, and the world's second largest, producer of high tech jet engine castings, using titanium supplied by the Oregon Metallurgical Corporation of Albany, and catering to the makers of civilian and military aircraft and the Space Shuttle. Although this is a link with a major West Coast high tech industry - Boeing in Seattle and Lockheed in Los Angeles - the link is indirect. The castings are supplied to engine manufacturers, General Electric and Pratt & Whitney, located elsewhere in the U.S. and from PCC's subsidiary manufacturing facilities in England and France to Rolls Royce in Europe. PCC

is one of Portland's leading high tech firms, a multinational corporation, ranking by revenue, as the 12th largest public company in Oregon.

Hyster, another longstanding Portland firm, has stimulated local entrepreneurs to design and manufacture new process equipment for its business activities. Although no longer producing hoisting equipment (the origin of "hyster") it recently opened a new research and development unit in Troutdale (east of Portland) which makes extensive use, for instance, of computer-aided design (CAD) and computer-aided engineering (CAE) products developed and manufactured by Mentor Graphics and Metheus Corporation.

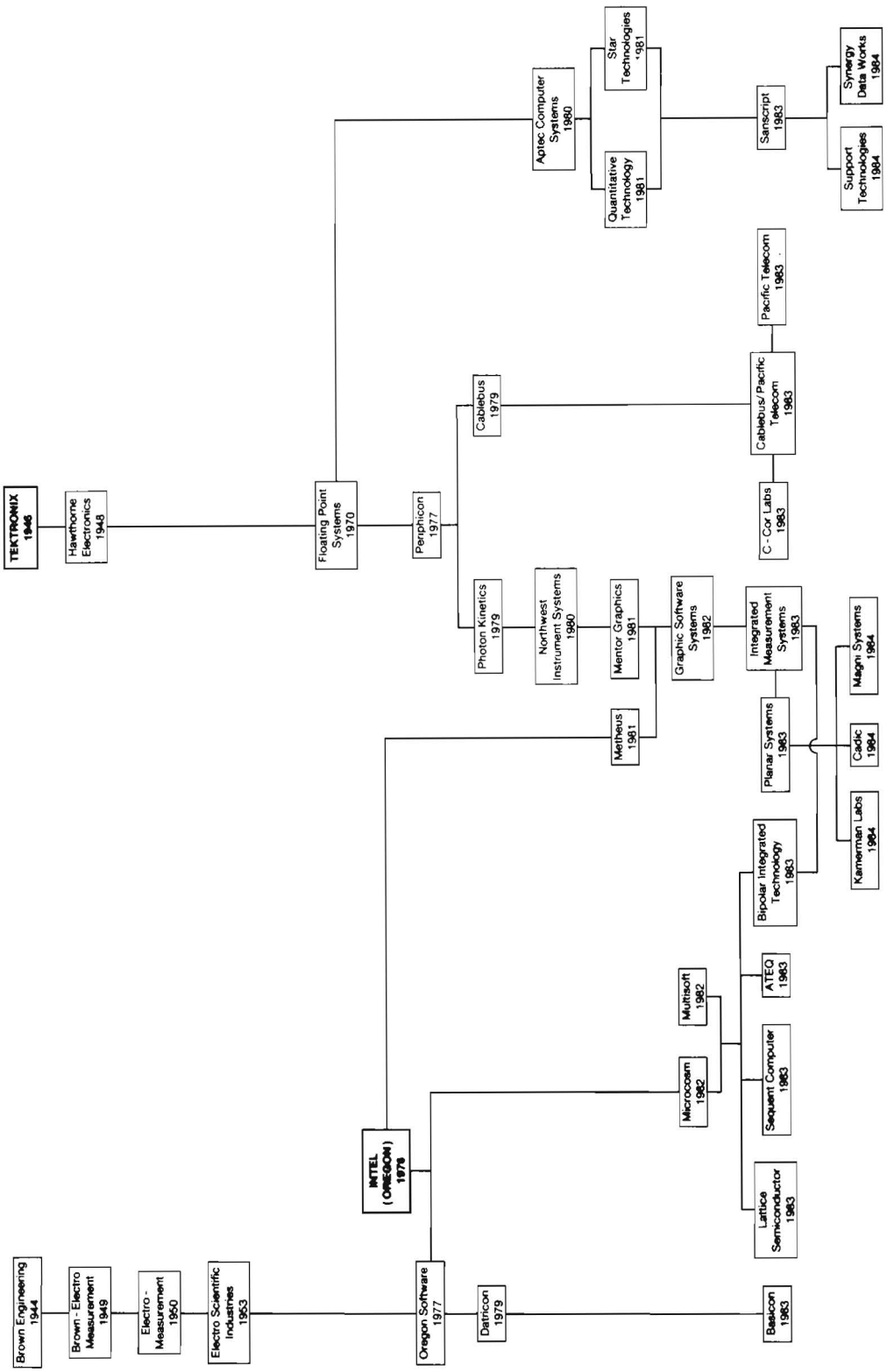
A survey of other Portland area high tech firms shows similar market linkages to Pacific Northwest "staples." For example, North American Controls Inc. (Portland) makes electronically-controlled saw milling machinery while Coe Manufacturing Co. (Tigard) specializes in laser measurement devices for plywood and sawmill equipment. Others include Accuray Corporation producing software for the paper industry, Concept Technologies which manufactures graphics laser printers for the printing industry (a significant local activity), and Aquidata Corporation making electronic measuring instruments for grain farming and silos (important for agriculture in the region). Pace Industries (Beaverton) specializes in marine electronics and fish lures and Matthews Marine Systems Inc. makes ship-steering equipment. Arnav has recently diversified from marine navigation instruments into aviation navigation systems, bought mainly by west coast based aircraft manufacturers.

Local Entrepreneurship

The region's human resources, especially entrepreneurship, have been decisive in establishing and developing innovative activities. Fortunately, the drive of locally-born and immigrant entrepreneurs, who preferred to remain in Oregon, has combined with improvements in the riverport, airport, highways and land management around Portland to launch substantial industrial diversification. Experience individuals gained in wartime industries often spawned engineering or electrical expertise, innovation and entrepreneurship which in peacetime has proved itself capable of penetrating national and overseas markets with new products. These changes created the preconditions for the "take-off" in the 1970's and 1980's of the latest high technology industries.

In 1947 two of these former Portland radio club enthusiasts -- Howard Vollum and Jack Murdock -- founded a firm they called Tektronix. It started making the world's first synchronized oscilloscope which Vollum had invented. Producing a wide range of electronic measuring, testing and control devices and instruments, Tektronix today has a payroll of 13,024. Apart from the State it is Oregon's largest employer. Besides stimulating development of other local firms to supply it materials and components, Tektronix gave birth after 1970 to more than a dozen "spin-offs" to manufacture new product lines (Figure 12.2).

This type of development - the "spin-off" - may add diversity but it also frequently deepens local specialization. The process of a new firm developing from an existing one has become particularly frequent in the new high technology of the past decade. One "spin-off" from Tektronix, Floating Point Systems (Beaverton), already the biggest U.S. maker of computer array processors, is the area's third largest


Brown Engineering 1944
Brown - Electro Measurement 1949
Electro - Measurement 1950
Electro Scientific Industries 1953
Oregon Software 1977
Datricon 1979
Basicon 1983
INTEL (OREGON) 1978
Microcosm 1982
Multisoft 1982
Sequent Computer 1983
Lattice Semiconductor 1983
ATEQ 1983
Bipolar Integrated Technology 1983
Metheus 1981
Mentor Graphics 1981
Graphic Software Systems 1982
Integrated Measurement Systems 1983
Planar Systems 1983
Kamerman Labs 1984
Cadic 1984
Magni Systems 1984
Photon Kinetics 1979
Northwest Instrument Systems 1980
Cablebus 1979
Periphicon 1977
Floating Point Systems 1970
TEKTRONIX 1946
Hawthorne Electronics 1948
C-Cor Labs 1983
Cablebus/Pacific Telecom 1983
Pacific Telecom 1983
Aptec Computer Systems 1980
Quantitative Technology 1981
Star Technologies 1981
Sanscript 1983
Support Technologies 1984
Synergy Data Works 1984

high tech firm, currently employing 1,320 workers. Two other Tektronix spin-offs, Mentor Graphics and Metheus Corporation, together employ 450 workers. Although both these firms were only founded in the early 1980's they are accredited with supplying one third of all CAD/CAE equipment used in the U.S. The latest Tektronix "birth", Magni Systems Inc., set up in 1984, produces test equipment for video and television transmission systems and is already finding markets all over the U.S. and Japan (Figure 12.2).

Intel Corporation, an arrival from California in 1976, has been another important source of spin-offs. One, Sequent Computer Systems (Beaverton), set up in 1982, has just won the largest electronics export contract ever recorded in Oregon - to supply scientific computers to Siemens A.G., the West German electrical engineering and electronics corporation. Another, Lattice Semiconductor (Beaverton), spun off in 1983 to make high speed semiconductors, and increased its employment by 25 percent to 150 employees while doubling sales in 1986. Now on the brink of being the first U.S. firm to manufacture a 256K fast static random access memory (RAM) chip, Lattice Semiconductor illustrates the speed with which innovation is occurring amongst new Portland region spin-offs. It is claimed that this new product could fundamentally alter the way super computers are built, vastly increase their speed and decrease their costs per unit calculation (*The Oregonian*, July 27, 1986, p. D1). Yet Lattice concentrates on research and development, testing and marketing in their new Sunset Corridor complex, sub-contracting chip manufacture to Japanese and Californian suppliers.

Entrepreneurial activity and innovation has thus generated an increasingly "information-rich" environment, resembling "Silicon Valley" in some respects and in miniature. Portland entrepreneurs have certainly created a young and vigorous "Silicon Forest".

Figure 12.2: Geneology of high tech industries in Portland. The process began after World War II with the development of Tektronix and Electro Scientific Industries. Employees from these businesses eventually began their own businesses resulting in more and more "spinoffs" producing the multiplicity of firms that now exist.

The In-Movement of High Technology Firms

The most significant new trend in the area's high technology development is in in- migration of out-of-state American-owned and foreign firms. Inward movement has swollen the range and the ranks of new industries in the area during the past decade. Early in the 1970's the corporate managements of two leading American high tech employers -- Data General and Digital Equipment -- decided, after lengthy investigations, not to locate in Oregon. They found the State apathetic. The turning point came in 1976-77 when Silicon Valley-based firms Hewlett Packard and Intel Corporation established plants in Portland to make personal computers, printers, silicon wafers, micro-processors and memory components. Today Intel is the area's second-largest high tech firm, with 3,250 workers. Other U.S. firms followed, such as Spacelabs Inc., a Squibb pharmaceutical subsidiary, making electronic medical monitors; Union Carbide, produc-

ing crystal materials for semi-conductors and polysilicon; and Litton Industries, making aerospace electronics.

The most dramatic change, though, has been the sudden "invasion" in the 1980's by foreign multinationals, locating throughout the metropolitan region. First came Wacker Chemie (Siltronic) from West Germany which now manufactures 35 percent of all American-made silicon wafers. Currently it is extending its operations relocated along the Willamette River by adding the world's largest factory for manufacturing polysilicon, a new substitute for silicon. The presence of such industries is testimony to the way the environmentalist lobby in Oregon has paid off. Output of these products needs clean water in large quantities.

Then came Japanese firms, almost in follow-the-leader fashion, mainly in 1985. SEH America, a subsidiary of Shin-Etsu Handotai Co. Ltd. (Tokyo) making silicon wafers relocated from San Jose to Vancouver (Washington). National Electric Corporation (NEC), the first Japanese company to build a factory in Portland, is spending $25 million on a fibre optics plant for radio and telecommunications. Fujitsu is investing $170 million in two plants, one for making semi-conductors, the other for disk drives. Epson, a Seiko- owned corporation, will assemble computer printers in a $30 million facility. Three of these plants are clustered between U. S. 26, the Sunset Corridor, and the Hillsboro Airport; the Fujitsu microelectronics plant is being built in the east, near Troutdale (Figure 12.1). Just across the Columbia, in Vancouver, Kyocera Northwest Inc., a subsidiary of Kyocera Corporation (Kyoto, Japan) will soon open a semiconductor factory which is expected to supply surface-mounted ceramic capacitor chips to revitalizing markets in aerospace, biomedical, communications and automotive industries, some of which are located in the Pacific Northwest.

WILL THE SILICON FOREST GROW TALL OR SHED ITS LEAVES?

Local entrepreneurship alone explained the growth of high tech industries in the Portland metropolitan region until the late 1970's. Innovators, mostly dedicated Oregonians or immigrants "addicted" to Oregon, neither wanted nor needed to locate elsewhere in the U. S. Initially they found adequate markets in the Pacific Northwest but their products were light, high value, and easily transportable by truck or air to other regions of the country and abroad. A threshold or "critical mass" of manufacturers developed around the base provided by Tektronix, generating sufficient volume and diversity of market needs, components, products, software, information and ideas in a rapidly changing technological field, to act as a magnet for more new entrepreneurial endeavor. The cluster of locally-owned firms created a vigorous business environment for self- sustaining growth and development. But high wages, strict environmental controls, and substantial distance from larger U. S. market regions had in the past discouraged managements of many industries from even considering a location in Oregon.

By the 1980's, however, the shape and form of high tech in Portland was becoming more dependent on increasing numbers of engineers, venture capitalists, and firms being drawn in from more distant regions, particularly from California; and on in-migration of foreign firms. In part, this has been induced by other important changes, especially by increased state and local

initiatives.

State and Local Initiatives: Stimulants to Development

Most fundamental has been a major shift in the attitudes and policies of Oregonians -- largely in response to a deepening crisis caused by declining, even disappearing, staple industries (see Chapter 10). After years of discouraging immigration and investment -- to prevent Oregon from becoming another California -- the State has been forced to court new business. State policies for protecting environment and raising the quality of life, however, have had their positive long term effects in inducing local enterprise.

A strong commitment to excellent State medical and health care, which is virtually free to State employees, has been an important stimulus to localization in Portland of a multitude of medically-orientated high tech firms. Examples are Drake Willcock (artificial kidney machines), Cardiac Resuscitator Corporation (pacemakers), Horizon Laser Systems (ophthalmic laser surgery systems), Life Science Instrumentation (cardiac monitors), Parks Medical Engineering (Diagnostic equipment), National Appliance Co. (biomedical research equipment) or Kirkman Laboratories making dental appliances. Hewlett Packard has a branch in McMinnville, southwest of Portland, making cardio-pulmonary resuscitation and X-ray equipment.

Similarly, State concern for the environment has opened new markets for firms like Harco Manufacturing making water, noise and wood-stove pollution control devices and Grinnell (Lake Oswego) fire protection systems. A large recycling business has developed to serve markets both in Oregon and environmentally-conscious northeastern states. The city is a major center for recycling newsprint, cardboard and glass, which may not be "high-tech" operations, but Oregonian attitudes have acted as "push" and "pull" factors in the innovation of high tech processes and products by existing and new firms. For instance, a division of Tektronix recycles mainly to recover valuable precious metals. In 1984 Environmental Pacific Corporation (EPC) of Lake Oswego was founded to recycle materials from all kinds of batteries. Now EPC makes a wide range of leak-proof steel and plastic containers for transporting hazardous cargo, recycles batteries from as far away as New Jersey, and works at the cutting-edge of technology to re-use plastics. Thus Oregon policy creates comparative advantages for local firms to exploit and deepen the richness of the local information and technology environment.

By contrast, U.S. federal policy has played little role in high tech development in the metropolitan region. While many American high tech centers, including Silicon Valley and Boston, have greatly benefitted from the external stimulus of federal defence spending (Glasmeier, Hall and Markusen, 1985), no major defense-related contracts have ever been placed with Oregon firms. It was recently reported (*The Oregonian*, April 4th, 1986), however, that Floating Point Systems has a new FPS T computer which may be the kind needed in "Star Wars" anti-missile defense systems. If so, history could be changed, depending on Oregon lobbying in Washington and the outcome of superpower agreements on arms control. But on May 8, 1986 the U.S. Department of the Interior closed its Bureau of Mines' Albany Research Center specializing in thermodynamics. Located in the "Oregon high tech corridor" south of Portland -- embracing Salem, Albany, Corvallis and

Eugene -- the laboratory was a major promoter of high tech metallurgy processes locally, not least for PCC. Not surprisingly, many Oregonians believe that there is longstanding and deepening federal discrimination against their state.

Since the late 1970's state and local authorities in Oregon have replaced apathy towards to downright discouragement of businesses, by vigorous campaigning for clean industry combined with plans for careful environmental management and improvement. Policies are now orientated to stimulating new industrial development and have taken several forms:

(i) Delegations of Oregonians have visited East Asia, especially Japan, to recruit firms by selling the advantages of industrial location in Oregon. With the further objective of securing major export contracts for both staple and high tech manufacturers, Oregon officials have "twinned" their State with the Province of Fujian, China, in the coastal zone lying between Shanghai and Guangzhou (formerly Canton), an area favored as a "forward zone" for Den Xiaoping's economic modernization program. Portlanders who, for a century, have romanticized about their city as the "Gateway to the Orient" are now endeavouring to turn it into economic reality. One trade delegation to Tokyo in 1984 produced the promises of investment by NEC, Fujitsu and Epson -- provided that Oregon reform its tax system on multinational corporations. The State obliged. And in March 1986 a Keidanren delegation of leading Japanese businessmen toured sites in the Portland area.

(ii) Repeal, in August 1984, of the state's unitary tax laws replaced a levy on the worldwide business of any multinational located in the state by a tax only on its Oregon operations. This measure "opened the gates" to foreign investors, particularly those Japanese firms which, up until now, had refused to locate plants in the U.S. states, of which there are 11 including California, that still retain the unitary tax system. Following the repeal all the promised investments from Japan became building operations and Wacker Siltronic decided to go ahead with the addition of its polysilicon plant.

Less easy to assess is the effect of Oregon's lack of a sales tax (one of the few states so remaining). Introduction of such a tax was rejected by the Oregon legislature in 1985. Big retail shopping centers and what is reputed to be America's largest Safeway supermarket are located on the Portland side of the Columbia to tap the Washington consumer market (which has a sales tax). But that may have far less tangible effects on the growth of high tech (or other) industries because, in contrast to most states, Oregon still does not offer financial incentives to induce business to the State: Oregonians prefer to advertise its superior environmental advantages, natural beauty, and quality of life. Opinions have been expressed, though, that Washington state uses monetary inducements to firms like Kyocera, SEH America, Hewlett-Packard, Union Carbide, RCA and Sharp to locate in Vancouver while employees enjoy the same access to Oregon's environment!

(iii) Adoption and implementation of land use plans to zone commercial, industrial, residential and transport functions in the area enable local authorities, in former Governor Victor Atiyeh's words, "to combine development with environmental quality." This is particularly critical in suburbs west of Portland where, almost repeating history of the Oregon Trail, the Tualatin Valley has become the most desirable

settlement zone - this time for high tech industries, and their employees. Original firms like Tektronix quickly outgrew their central or inner city sites, especially the "incubator zone" of the central east side, relocating to the western semi-rural fringes in and around Beaverton, today a thriving suburb and the very hub of the "high tech corridor" (Figure 12.1).

In 1981 Washington County adopted the "Sunset West" Plan for the zone along U.S. 26, a route long called the Sunset Corridor leading out of Portland to the coast. The name today is paradoxical since it hosts increasing numbers of "sunrise" industries. The Sunset West plan, collaborated through the Tualatin Valley Economic Development Corporation with plans for adjacent parts of Clackamas and Multnomah counties, embraces two-thirds of the buildable land within the metropolitan region and so holds the key to its economic future. Plans seek to sustain the very high environmental standards already set by Oregon entrepreneurs and residential developers in creating distinctive landscaping styles of attractive buildings sited to preserve groves of oaks and firs, with office or house windows facing snow-capped Mount Hood on the eastern skyline.

An important role in marketing and managing land is played by the Port of Portland (see Chapter 11). Owning half the available industrial land in the Rose City, a quarter of that in the entire metropolitan region, the Port coordinates the architectural and landscaping laying out of manufacturing, science, research and development and warehousing parks with improvements in the handling capabilities of the riverport and city's three airports (Portland International, Hillsboro and Troutdale) which the Port of Portland also owns and manages. And recently, the I-5 Corridor Association has launched a major campaign to advertise the advantages of the zone embracing Tigard, Lake Oswego, Wilsonville and Aurora around the I-5, I-205 and I-217 interchanges.

In contrast to the congestion of the San Francisco Bay area or Los Angeles, the ability to provide attractive living and working environments in Portland within one or two hours' easy drive of dense forest, majestic mountains, fish-filled rivers, an imposing coast of cliffs and sandy beaches, Indian reservation resorts, and desert, is clearly an extremely powerful locational incentive to businessmen who put a high premium on the quality of life.

(iv) At the region's very heart, the City of Portland is strenuously improving the national and international magnetism of the Silicon Forest. To uphold the image of the "Rose City", "America's most livable city," and to avoid the fate suffered by so many U.S. cities with dying or decaying downtown areas, the City has raised and spent $1.25 billion in the central district since 1970 (see Chapter 4). Attractive new residential developments rise near a waterside park and marina which replaced the scruffy riverside highway along the Willamette River in the early 1970's. Squares combine architecturally exciting public and private office buildings and open spaces with pavement cafes, trees and cascading waterfalls. Major hotels have been joined by a Performing Arts Center, a Civic Auditorium, an expanded or restored historic Old Town resembling London's Covent Garden, and a restored "Chinatown," attract tourists and Portlanders alike. Finally, a central transit mall on SW 5th and 6th Avenues, reserved only for buses and pedestrians, has been adorned with

domed bus shelters, trees, flower beds, rose baskets, cafes and statues, to re-create the appearance and atmosphere of the Parisian boulevards.

Major attention has been paid to improved public transport. An extensive "Tri-Met" bus network offers frequent and relatively inexpensive services, with completely free travel in the downtown "Fareless Square." Construction of a fast light rail system (MAX) from the outermost eastern suburb of Gresham to downtown Portland, a distance of 12 miles, is the latest attempt to make the central city highly accessible.

Such developments partly explain why employment in central Portland has doubled in the last 15 years to 85,000 jobs today. City officials and local businessmen hope this will further attract major corporations. Recent decisions by Eastman Kodak, Honeywell, Westinghouse Electric and major insurance firms like Prudential, Philadelphia Life, and Sun Life of Canada, to set up their Pacific Northwest offices at Johns Landing beside the Willamette near the downtown are signs that Portland is becoming a "regional headquarters city," a trend which could strengthen its pull on high tech industry and services.

Very relevant to these aspirations is that Portland now offers extensive land sites (greater than 3,000 acres) ready for industrial development beside deepwater port installations along the Columbia and Willamette Rivers as well as 130 industrial and business park sites (ranging from 5 to 500 acres). As the only significant metropolis between San Francisco and Seattle and one of only five major "Pacific Rim" gateways along the U.S. west coast, Portland may be able to exploit outstanding "intervening opportunities" to become a major crossroads, tapping business along the north-south Alaska-California and east-west U.S. Eastern Seaboard-Pacific routes.

CONSTRAINTS ON HIGH TECH DEVELOPMENT?

The foregoing factors operate simultaneously with worsening problems in California to tip the balance of advantages for high tech industries more positively toward the Silicon Forest. But there are several reasons why Portlanders cannot be complacent about the inevitability of high tech growth in their region. This has been recognized, for instance, by the Bonneville Power Authority which in 1983 predicted that Oregon's high tech would employ 180,000 people by 2005, but has since revised that estimate substantially downward to between 100,000 and 140,000. Any of these figures could be over-optimistic because of: rising land values, alternative locational opportunities elsewhere for high tech development, competition and business cycles, and constraints in local labor markets, venture capital supplies, and educational facilities.

Land Values

Escalating land and housing costs around Silicon Valley and increasingly lengthy and time-consuming commuting for workers are prime factors pushing Santa Clara Valley businessmen to "seek greener pastures." Some are finding them in Oregon. Thus Portland may be able to siphon off some high tech from other areas. Good homes in less crowded surroundings sell at one-third to one-half the prices of those in comparable areas of California. Several engineers have sold their San Francisco Bay area homes, bought new ones in Oregon, using the capital saved to start their own high tech businesses. These are just the kind of people that Oregon officials wish to attract because they "import" the newest technologies to

the Silicon Forest, adding to its vigor and diversity. Of course, not all this growth is occurring in the Portland area. There are other clusters of high tech around Eugene and Salem, and in the Medford-Ashland area near the California border where research support can come from the Oregon Institute of Technology at Klamath Falls.

The influx of engineers and firms into the Silicon Forest is, of course, already having important local repercussions on the demand for land. Prices are rising fast, bringing other changes in their wake. Tualatin Valley grain farmers are under increasing pressure to sell their land. So, too, are the filbert producers who have no serious world market rivals except for Turkey. Some rural landscapes will become estates or industrial and science parks within the framework of the Sunset West plan. Yet some small, rundown settlements, like Orenco, which are more accessible to the western high tech corridor are also being revitalized.

The Potential for Relocation and Locational Displacement

Much doubt hangs over the value of drawing away from California industries such as Hewlett-Packard's calculator-assembly plant located in Corvallis. That kind of operation essentially creates semi-skilled jobs in standardized goods output which is highly susceptible to short-term cyclical fluctuations, rapid obsolescence, or medium-term relocation to very much lower labor cost regions. The "Gateway to the Orient" in this sense means a drain of manufacturing jobs across the Pacific to Asia. An example is Code- A-Phone Corporation (Clackamas), founded in 1958 to make answer phone devices. Since the divestiture of American Telephone and Telegraph Co. (AT&T) in 1983, Code-A-Phone's sales have doubled and now account for 15 percent of the U.S. market, but the manufacturing of the latest machines has been transferred to Japan and South Korea.

On the other hand, investments by Japanese firms in Portland, e.g., NEC, Fujitsu and Epson may merely be diversions from California only so long as it retains unitary taxes. Time will tell whether the in-migration of Japanese firms is going to be sustained. There could be stagnation in Oregon high tech investment by foreign firms, though probably not in "raw materials" production of silicon, polysilicon and other substitutes (such as gallium arsenide) in which Oregon seems to have a comparative advantage. The currently high exchange value of the yen against the dollar may accelerate relocation of production from Japan to the U.S.A., a process in which Portland may share. But, in any case, such growth or inward movement depends very much on the absorption capacities of the U.S. and world markets for high tech final products, an issue discussed below.

Labor Markets

It is unclear as to how far either the number of jobs created in high tech industries, or the levels of remuneration and skill engendered, can truly compensate for jobs already lost or about to be lost in the region's traditional industries. For instance, in July 1985 Recording Corporation of American (RCA) and Sharp (Japan) announced a joint venture to bring 700 jobs by 1989 and 2,000 by 1995 to the Vancouver-Camas area along the Columbia River. But this would not have compensated for the 2,500 jobs last by the threatened closure of the Crown Zellerbach paper mill. Yet in announcing their plan RCA and Sharp made it clear that they

would bring in highly skilled electronics workers from other regions because many Camas paper mill workers would be unsuited even to retraining for the new jobs. By contrast, Fujitsu managers claim that they can turn loggers successfully into high-tech workers! Only time will tell if they are simply trying to "blind" Oregonians to reality.

Perusal of job advertisements provides evidence that, with the exceptions of highly- paid executive and research and development positions, most high-tech workers can only expect poor pay ($12,000 to $30,000 per annum) compared with recent wages of up to $55,000 per annum in mining, logging, paper making and other regional "staples". Under these conditions it may not be surprising if some formerly highly-paid workers from traditional industries choose not to work in high tech. Labor supplies in the metropolitan area, however, are unlikely to constrain new development, even in highly-skilled functions, for reasons outlined below.

Competition and Cycles in High Tech Business

What makes the benefits of high tech employment even more doubtful is the strongly cyclical and highly competitive nature of the industry. There is already much overcapacity in some final products markets, with feedback effects on the demand for the "raw materials and energy" inputs, especially of microchips. The world has been experiencing a major "microchip war" between Japanese and American firms. Their factories are operating at only about 70 percent capacity. Although some agreement has been reached by the two countries on this issue, no guarantees can be given that the new generation of semiconductors to be produced by Lattice Semiconductor, for instance, will not be susceptible to similar problems in the shorter term, given the accelerated pace of innovation. Moreover, there are high levels of automation and use of numerically-controlled machines in the production of semiconductors, not only with limited job-creation capacity, but also with a significant propensity for new development in newly industrializing countries of East and Southeast Asia.

Several examples from the experiences of the metropolitan region in the past two years well illustrate these problems. Since January 1985 Tektronix had laid-off 1,500 workers, affecting several facilities in Portland, while Intel Corporation has shed more than 1,000 jobs, involving closure of a plant in Aloha. Both are a response to depression in, and saturation of, the world computer market. The same difficulties have slowed construction of Kyocera Northwest Inc.'s chip factory in Vancouver and postponed indefinitely its plan for a research and development unit there. National Semiconductor, a Silicon Valley headquartered firm, potentially one of Portland's largest newcomers, recently abandoned plans to build a $150 million research and development laboratory and 32-bit chip factory in Hillsboro. Most dramatic was the 10 July 1986 cancellation of the proposed U.S.-Japanese joint venture, the Camas semiconductor manufacturing plant and research and development unit. In this case, General Electric's December 1985 acquisition of RCA doomed the project; GE had already commissioned an expensive state-of-the-art plant for similar microchip production in North Carolina's Research Triangle and wanted to eliminate potential competition from a rival U.S. firm which had Japanese backing. Severe competition is thus occurring between regions concentrating high tech within the U.S.A. Finally, one

of the metropolitan region's leading high tech manufacturers, Floating Point Systems, has suffered serious devaluation of its stock market rating following the announcement of reduced revenue earnings. These ensued from budgetary cutbacks by commercial, academic and government organizations which restricted the market for high- speed scientific and engineering computers.

Venture Capital

Another worry concerns the role of venture capital as a possible constraint on the development of Portland's high tech industry. Unlike San Francisco or Seattle, Portland is not a major banking and financial center or a source of venture capital which has been so instrumental in taking the risks and supporting the high tech successes, for instance, of Boston or Santa Clara Valley. Portland firms must obtain their venture capital primarily from outside the state. Indeed, Magni Systems Inc., raised capital in 1986 from a combination of sources in Portland, Silicon Valley, and Tokyo. Some Oregonians, with typical business caution, are questioning the extent to which even the limited venture capitalists seek to maximize the speed and scale of their profits and, in so doing, propel high tech firms through short "boom-and-bust" life cycles. Then, too, some entrepreneurs may welcome such pressures because they might be in business to "get rich quick," without either care for local economic health or any commitment to the long-term utility of the product they are making.

In an effort to reduce some of these negative features, the State began in 1985 to use 20 percent of the $88 million revenue raised by its new lottery for venture capital and to make careful selection of the recipient companies. Picking likely "winners," however, is risky, but Oregonians generally seem to accept the use of some of their lottery money for the good causes of job and business generation. To assist in this process, The Northwest Financial Symposium for Emerging Companies is offering an annual forum for firms to present their cases to groups of venture capitalists from all over the U.S.A. Having helped firms like Lattice Semiconductor and Metheus Corporation to obtain capital in the past, there is optimism for Portland's future.

Educational and Training Facilities

Finally, there is a view that neither Portland nor Oregon and southwest Washington can match the quality and quantity of educational facilities that have contributed to the high tech leadership of the Boston and San Francisco Bay areas. Nor, some admit, do they match the educational facilities that are key ingredients in growth in North Carolina's "Research Triangle," Colorado's "Silicon Mountain" or Texas' "Silicon Prairie." Thus capital from Tektronix and other leading Portland firms has established the Oregon Graduate Center (OGC) as a private non-profit educational institution on the cutting edge of research in physical and biological sciences, engineering and electronics. Recently it spearheaded the development of the OGC Science Park in the Sunset Corridor to combine research and to expand high tech manufacturing. Planar Systems and Bipolar Integrated Technologies Inc., both local spin-offs, are its first occupants.

Moreover, electrical engineering and other science departments at Oregon State University (Corvallis), the University of Oregon (Eugene) and Portland State University, once rivals, are now collaborating to pool knowledge, to under-

take key research and to develop or intensify links with business. Great store is being placed on their capabilities, for instance, to innovate economic production of gallium arsenide by a local firm on a sufficient scale to gain a world comparative advantage in what is now known as the major substitute for silicon. They may have already "missed the ship"; Hughes Aircraft Company recently announced the development of a gallium arsenide chip in California (*Far Eastern Economic Review*, October 17, 1986).

Moves are also afoot to upgrade Portland State University - with an Advanced Technologies Institute, International Center for Trade and Commerce, and Urban Studies and Geography Departments -- into a more effective force in fostering, understanding and predicting the role of high tech activities in the daily lives and work of the people of Oregon and the Pacific Northwest. With so much innovation and drive amongst the area's high tech entrepreneurs the future appears to bode very well indeed.

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Chapter 13
Portland: The Most Livable City?

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A visitor to Portland from the frenetic East coast would be impressed immediately by its relaxed pace. It is a city that "has never bustled. It doesn't today. It ambles . . . with some loitering along the way" (O'Donnell and Vaughan, 1976, p. 9). In 1947, however, journalist and former senator Richard Neuberger was concerned that Portland's "general quietude" and "leisurely meandering" might come to an end. He viewed Portland as "poised indecisively between its pastoral past and a future which the late President [F.D.] Roosevelt once prophesied might be that of 'a new Pittsburgh of the West'" (Neuberger, 1947, p. 23). Has Portland been able to retain its "pastoral past" while growing into a metropolitan area of over a million people? Or has it become another Pittsburgh, which ironically ranked in 1985 as the most livable city in Boyer and Savageau's (1985) *Places Rated Almanac*? How does the quality of life in Portland compare with other cities in the United States?

WHAT IS LIVABILITY?

Attempts to compare the well-being or quality of life in American cities have a history dating back to at least 1939, when the psychologist E.L. Thorndike wrote *Your City*. Thorndike developed indices of the "general goodness of life for good people" that included health (largely mortality rates), education expenditures and school attendance, recreation expenditures, poverty and unemployment rates, and "creature comforts". Portland ranked 42nd, tied for 15th place, out of the 310 cities. Thorndike's approach clearly favored the upper-middle class suburbs of the day: Pasadena, Berkeley, Cleveland Heights, Brookline, MA, and Evanston and Oak Park, IL were top rated.

In 1976 Portland received national attention when Ben-Chieh Liu, a geographer with the Midwest Research Institute, ranked Portland at the top in a monograph comparing the quality of life in 65 American cities (Liu, 1975). His rankings were based on five sets of indicators of the economic, political, and social characteristics of each city, the quality of the health/education system and the quality of the environment; Portland was the only city receiving an "A" rating in all five categories. More recently, Boyer and Savageau's 1985 edition of *Places Rated Almanac* ranked Portland 63rd among the 329 cities rated.

These are only three from a long list of empirical studies comparing cities. Has Portland changed, or are the differences among studies due to differences in the rating systems? The answer is more likely to lie in the rating systems. In trying to resolve the differences between the studies, a number of

methodological issues arise.

First, some of the studies use data for only the incorporated city while others use the standard metropolitan statistical area (SMSA) composed of the county in which the city is located and the surrounding counties that are economically interdependent. Cities vary widely in the degree to which their suburbs have been incorporated into the city. Those which have incorporated more of their surrounding area will generally have more favorable social indicators because the more affluent part of the population is included.

Second, studies differ in their choice of indicators, and in how these are weighted in developing a composite score. The studies generally lack a component that asks residents what *they* think is important in judging the livability of a city. Robert N. Pierce, a geographer at the State University of New York at Cortland, (Associated Press, 1984) did ask what potential residents considered the most important factors in choosing a city in which to live, using a sample of New York State residents. When he used the importance they placed on various indicators to recompute the city ratings from Boyer and Savageau's data, Portland moved from 62nd to 13th place.

Another approach to assessing the importance of objective indicators is to determine how well each indicator is able to predict people's "well being" or "life satisfaction". It appears, however, that people's life satisfaction is much more a function of their private lives, e.g, their marriage and family, than of those aspects of life over which the public sector has control (Milbrath, 1979; Campbell, Converse and Rodgers, 1976). Thus, the characteristics that vary among cities (such as quality of the environment or education system) may not be the major determinants of perceived quality of life.

Third, different segments of the population are likely to have somewhat different values and thus attitudes toward livability. A city that is wonderful for the well-educated is not necessarily good for the poor. Those things that most contribute to satisfaction with geographical location vary as we move through the stages of life, and vary by social status, gender, and cultural background. Is it more important to have an excellent opera or a professional football team? Lakes for boating or mountains for climbing? We would not all agree. So any attempt to capture the livability of a city in a single score, regardless of how derived, is an oversimplification.

IMPRESSIONS OF PORTLAND

Recognizing these problems, we will nevertheless try to characterize Portland in terms of both objective and subjective measures. For the subjective we have tried to capture what Portland residents think is unique about their city, and also what aspects most contribute to, or detract from its livability. A short questionnaire was sent to 50 members of the City Club, a civic organization engaged in studying a wide variety of local issues. Although admittedly unrepresentative of the population as a whole, the sample does tap a particularly knowledgeable and well-travelled group. Respondents were asked to describe Portland and to comment on both its unique or distinctive features and those that make Portland a particularly good or poor place to live. Forty people responded (Table 13.1).

The subjective impressions of Portland focus on somewhat different

Table 13.1: *Subjective impressions of Portland, from questionnaire responses of 40 Portland City Club members.*

Categories of Responses	Number of Responses	
	Positive/Neutral	Negative
Physical Environment		
Geography or location	36	1
Aesthetics, architecture	15	0
Size or density	27	0
Environment and scenery	26	1
Downtown vitality	11	1
Climate	12	8
Social Environment		
Characteristics of the people	19	8
Ambience (provinciality, formality, etc.)	24	10
Crime or safety	1	2
Education system	7	1
Government and politics	29	7
Neighborhoods	14	3
Social, political openness	12	0
Economic climate	11	15
Transportation	9	1
Health and health care	1	0
Arts and Recreation		
Organized sports	0	1
Outdoor recreation	13	0
Arts and entertainment	9	5
Openness to change, innovation	2	0

characteristics than those usually included in quantitative measures of city quality. Portland's physical environment generated the most positive comments -- the diversity of its surrounding environment; its size, reflecting the amenities of a large city as well as a small town atmosphere; its scenic setting. In the social environment the strongest impression is of the honest, open political climate and the informal, slow-paced ambience of the city. The negatives center on the poor economic conditions in recent years, the provincial populace, and the wet climate.

A number of aspects that constitute the uniqueness of Portland are not captured by the objective data relied upon by Liu (1975), Boyer and Savageau (1985) and others. Although the responses may be skewed somewhat by the sample, i.e., the City Club members may be more aware of and interested in the political climate than most Portlanders, the responses were surprisingly consistent. Several themes appeared that cut across a number of categories. The first of these is moderation. Portland was described as moderate in size, climate, political activity, and in the pace of life.

The second recurring theme is of accessibility. The accessibility of natural beauty and recreational opportunities in the mountains, the seashore, and the desert was mentioned often. But

Portland is also seen as a city in which people can easily become involved in social and civic affairs. The social, political, and business worlds are all described as "open". This accessibility extends to the transportation system; the city is easy to get around in both by car and on foot.

THE PHYSICAL ENVIRONMENT

One of the problems with over-all scales that attempt to compare all cities on the same measures is that they do not capture the possibility that being truly outstanding in one area may outweigh many negatives. For New York, the outstanding element is the diversity and excitement of the city's cultural life. For Portland, judging from the City Club members' responses, it is the geographic location of the city, and the city's scenic beauty and recreational opportunities. One person characterized the city as "an island of urbanization in a region of wild scenic beauty". In the following sections we review how Portland ranks in some of the social indicators commonly used in livability studies, with an emphasis on those which are particularly characteristic of the city.

Aesthetics

Two ingredients in determining the aesthetic character of Portland will be discussed: imageability and urban design.

Imageability

The MIT planner Kevin Lynch (1960) argued that imageable cities are beautiful cities. By imageability he meant the extent to which the city structure was easy to comprehend--how easy is it to know where you are, to get from one place to another, to visualize the form of the city? An imageable city, then, is one in which there are districts with clear identities, and a system of landmarks, activity nodes, pathways and edges that work together to create a comprehensible whole.

If you were spirited to Portland in the middle of the night, how would you know where you were? Characteristic of the Pacific Northwest are the tall Douglas Fir trees, and the wooden frame houses (brick and stucco are relatively uncommon). The terrain is river valley with lines of hills punctuated by the small volcanic cones (see Chapter 1) and in the distance the towering volcanic peaks of the Cascades. The weather would likely be mild: relatively dry summers and cool, damp winters with rain coming in mists rather than sheets. The symbol of Portland is the rose, and indeed the climate is ideal for a diversity of shrubs and flowers.

By combining a recent report on the imageability of Portland (Harrison, 1977) and our own observations together with Lynch's (1960) framework, the city's image is defined first of all by the edges provided by natural features: the Tualatin Hills to the west and the Willamette River to the east define the downtown district, which nestles into an area of only two to three square miles. There are other districts that are also well-defined, neighborhoods such as Ladd's Addition, Laurelhurst and others that were platted early in the century and stand out in the area east of the Willamette River due to their housing styles, their break from the grid street pattern, and their solidly residential character (see Chapter 5). The grid street pattern through most of the city is predictable and has the added advantage of allowing vistas. The west side is somewhat less imageable due to the more rugged terrain and the irregular road patterns.

The primary activity node of the downtown area is Pioneer Courthouse Square. This square is located at what has been called the 100 percent location -- the activity and symbolic center of the city (Whyte, 1980). The square was completed in 1984, replacing a two-story parking lot. Although it has generated some controversy because local youth immediately began to congregate there, it has also become a natural gathering place for the city, for the lunchtime crowd, and for those who drop in for outdoor concerts and festivals.

There are also many visual landmarks. The Interstate Bank and US National Bank towers essentially form bookends at the north and south edges of downtown, since they loom above buildings conforming to the more recent height limitations. Michael Graves' Portland Building is a gaily gift-wrapped post-modern temple generating controversy in architectural circles nationwide -- but definitely a visual landmark.

Urban design

San Francisco-based landscape architect Lawrence Halprin (1986a) refers to Portland as "one of the greatest cities in the world". Why? He likes (and has had a part in creating) the network of open spaces in the downtown area. He speaks of Portland's "pedestrian network -- a network of places, interesting walkways, like pearls in a necklace" (Halprin, 1986b). Among these are the squares and fountains he created in the late 1960's (Ira Keller Fountain facing the Civic Auditorium and Lovejoy Fountain in the Portland Center redevelopment area), as well as the new Pioneer Courthouse Square, and the transit mall running through downtown that is floored with brick and furnished with benches, flowers, and sculptures.

A recent issue of *Architecture*, the journal of the American Institute of Architects, featured Portland as an example of innovative approach to urban design (Canty, 1986). The city's Downtown Plan, adopted in the mid-1970's and the work of the Portland Development Commission have remade the downtown in the last decade. Harbor Drive, a four-lane expressway along the west bank of the river was demolished, the waterfront park expanded and refurbished, and new development begun -- e.g. RiverPlace, a low-rise development of apartments, a hotel, restaurants, shops, and a marina (see Chapter 3). Thus the plan has created better access to and visibility of the river, the most basic element in the imageability of the city. Amidst much new construction, the city has also made extensive efforts to conserve and find creative re-uses for older downtown buildings in historic districts: Skidmore-Old Town, and Yamhill. Boston architect Joan Goody, comparing Portland and Seattle, says "there's a much greater sense of order here. The old and even the new are built in a framework that still holds together" (Hayakawa, 1986).

Climate

The climate of Portland is generally quite mild (Figure 13.1). Boyer and Savageau (1985) rank the city as 16th in overall pleasantness of climate among the 329 cities ranked. Only January is classified as winter using their definition of the period during which the mean monthly low temperature is below freezing. In an average year, Portland receives one or more inches of snow only twice. Summer is also mild--it ties for fifth place with Portland, Maine as having one of the

Portland, OR

Terrain: Situated 65 miles inland from the Pacific Ocean and midway between the northerly oriented low Coast Ranges on the west and the higher Cascade Range on the east, each 30 miles distant. The long growing season, with its mild temperatures and ample moisture, favors local nursery and seed industries.

Climate: A rain climate in winter, marked by relatively mild temperatures and cloudy skies. Summers are pleasantly mild with northwesterly winds and very little precipitation. Fall and spring are transitional in nature. Fog occurs frequently in fall and winter. At all times, incursions of marine air are a moderating influence. Extremes in winter and summer come from the continental interior. Destructive winds are infrequent.

Pluses: Short winters; long, pleasant summers; ample precipitation.

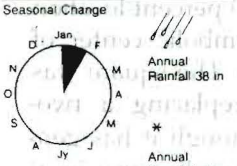
Minuses: Daily rains during winter and part of spring; often cloudy.

Places Rated Score: 768 **Places Rated Rank: 16**

Elevation: 39 feet

Relative Humidity: 74%
Wind Speed: 7.8 mph

Seasonal Change



Annual Rainfall 38 in

Annual Snowfall 7 in

Clear 69 days | Partly Cloudy 68 days | Cloudy 228 days

Precipitation Days: 152 Storm Days: 7

Average Temperatures

	Daily High	Daily Low	Monthly Mean
January	43.6	32.5	38.1
February	50.1	35.5	42.8
March	54.3	37.0	45.7
April	60.3	40.8	50.6
May	67.0	46.3	56.7
June	72.1	51.8	62.0
July	79.0	55.2	67.1
August	78.1	55.0	66.6
September	73.9	50.5	62.2
October	62.9	44.7	53.8
November	52.1	38.5	45.3
December	46.0	35.3	40.7

Zero-Degree Days: 0
Freezing Days: 44
90-Degree Days: 10
Heating- and Cooling-Degree Days: 5,092

Figure 13.1 A summary of Portland's climate (Boyer and Savageau, 1985, p. 46).

coolest average daily high temperatures in July. Only four of the 80 indicator cities are cooler than Portland's average high of 79°F: Seattle (76°), San Diego (75°), Anchorage (66°), and San Francisco (64°) (Bowman, Giuliani, and Minge, 1981). Another index of summer comfort is the "sweat factor", an index of temperature and humidity. Portland ties for fifth among the 74 cities ranked in this comfort rating (Bowman, Giuliani, and Mirge, 1981).

Weather extremes are generally rare. Portland is tied for second place with nine other cities in scarcity of tornadoes, there are no hurricanes, and relatively few thunderstorms (Bowman, Giuliani, and Mirge, 1981). Ice storms in the winter are more likely, as the cold east wind through the Columbia Gorge meets the warm marine air, turning rain to freezing rain (see Chapter 2). Midwesterners are alternately amused and annoyed as they find the city closing schools and generally coming to a halt after a light snowfall.

The most famous part of Oregon's climate is the rain. If one looks only at the amount of rain -- 38 inches in Portland -- the image of rusting Oregon residents is puzzling. Many cities meet or exceed that average, including New York, Boston, and Miami. But Portland's rain falls as mist or drizzle, not as thunderstorms. Thus, the number of days in which it rains .01 inches or more is 154, a number exceeded only by Cleveland, Rochester, and Buffalo among 80 indicator cities (Bowman, Guiliani, and Minge, 1981). Portland also ranks low in the percentage of sunny days (48 percent); only Akron, Anchorage, Seattle, and Pittsburgh have more cloudy days.

Of course, the mist and mild climate are excellent for vegetation. A number of our City Club respondents were willing to endure the rain for the lushness that accompanied it: "a big plus -- springtime -- it may be wet but I love the camellias, rhododendrons and azaleas". Horticultural maps show the growing climate to be similar to the Carolinas and the central parts of the Deep South, despite sharing the same latitude as Minneapolis and northern Maine.

Environmental Quality

Air and water pollution

How good is Portland's drinking water? According to Marlin and Avery (1983), the water is exceptionally soft (ranked at the top of 69 cities) with a neutral pH of 7.0 (ranked second among 51 cities), and clear (ranked second among 63 cities). Ranging from .4 micrograms per liter of suspected carcinogens in Fresno to 250 in Houston, Portland's water supply, with only 20, is the 12th among the 52 cities ranked (Bowman, Giuliani, and Minge 1981).

With the occasional exception of carbon monoxide levels, the air in Portland is safe to breathe. According to a report by the Environmental Protection Agency (Office of Air Quality Planning and Standards, 1985), Portland meets National Ambient Air Quality Standards for suspended particulates, sulfur dioxide, nitrogen dioxide, ozone, and lead but has unacceptable amounts of carbon monoxide. Compared with 22 SMSAs of comparable size (1-2 million) in 1983, the Portland metro area ranked as the fourth worst in the concentration of carbon monoxide in the air.

There have also been great fluctuations in the levels of suspended particulates. Compared with 22 SMSAs of comparable size, Portland ranked as the fifth worst in 1981 but then jumped to the second best in 1983. Between 1980 and 1983 there has been an approximately 47 percent drop in suspended particulates, more than double the national decline of 22 percent. This decline was partly due to the closing of a carborundum plant in Vancouver, Washington, but it also reflects an artificially high level in 1980 caused by the fallout from Mt. St. Helens. In 1980, the volcanic eruption blanketed the Portland area with hazardous ash, elevating suspended particulate levels.

Allergens

For allergy sufferers, the Portland environment can create severe discomfort. The Willamette Valley has been called the "Sneeze Capital of the Country" by *Oregon Magazine*. They quote Dr. Emil Bardana (1986), allergy specialist at Oregon Health Sciences University, who says "the Willamette Valley has more grass pollen than anywhere else in the world." He notes that "weed pollen, tree pollen, molds, house dust and mites are also common allergens". However, Portland has little ragweed pollen, based on a Ragweed Pollen Index devised by The American Academy of Allergy (Boyer and Savageau, 1985). Although ragweed flourishes in such Midwestern and Eastern cities as Chicago, Cincinnati, Rochester, and Philadelphia, western cities are relatively free from ragweed pollen.

Environmental consciousness

Oregon has a reputation for environmental consciousness. According to a study by the Conservation Foundation, it ranks fifth among states in its effort to protect the environment and the quality of land use (Duerksen, 1983). The Foundation rated states on 23 environmental and land-use indicators ranging from "voting records of a state's congressional delegation on selected national environmental issues to existence of state laws that address specific environmental problems. The overall focus was on regulatory programs and expenditures for environmental quality" (Duerksen, 1983, p. 218). In addition to Oregon, the other states ranked in the top five were Minnesota, California, New Jersey, and Massa-

chusetts. Although these were state rather than city ratings, the Portland area supports environmental controls more strongly than the rest of the state. In the late 1960's, under Governor Tom McCall's leadership, the state made a major commitment to cleansing the Willamette River and reclaiming its banks as a "greenway" with public access. The redevelopment of the river front in downtown Portland is part of this process (see Chapter 3). Other legislation that has been at the forefront nationally is the requirement that bottles be recycled (1971), the establishment of the Land Conservation and Development Commission requiring statewide land use planning that meets state goals (1973; the first such planning body in the nation), state and city of Portland noise control regulations (1974 and 1976 respectively), and most recently pollution standards for wood stoves (1986).

Looking at environmental consciousness at a more individual level, Kathy Ferguson (1986) measured environmental consciousness as it is reflected in membership rates per capita in ten environment organizations, e.g., the Wilderness Society, Defenders of Wildlife, and Environmental Defense Council. Oregon tied for third with Connecticut

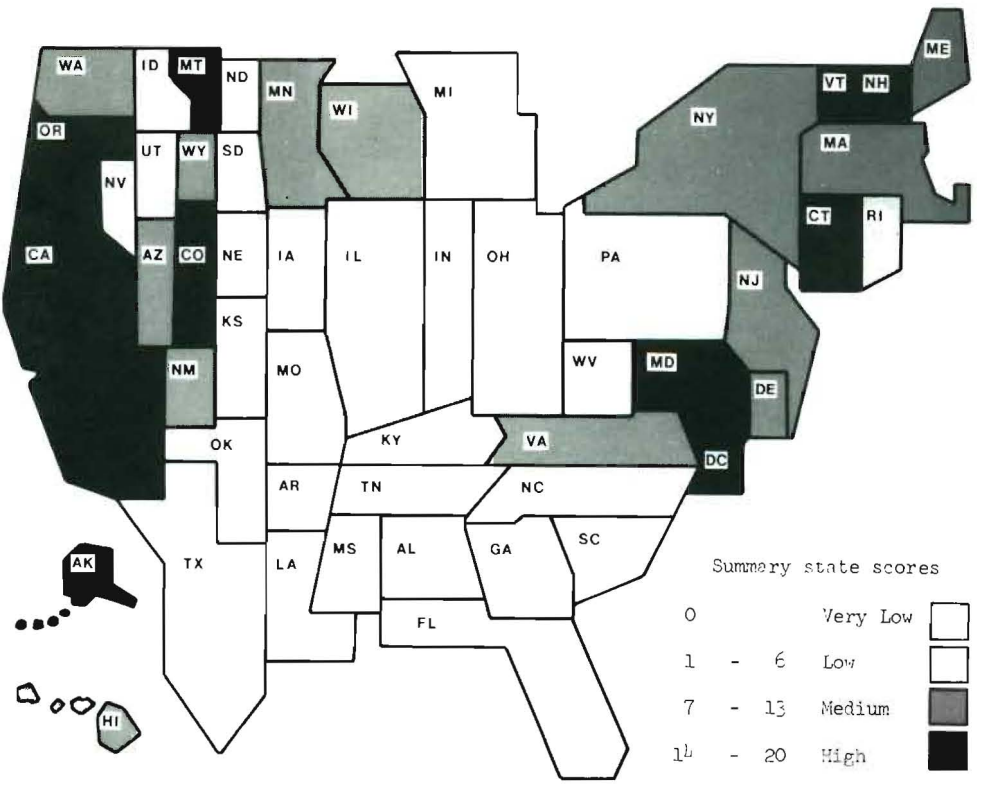


Figure 13.2 State scores on the percentage of population who were members of ten national environmental organizations in 1984. State size has been graphically distorted to reflect the relative size of its population (Ferguson, 1985, p. 90).

and New Hampshire, and was particularly high in membership in Sierra Club, Friends of the Earth, and the Audubon Society (see Figure 13.2). It is not surprising that a city whose populace rates its access to the outdoors as its most distinctively positive feature is also actively involved in preserving that environment.

THE SOCIAL ENVIRONMENT

Demographic Characteristics

Who are Portlanders? In a study of the demographic characteristics of the 100 largest U.S. cities, Portland is ranked as the 35th largest city (Robey, 1985). An inspection of Table 13.2 reveals its relative homogeneity. Several of our City Club respondents identified the lack of ethnic diversity as a drawback to living in Portland. There are relatively few black or Hispanic residents. There is a relatively high proportion of foreign born residents, perhaps accounted for by the high percentage of Asians and Pacific Islanders (ranked 14th out of 94 cities; Marlin and Avery, 1983). Residents are more likely to be older and more highly educated than the average urbanite, and are less likely to live in a household that includes a married couple. Economically, Portlanders tend to be somewhat better off than average, but it is not a wealthy city (Table 13.2).

Crime and Safety

Despite its longstanding reputation for livability, the data surprisingly portray Portland as a city ridden with crime. According to 1985 F.B.I. Uniform

Table 13.2: *Demographic characteristics of Portland, indicating the rank order and number of cities ranked for each characteristic.*

Characteristics	Rank order among cities ranked	Percentage or numerical
Population size, metro area b	32/305	1,242,594
Percent black b	216/305	2.7
Percent Hispanic b	66/305	2.1
Percent foreign born a	34/100	7.1
Median age (years) a	13/100	31.4
Percent college graduates a	21/100	18.2
Percent women in labor force a	45/100	53.2
Percent married-couple households a	76/100	44.2
Median household income ($) a	57/100	$14,782.00
Average housing value ($) a	30/100	$60,349.00
Percent families in poverty a	30/36	6.1
Percent unemployment a	26/77	10.7

a from Robey (1985), ranking 100 largest cities.
b from U. S. Bureau of the Census (1982), ranking 305 Metropolitan areas.
c from Martin and Avery (1953).

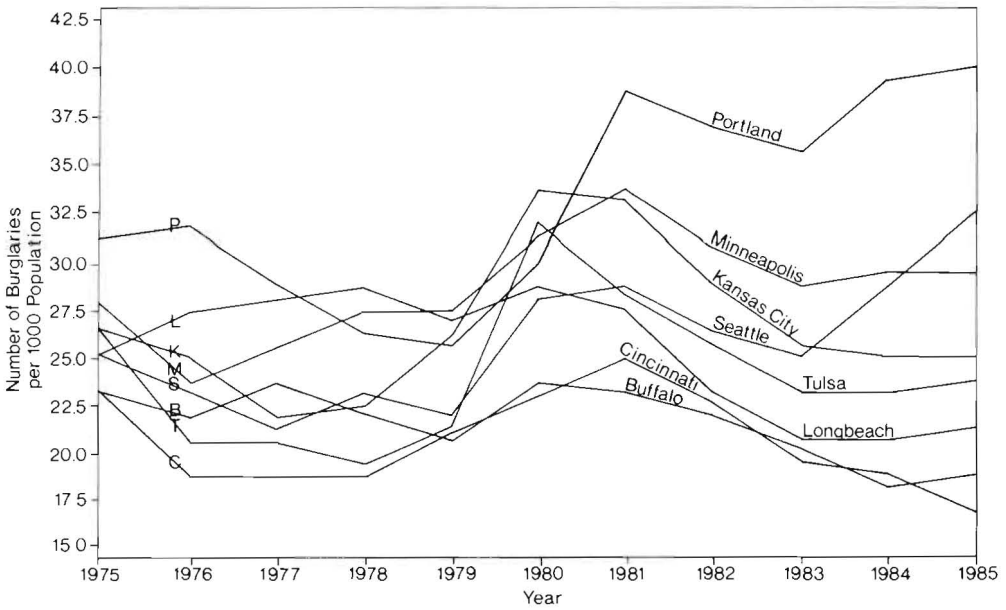


Figure 13.3 Burglary rates between 1975 and 1985 per 1,000 population for eight Project C.U.R.B. (Comparison of Urban Rates of Burglary) cities (McCluhan, 1986).

Crime Reports for 184 cities of over 100,000 population, Portland ranks first in property crime (burglary, larceny, motor vehicle theft, and arson) and ninth in violent crime (criminal homicide, forcible rape, robbery, and aggravated assault). Similarly, according to a recent, comparative study of a small group of cities conducted by Michael McCluhan (1986) of the Portland Police Bureau (Figure 13.3) Portland has had the highest burglary rates since the early 1980's. Even when SMSAs rather than cities are used as the unit of analysis, the Portland metro area emerges as glaringly unsafe. Based on F.B.I. statistics for violent and property crimes, Portland ranks as the 25th most dangerous metro area out of 329 (Boyer and Savageau, 1985).

However, the respondents in our survey did not perceive Portland as an unsafe city. Concern about crime was not a pervasive theme. There were only three responses regarding crime and safety and one was a positive comment stating that women were safe downtown at night. Recently, Bob Hicks (1986) of *The Oregonian* shared this perspective, observing that "Portland, with a higher murder rate than New York, feels safer, more sedate, more manageable."

Although these impressions may not be representative of Portlanders in general, they are in sharp contrast to the facts. Why is the crime rate in Portland so high? Charles Tracy (1986), administration of justice professor at Portland State University, suggests that "Portland's high burglary rate may be partly the result of a public that is more likely to report burglaries than in other cities." In 1980 and 1982, the national average for reporting burglaries was 51 percent, compared to 62 percent for

the same years in Oregon (28 percent of the reported Oregon burglaries were committed in Portland). Burglary rates may also be impacted by participation in neighborhood-based burglary prevention programs such as those begun during the 1972 High Impact Anti-Crime Program. Involved citizens are more likely to report burglaries to the police, resulting in higher rates (Schneider, 1975). In addition, a 1985 *Oregonian* survey conducted by the Columbia Research Center, found that 83 percent of Portland residents viewed the reporting of crime to the police as worthwhile (Hallman, 1985). In contrast, a Bureau of Justice Statistics report indicated that during the 1980's only 35 percent of the nation's victims reported crime to the police (Harlow, 1985).

As a result, we must interpret the crime data with caution. Without comparative data from other cities on the reporting rates of crime victims as well as citizen attitudes towards police, we cannot determine whether Portland is truly an unsafe place to live. We can say, however, that this does not appear to be the perception of the average resident.

Stress

Although Portlanders have a reputation for being "laid back", the results of two recent studies indicate that they experience surprisingly high levels of stress. A 1985 Urban Stress Test of 184 cities (Zero Population Growth, Inc.) found that Portland's overall rating was 3.1 with 3 meaning "warning" and 4 referring to "danger." Eleven criteria were used including population change, crowding, education, violent crime, community and individual economics, births, air and water quality, hazardous wastes, and sewage treatment facilities.

The second study (Straus 1985), compares state rather than city stress levels with similar findings. Comparing data on such stressful events as divorces, abortions, and unemployment, Oregon ranks as the fifth most stressful state – even higher than New York, which was only 16th. Nevada, home of the 24-hour cities of Las Vegas and Reno, was number one. The current and past image of Portland is diametrically opposed to this image of the city as a stressful place to live. Throughout its history, Portland has been portrayed as a relaxed and calm place that "has a way of slowing down newcomers to its own pace" (Neuberger, 1947, p. 108). In 1890, Harvey Scott, editor of the *Oregonian*, noted "the general quiet and tranquility and good order of the place is quite marked" and "the people of Portland are not mercurial or excitable" (cited by O'Donnell and Vaughn, 1976, pp. 32-33).

Based on our survey, Portland's ambience has changed very little since the 1940's. Its residents do not see it as a pressured, stressful city but rather as open, accessible and manageable. Portland is described as "slow-paced," "quiet," "informal," and "pleasant but unexciting."

If the number of psychoanalysts is an indication of stress levels, there are also very few of these in Portland compared with fast-paced, East Coast cities. Based on membership in the American Psychoanalytic Association (1983), Portland has only two psychoanalysts per 100,000 persons compared with 11 in Boston, 28 in Washington, D.C. and 35 in New Haven. Oregonians also have a higher life expectancy than residents of 40 other states (Boyer and Savageau, 1985).

Recreation

As Suzie Boss, associate editor of *Oregon Magazine* (1986, p. 34) observes,

"the 'great outdoors' somehow transforms Oregonians, sets them apart from their fellow humans in Texas or Nebraska, New York or Pittsburgh." With such easy access to Oregon's vast natural playground, it is not surprising that the respondents in our Portland City Club survey praise the city as being recreation-oriented. There are 13 comments referring specifically to outdoor recreation. In addition, many of the 36 geography/location responses highlight Portland's unique proximity to the mountains, coast, and desert (Table 13.1). One respondent noted that "the city's easy access to every environment from seashore to desert, from farm to mountaintop, with all the activities and interests they stimulate can hardly be matched." Other comments include "diversity of recreational opportunities," and "access to outdoors is biggest plus."

With its accessibility to recreation and the outdoors, Portland has earned a reputation for its fitness orientation. In a recent survey conducted by *The Runner,* Portland was designated as one of the best running cities in America, receiving Gold Medal Status along with Atlanta, Boston, Boulder, Eugene, Honolulu, San Diego, and San Francisco. In particular, it was noted that "Portland may have the most lovely runs of any major city" (Flippin, 1984, p. 28). Only Johnson City, Tennessee, ranked higher. Portland, headquarters of Nike shoe company, was also cited for the size of its running community, with 6,500 members in The Oregon Road Runners Club.

Health

With its outdoor and fitness orientation, it is not surprising that Portlanders are very concerned about their health. Based on subscriptions to *Health* and *Prevention* magazines, Portlanders rank 12th highest out of 83 metro areas in their number of "health enthusiasts" (Marlin and Avery, 1983). Compared with other cities, Portlanders also have reasonable access to health care. Portland ranks 38 out of 91 in physicians per 1,000 population and 24 out of 88 in registered and licensed practical nurses in community hospitals (Marlin and Avery, 1983). Although the hospital occupancy rate is low (17th lowest out of 89), hospital costs are relatively high. Comparing the daily community hospital costs of 75 cities, Portland is the 11th highest.

However, what is unique to Portland is its accessibility to alternative health care. According to Martin Milner, N.D. at Portland's Center for Holistic Medicine, "Portland represents a mecca of holistic and alternative health care in the country." Based on personal communication with the American Association of Naturopathic Physicians, only seven states (Oregon, Washington, Arizona, Nevada, Hawaii, Connecticut, and Alaska) currently license naturopathic physicians. Comparing cities within these states, Portland with 80 licensed naturopathic physicians per 100,000 persons, has more than any other city. Seattle with 14.9 is second. Anchorage has 6.25 and Phoenix has 4.3. Portland is also a training center for alternative health care practitioners. A school of naturopathic medicine (one of only two in the country), a chiropractic college, and a college of massage therapy are all located in Portland. As Martin Milner, N.D. suggests, "people come here for training, stay here, and spread the culture."

The Arts

If we rely on the rankings in *Places Rated Almanac,* Portland would certainly

not be considered as a thriving cultural center; it ranks only 55th out of 329 metro centers, in the arts. However, Carl Abbott, professor of Urban Studies at Portland State University and regular contributor to *The Business Journal*, suggests that by emphasizing major art institutions these rankings misrepresent the cultural offerings in Portland. "A look at world-class institutions tells only part of the story for Portland is a genuinely democratic cultural center" (Abbott, 1986, p. 5). There are 30 art galleries, 19 bookstores and 10 museums in downtown Portland alone. Along with New York and Los Angeles, Portland is one of 12 metro areas that has three or more fine arts or public radio stations (Boyer and Savageau, 1985). Based on books loaned per capita, it also has a well-used library system, ranking 18th out of 95 cities (Marlin and Avery, 1983).

Portland's Oregon Symphony scores well by *Places Rated Almanac* standards (Boyer and Savageau, 1985). Opera fans, too, will find that while Portland does not compare with New York or Houston, it ranks eighth out of 45 in the number of months of scheduled performances (Marlin and Avery, 1983). Portland has also earned a reputation for jazz. It hosts the annual Mt. Hood Jazz Festival, and is the home of several nationally-known jazz musicians including Tom Grant, Mel Brown and David Friesen. Several "transplants", such as saxophonist Michael Bard, guitarists Dan Perz and Matt Schiff and drummer Chris Conrad, have also joined the local jazz ensemble. In fact, pianist Tom Grant comments: "Portland probably ranks among the top five cities in the country in terms of the seriousness of the local jazz scene" (Broadhurst, 1986, p. 31). For those who consider rock and roll to be a cultural event, Rick Mitchell, Portland free lance writer, musician and disc jockey, observes that several local bands have developed international or national reputations, and five or six more have the "potential to break nationally".

Portland fares well in its diversity of cultural activities and in its level of participation in the arts but lacks "five-star attractions that make the national guidebooks" (Abbott, 1986, p. 5). However, according to Dan Monroe, President of the Oregon Art Institute, the current variety and involvement in the arts are insufficient for Portland's economic development and growth (Monroe, 1986). Portland has such major institutions as the Oregon Museum of Science and Industry, the zoo, the Oregon Art Institute and the Oregon Symphony. But state-level support of the arts has been dismally low. Based on legislative appropriations for 1985-86, Oregon ranks 55th of 56 among the states, the District of Columbia and five territories.

Political Climate

Although our City Club respondents did not always agree in characterizing the politics of Portland, some common themes did appear. Politics were described as "politically clean and open compared to the East"; as open, "civic involvement is encouraged and real"; and as concerned about the quality of life and of the environment in the city. The place of the citizenry on the conservative-liberal dimension was variously described as "progressive", "mildly progressive", "on the conservative side" and as "a unique blend of conservatism and liberalism that has resulted in government reforms". Gordon Dodds, history professor at Portland State University, describes Oregon's

progressive roots as springing from conservative soil. "Paradoxically, even the innovations were designed to preserve the best of the past" (Dodds, 1986, p. 317). What has been progressive is the methods. The objective has been conservative.

Questionnaires were sent to several Portland journalists, asking them to comment on the political scene. David Broder, columnist for the Washington Post described the political climate as: "open, unpredictable, participatory. Portland is a big city but its politics seem small-town. Everyone seems to know everyone else, at least the political activists do, and there is a good deal of camaraderie and tolerance . . . Change is frequent, if not constant, in Portland, reflecting the openness of its politics."

Neal Peirce, syndicated columnist, says: "open, spirited, and -- of course -- open to the unconventional. Portland politics do appear more issue-oriented than those of many cities. Hard to imagine a Neil Goldschmidt or a Bud Clark rising to the mayoralty of many cities -- the 'establishments' would have blocked them".

The unpredictability may be a function of the openness of the political scene to the citizen activist and the relative weakness of the political parties. One indicator of citizen involvement is the use of initiatives on the ballot. Ferguson (1985) has reviewed the use of the initiative by states since 1900. Citizens are allowed to use the initiative process to put measures on the ballot in only 23 states, all but six of which are west of the Mississippi. The practice evolved during the Progressive era when political institutions in the west were not firmly rooted. Between 1900 and 1982, Oregon had by far the highest number of total initiatives in the country. Oregon also had the most initiatives directed toward environmental issues in all time periods except 1970-1982, when California and Washington had nine to Oregon's six.

Neighborhoods

Another indicator of citizen participation in Portland is involvement in the political scene at the neighborhood level. Neighborhood associations first developed in the city in 1969 and became formally associated with city government with the establishment of the Office of Neighborhood Associations in 1974. Some funding is provided by the city for newsletters for the approximately 70 neighborhoods and for staff in five regional offices. Neighborhoods are routinely involved in such city issues as budgeting for capital improvements, and planning decisions in the neighborhood. A recent book on neighborhood organizations noted that: "Portland's government has made an unusually large commitment to neighborhood organization. Probably nowhere else has collaboration been so dominant between neighborhoods and local government. In a decade of budget retrenchment by local governments almost everywhere, Portland's Office of Neighborhood Associations keeps growing, with a budget to match the growth" (Cunningham and Kotler, 1983, p. 66).

Perhaps city size is one source of the active citizen participation in Portland. Environmental psychologists have developed the concept of "overmanning" to describe the impact of the size of a setting--whether a school, a church, or a city -- on the behavior that occurs within it (Wicker, 1979). In their study of school size, Barker and Gump (1964) found that the number of "behavior settings" in which students could par-

ticipate increased much more slowly than the size of the school. Thus, a high school with 2,000 students and one with 50 students were likely to have just one football team and one junior class play. Students in the large school on the average participated in fewer activities, played a less central role in those they participated in, and were more likely to be entirely uninvolved. If we draw an analogy to city size, it seems likely that the opportunities to be involved in city life and to play a central role become fewer and fewer as the size of the city increases. When Mayor Lindsey developed an emphasis on neighborhood government in New York City, for example, the neighborhoods encompassed several hundred thousand residents, rather than several thousand as in Portland. Although classified as a city, many people commented on its "big small town" character. The size of the city and the open political climate combine to make the residents feel that they can make a difference.

SUMMARY

Based on our indicators it appears that national experts as well as Portanders rate Portland as among the top 25 percent in livability, although they may disagree somewhat on where it ranks within that top quartile. Many of the things that make it livable were here long before the city was settled: its geographic location, scenic beauty and climate. In recent years some aspects of the social and economic climate have been less positive, particularly the crime rate and economic stagnation. But on the whole the citizenry have created a unique and livable city. Among its prominent features are its urban form--one respondent described it as "an architectural jewel on the banks of the Willamette" -- and its active, open political scene that has become known in part for its emphasis on preserving the area's natural gifts.

Perhaps no one has better stated the themes that we saw repeated in historical and contemporary descriptions of the city than one of our City Club respondents, who said: "Terence, who advocated moderation in all things, probably would have liked Portland. Its size is medium, its climate is equable, the pace of living is relaxed. Manners are informal. Its politics are honest and mildly progressive. Strong passions rarely sweep the voters. The population is relatively homogeneous. Extremists of the right or left are few. Wealth is present but seldom conspicuous. High culture in the arts may be hard to find. The public is educated and intelligent. To some, Portland's aspect is bland and smug; to others, restful and comparatively contented . . . The relative lack of cultural diversity is a mild drawback, but as one who enjoys moderation in human affairs and high excitement in the out-of-doors I can't think of a better place to live."

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