

CITY OF TUALATIN  
TUALATIN DEVELOPMENT CODE

INDUSTRIAL PLANNING AREA  
PLAN AMENDMENT

PA 83-1

PUBLIC HEARING DRAFT

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TUALATIN COMMUNITY DEVELOPMENT CODE  
WESTERN INDUSTRIAL LANDS AMENDMENT

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TUALATIN COMMUNITY PLAN

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# CITY OF TUALATIN - INDUSTRIAL PLANNING AREA - PLAN AMENDMENT

## PART 1 - INTRODUCTION TO THE PLAN AMENDMENT

This amendment of the Tualatin Development Code, the acknowledged comprehensive plan for the City, was prepared by the City of Tualatin Planning Department. It is based on the drafts of the Sherwood/Tualatin Community Plan prepared by the Washington County Planning Department.

This plan is designed to provide the basis for the future growth and development of the Tualatin Western Industrial District, in particular, that portion of the industrial area annexed to the City in October of 1982. The annexation area will be hereafter referred to as the "Industrial Planning Area", while the entire industrial area will be referred to as the "Western Industrial District." This amendment is part of the Tualatin Development Code, therefore, the policies and standards of this document are the land use regulations that will be enforced within the planning area.

This planning document is written as an amendment to the Tualatin Development Code. As such, it is organized into a format identical to the Code. The text of the amendment is a revision of the Code, therefore, the material in this amendment will replace material within the same section of the existing code upon adoption. The table of contents of this amendment lists the areas covered and the section numbers and pages.

This document is a companion to the one entitled "Tualatin Development Code - Residential Lands Amendment." These two documents contain the City's plan for all lands within Washington County that were transferred to the City for planning authority and was originally part of the "Sherwood/Tualatin Community Plan." It also is being developed concurrently with the 1983 update of the "Transportation Element of the Tualatin Public Facilities Plan." Each of these three documents is based on the assumptions, findings, and recommendations of the others.

## PART 2 - PURPOSE OF THE PLAN AMENDMENT

The general purpose of this plan amendment is to guide the physical development of the study area, as part of the City, so as to preserve the special features of the area while accommodating and encouraging economic growth. Specifically, the plan amendment is intended to define locations for both private and public lands and public facilities and to arrange these uses in a manner that reduces conflicts and provides convenient movement and compatible relationships between individual land uses.

The development approach planned for the Western Industrial District is related directly to "filling in" the scattered

## CITY OF TUALATIN - INDUSTRIAL PLANNING AREA - PLAN AMENDMENT

industrial development pattern between the existing developed area of the City and the fringes of the Sherwood area. Development planned for this area is intended to be a supportive extension of existing and previously planned development. This approach, which is used in both the industrial and residential plan amendments, is intended to complete the definition of Tualatin as a distinct, self-sufficient community with a healthy balance of land uses.

The City of Tualatin has determined that it is becoming a major employment center and that continued industrial development in the study area will serve to strengthen this position. The City desires to foster and stimulate economic development within its boundaries, while preserving the significant natural features and the integrity of its residential neighborhoods. This plan is intended to find that critical balance point where all of these objectives can be met.

When adopted by the City Council and thereby integrated into the Tualatin Development Code, this amendment will be the official land use guide for the lands involved. There shall be, at no time after the adoption of this plan, the construction of any building, structure or use, used or occupied contrary to the provisions of this plan.

### PART 3 - THE STUDY AREA

The study area is generally bordered on the north by Tualatin Road, on the east by the earlier City Limits which are generally delineated by the current developed area, on the south by the METRO UGB and the Burlington Northern Railroad tracks, and on the west by Cipole road and the border of the Sherwood planning area.

### PART 4 - CITIZEN INVOLVEMENT

Tualatin Planning Advisory Committee (TPAC)  
1,000 Friends of Oregon

### PART 5 - AGENCY AND GOVERNMENT COORDINATION

City of Sherwood  
City of Wilsonville  
City of Tigard  
City of Rivergrove  
City of Lake Oswego  
Unified Sewerage Agency  
Tualatin Rural Fire Protection District  
Tigard School District 23J  
Sherwood School District 88J

## CITY OF TUALATIN - INDUSTRIAL PLANNING AREA - PLAN AMENDMENT

Washington County

Clackamas County

Metropolitan Service District (METRO)

Tri-Met

Portland Metropolitan Area Local Government Boundary Commission

State of Oregon Land Conservation and Development Commission

State of Oregon Department of Fish and Wildlife

State of Oregon Department of Transportation

State of Oregon Department of Environmental Quality

State of Oregon Department of Economic Development

US Army Corp of Engineers

US Environmental Protection Agency

General Telephone Company of the Northwest, Inc.

Northwest Natural Gas Company

Portland General Electric Company

## INTRODUCTION

2.010 Background.

(1) The City of Tualatin's first Comprehensive Land Use Plan was adopted in 1972, 59 years after the City was incorporated in 1913. In 1975, the City adopted a plan for the City's Urban Renewal Area, and then produced a more detailed Renewal Plan in 1977. Since the adoption of the 1972 Plan, the City has seen rapidly changing circumstances that have created the need for a revised plan. These circumstances included the establishment of the State Land Conservation and Development Commission (LCDC), adoption of the Statewide Planning Goals, annexation of most of the industrial area west of the City in 1982, and accelerated economic development that has occurred since 1972 in the Tualatin area.

(2) In 1973, the Oregon Legislature passed a law establishing the Land Conservation and Development Commission (LCDC) and empowered the Commission to adopt Statewide Planning Goals. The Legislature also required all Oregon cities and counties to adopt plans and ordinances in conformance with the statewide goals and to coordinate their plans with each affected local general purpose government or special district. Each city or county also had to prepare a plan that considered state and federal government programs. To help each local government prepare a plan to meet the planning goals, the State Legislature allocated considerable sums of money to provide planning grants to the local

jurisdictions. This planning effort has been achieved by using some of those grant funds.

- (3) While the Statewide Planning Goals were being formulated, the nation was recovering from an economic recession. Tualatin was only beginning to feel the double impact of renewed economic growth. At the same time, development of the metropolitan urban fringe finally met and passed Tualatin's border. Because of these factors, the City is now embracing an unprecedented development boom that must be guided by an adequate plan that will ensure the long-term livability of the City. While the 1972 Plan was adequate for its time, a new plan - building on the strengths of the old plan - was necessary to provide an adequate guide for current and future City growth.
- (4) After six years of work, Tualatin adopted a revised comprehensive plan on October 22, 1979, which, with amendments, was acknowledged as being in compliance with the Statewide Goals and Guidelines by the LCDC on September 24, 1981.
- (5) The Tualatin plan is unique in that it involves a single document integrating both the traditional comprehensive plan and zoning ordinance into a single development code. This direction is followed in the land use mapping by having only one map with planning districts rather than a zone map and a plan map. With this approach, Tualatin has given a very

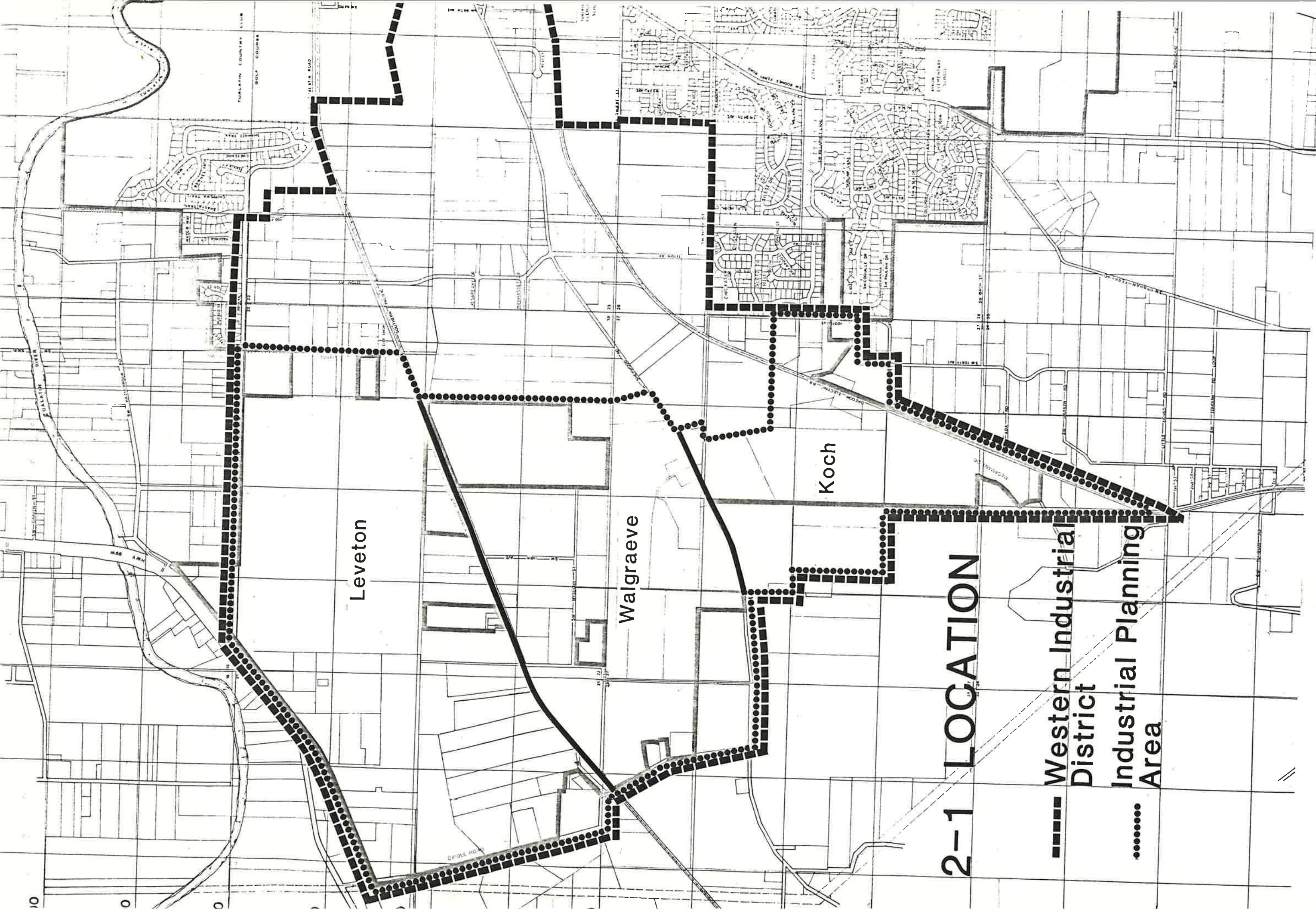
strong legal authority to its planning programs.

(6) The 1979 Tualatin Plan dealt with land both within the City Limits and in the unincorporated area out to the Metropolitan Service District (METRO) Urban Growth Boundary (UGB). However, the acknowledgement of the plan by the LCDC was only for the City limits. Therefore, the 1979 plan was termed "complimentary" in that it dealt only with land inside the limits and left the growth areas reaching to the UGB to Washington County for detailed planning and administration. It was the County's responsibility to finalize the plan for this area so that it could be acknowledged by the LCDC.

(7) Planning responsibility shifted to the City with the October 1982 annexation of most of the industrial planning area. At that time, Tualatin and Washington County agreed that the City would assume planning responsibility for the unincorporated balance of the planning area. In order to fulfill this responsibility, the City prepared two separate land use plan amendments, one for the newly-annexed industrial area and another for the unincorporated, predominantly residential balance of the planning area. At the same time, the City prepared updates of the Transportation and Sewer and Water elements of the Public Facilities Plan. These three amendments, scheduled for adoption in 1983, were intended to bring the total plan into

"active" status. This means that the City has taken authority for its own growth lands and is planning for those lands so that they can be best integrated into one community.

- (8) Map 2-1 shows the Western Industrial District, the Industrial Planning Area, and the individual industrial areas.



Leveton

Walgraave

Koch

## 2-1 LOCATION

Western Industrial District

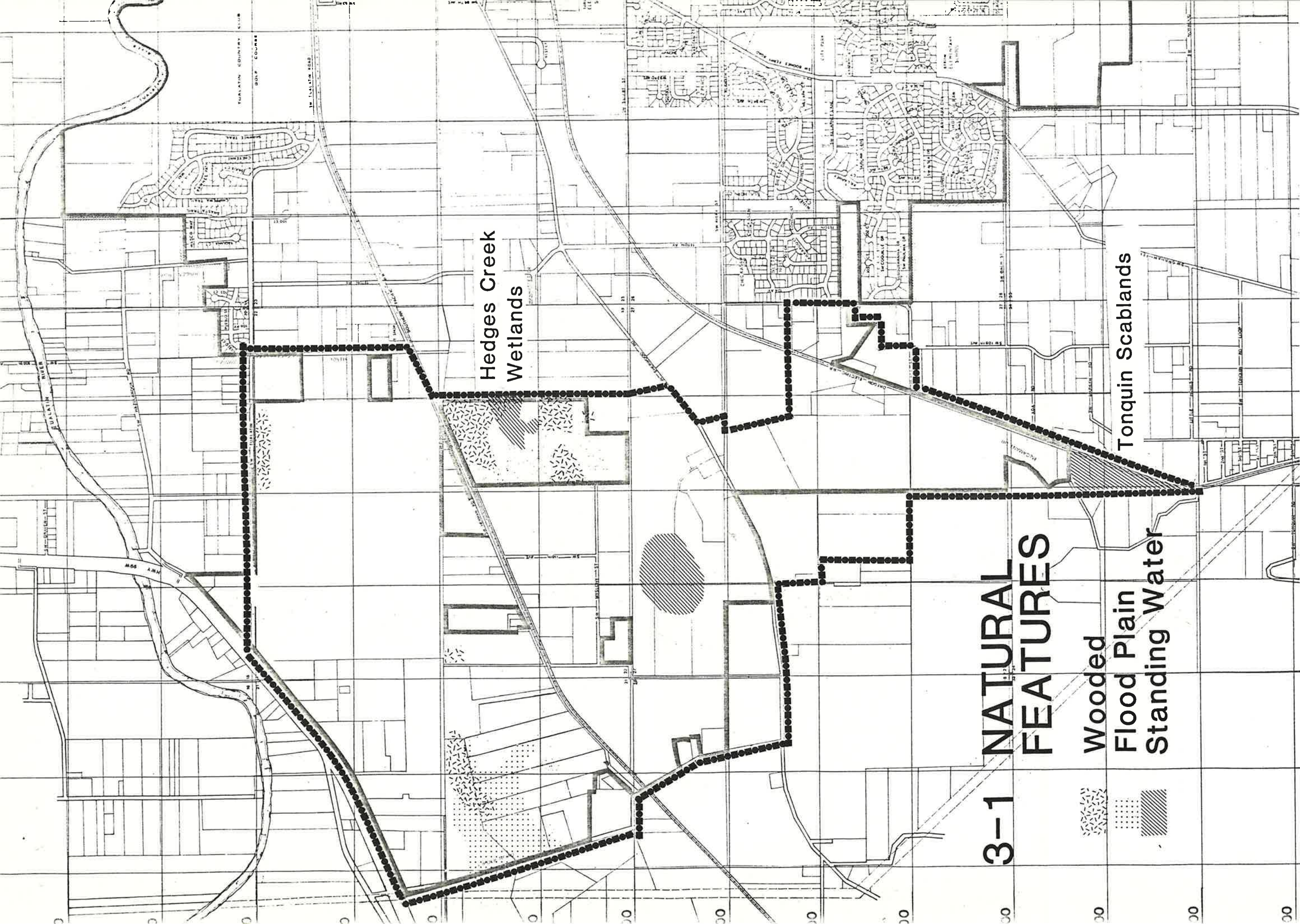
Industrial Planning Area

Map 2-1 goes here

3.035     Natural Resources and Features in the Industrial Planning Area.     The natural environment provides both opportunities and limitations for future growth and development. Certain lands lend themselves well to development while others should be protected as a natural or cultural resource or in order to prevent danger to life or property. In this section of the plan amendment, the natural resources of the industrial lands area will be discussed especially in terms of limitations they may put on future development. Map 3-1 shows these major areas.

(1)     Geology

- (a)     The planning area is a part of the lower Tualatin Valley syncline (shallow down-warp). Columbia River basalt is the predominant geological feature underlying the area.
- (b)     The basalt formation occurs at the surface in several locations, but can generally be found at a depth of 560 feet with the thickness of 1,000 feet. Overlying the basalt are all alluvial (river) and lacustrine (lake) deposits of silts, clays and sands.
- (c)     A major fault line traverses the planning area from the southwest to the northeast.
- (d)     There are no known limitations on building in the industrial planning area due to geologic conditions.



Hedges Creek  
Wetlands

Tonquin Scablands

### 3-1 NATURAL FEATURES

Wooded

Flood Plain

Standing Water



Map 3-1 goes here

(2) Soils

(a) Information regarding the soils of the area can aid in identifying safe buildable lands and/or hazardous conditions. Soils in the area are predominantly of the Woodburn-Aloha-Willamette association. This group is composed of moderately well drained silt loam over silty clay loam soils.

(b) The only property in the planning area that appears to have special building considerations due to soils is Tax Lot 500 on Tax Map 21S 22D, known as the Walgreave property. This parcel is an unincorporated enclave, or "island". The Hedges Creek Wetlands extend into this area presenting soils in the central portion that are poorly drained and have poor strength characteristics. Pursuant to the City's Wetland Protection District ordinances, appropriate steps will be taken to assure protection of significant wetlands in the area. If building does occur, special foundation designs may be necessary to accomodate the soil limitations.

(3) Slope, or the measure of topographic relief is another characteristic of land which may constrain development or increase the erosion potential. There are very few areas in the industrial planning area with slopes any greater than 10%, which lends itself very well to excellent suitability

for industrial development.

- (4) Flood Plain. There is a small portion of the planning area that is part of a 100 year floodplain, located immediately east of Cipole Road. Development in this area will be regulated by the City's Floodplain Ordinance. Standing water may occur in other areas as a result of heavy rainfall during the winter, but no actual flooding occurs other than an increase in water level within the Wetlands and in a ponding area located north of Tualatin-Sherwood Road near the Drake property. This presents no limitation on development, as long as this storm drainage is accomodated in the building and site designs, as required by City Code.

(5) Vegetation

- (a) Native vegetation adds natural beauty and character to an urban community. Vegetation also serves an important function in reducing erosion and excessive water runoff, stabilizing slopes, and providing open space and wildlife habitat. The introduction of other vegetation as part of the development process enhances the beauty of the area, while "softening" the visual nature of industrial development.

- (b) The industrial area is generally covered with native grasses, intermingled by areas of heavier, brushy

vegetation. There are several significant stands of tree within the area, shown on Map 3-1. These trees shall be preserved and maintained as part of any industrial development where ever practical.

(6) Fish and Wildlife

(a) While there is a substantial fish population in the Tualatin River, there is no known significant population in the few creeks of the industrial area.

(b) The Technical Memoranda of the Community Plan describes the wildlife resources of the industrial area in its discussion of "Grasslands/Farmlands." This is quoted below:

"Open meadow areas and pasture lands support ring-neck pheasant and California quail. These species have suffered drastic population declines recently, according to the Department of Fish and Wildlife, possibly due to loss of habitat, changing farm practices, wet spring weather, and possibly increased predation. Possum and red fox that are common in these areas may have had a detrimental effect on upland game bird populations. Raptor species that feed in the open meadow areas are red-tailed hawk, rough-legged hawk, American castril, and marsh hawks. Band-tailed pigeons are found in wooded areas adjacent to open farmlands.

Morning dove occur in areas of farmland along with common crow, cedar wax wing, starlings, red-winged blackbirds, cow birds, and meadowlark. Pocket gopher, California ground squirrel, gray fox, and red fox are commonly found in open areas."

- (7) Agriculture. While almost all of the industrial planning area is comprised of Class II through IV soils, it has been accepted as necessary and appropriate for future urbanization and included in the METRO Urban Growth Boundary. Probably, agricultural uses will continue on many of these properties until they are converted to industrial uses.

(8) Water Quality

- (a) Heavy urbanization of the study area could cause water quality problems on the Tualatin River and its tributaries within the study area, primarily Hedges Creek and its wetlands. Uncontrolled storm runoff from land with a high percentage of impervious surface (such as roofs and parking lots) can concentrate greatly increased flows with increased sedimentation and pollutants during periods of high runoff. Neither the river nor the creek area can handle these runoffs and their pollution.

- (b) It will be very important to have adequate storm drainage facilities in place prior to or as part of development. All such facilities must conform to the City's storm water management program which is designed to protect the existing river and creek areas from excessive flows.

(9) Air Quality

- (a) The Oregon Department of Environmental Quality (DEQ) and METRO are responsible for the development of strategies to bring air quality in the Portland Air Quality Maintenance Area (AQMA) into compliance with federal and state standards. DEQ is primarily responsible for the control of pollutants coming from stationary sources (e.g. industries), while METRO is responsible for the control of pollutants produced by mobile sources (e.g. motor vehicles).
- (b) The quality of the air in the Tualatin area is difficult to quantify due to the absence of any monitoring station nearby. The two locations that measure air pollution in Washington County (Beaverton and Hillsboro) do not provide an accurate measure of pollutants in the planning area.

- (c) The Tualatin Community Plan indicates that air quality in the planning area is within allowable limits. The greatest single problem area, at the time the Plan was developed, was in the immediate vicinity of Nyberg Street where carbon monoxide standards were exceeded. The recent completion of the Tualatin-Sherwood Road "Bypass" takes much of the traffic off Nyberg Street and onto a system with inherently less congestion at current traffic volumes.
- (d) However, with development of the Industrial Planning Area, traffic will increase significantly on both Tualatin-Sherwood Road and Nyberg Street as they funnel into the I-5 interchange that most directly serves the area. The transportation element of this plan amendment will discuss the desirability of additional interchanges with I-5, however, it is important to note that alternative access routes, such as the proposed Norwood Interchange and Expressway, may be necessary if unacceptable levels of pollution in the downtown area are to be avoided in the future.
- (e) No significant air pollution problems exist with industries in the industrial area, as most are totally non-polluting in nature. The City has continued this direction in the preparation of its Development Code by prohibiting particularly "heavy" industries, including

those with great potential of polluting, from locating in any planning district. The use of these districts on the lands in the industrial planning area will go far in assuring that air pollution from these point sources will be negligible.

- (f) Much greater detail on air pollution in Tualatin including the planning area may be found in the Technical Memoranda of the Community Plan. Specifically, the report by Seton, Johnson & Odell, Inc., Consulting Engineers, includes an assessment of current conditions, projections of future conditions, and recommendations for standards.

(10) Noise

- (a) Noise is defined as unwanted sound and is measured in terms of decibels (dB). As demonstrated in numerous medical studies exposure to noisy situations can result in pronounced physical and/or emotional problems (e.g. stress, increased blood pressure, and deafness).
- (b) Certain types of land uses, residences, hospitals, libraries, offices, and of particular importance in this planning effort, high technology industries, are "noise sensitive." This means that the operation of these uses conflict with the existence or introduction of another use which creates noise above certain

levels. For example, in residential areas, federal government standards recommend that daytime noise levels not exceed 50 dB. Land use regulation can be used to help separate noise sensitive uses from noise sources.

(c) Traffic on major transportation routes and the operations of the sand quarries are the major sources of noise that impact the study area.

(d) The State of Oregon Department of Environmental Quality (DEQ) and Environmental Quality Commission (EQC) are authorized to adopt and enforce statewide standards for noise control. State law permits local jurisdictions to adopt and enforce noise reduction programs. Tualatin has industrial noise standards. However, the City's Environmental Standards Task Force is presently developing a comprehensive noise ordinance. The results of its work, as adopted by the Council, will provide the legal foundation for noise regulation in the industrial area.

(11) Hedges Creek Wetlands

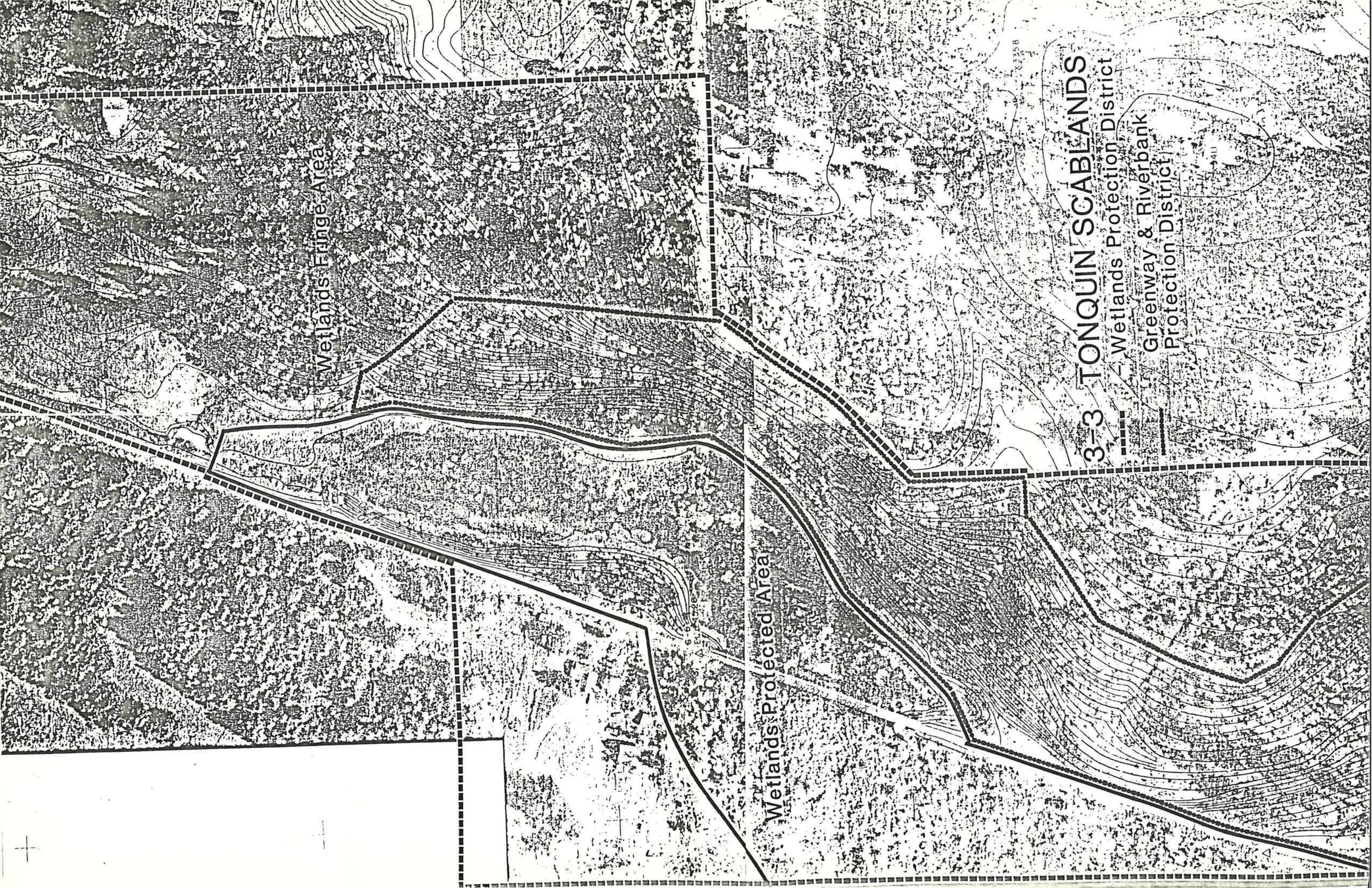
(a) The Hedges Creek Wetlands constitute the one of the two most significant natural areas in the industrial planning area. Most of the wetlands fall east of the

industrial planing area with a small portion in these industrial lands. The wetlands provide a fish and wildlife habitat area and are considered one of the most important in Washington County since they comprise the largest continuous wetland in the county.

(b) With the adoption of the Development Code, the City established a Wetlands Protection District (WPD). This district has two subdistricts, the Wetlands Protected Area (WPA) which includes all of the actual marsh, and the Wetlands Fringe Area (WFA) which is the land that includes the immediate watershed to the WPA.

(c) Within the WPA, only very limited development, involving utility structures and some fill, is allowed. No permanent structures or urban type uses are allowed. In the WFA, the uses of the underlying planning district apply, but certain development restrictions must be followed. This includes a 40 foot setback from the WPA.

(d) The wetlands extend a short distance into the Industrial Planning Area. They have been mapped and are shown on Map 3-2. This area will be subject to the provisions of the Wetland Protection District as are similar areas immediately to the east of the former city limits.



Wetlands Protected Area

Wetlands Fringe Area

### 3-3 TONQUIN SCABLANDS

- Wetlands Protected Area
- Wetlands Fringe Area
- Greenway & Riverbank Protection District

map 3-3 goes here      Tonquin

panhandle and scoured enormous channels, coulees and scablands across much of eastern Washington. The constriction of the Wallulla Gap just north of the Oregon border near the Tri-Cities formed a lake 1,250 feet deep. A similar backup east of the Cascades at the The Dalles caused the water to rise up 1,000 feet. Within the Columbia Gorge, the flooding was over 700 feet, almost to the top of Crown Point. The rush of floodwaters through the Lake Oswego gap dropped huge amounts of boulders and other large debris in the Durham area. Some of these deposits have been quarried. Finer sands, deposited along both sides of the Tualatin River to the west and southwest of Durham are now being mined.

- (c) The high velocity floods surged from the Tualatin Valley into the central Willamette Valley across the low lying hills between Sherwood, Tualatin and Wilsonville. The effects of scouring the bedrock are noticeable up to at least 300 feet above sea level. The high water mark of the floods was over 400 feet, with the entire Willamette Valley lowland a temporary lake. Icebergs carrying rocks from the Canadian Rockies left their deposits ("glacial erratics") scattered all over the valley, including Washington County. One very large erratic can be seen near Highway 18 between Sheridan and McMinnville in Yamhill County.

(d) There are two related elements of the Scablands that are found in the Tualatin planning area. The Scablands area is a depression surrounded by steep cliffs, most predominantly on the eastern side. Part of the cliffs are vegetated with relatively drought-tolerant plants because of the the shallow soil. The dominance of Pacific madrone (*Arbutus menziesii*) is especially striking for a locale in the northern Willamette Valley. The cliffs pose significant building restrictions and should be protected due to their slide and erosion potential as well as their geologic and scenic interest.

(e) The second portion is the wetlands area. A shallow lake lies generally east of and parallel to the Burlington Northern Railroad tracks. This lake goes under the tracks and becomes a large swamp on the west side. This area is quite isolated however the lands east of the tracks are designated in the Low Density Residential (RL) Planning District and those on the west side in the Light Manufacturing (ML) Planning District. These two areas may be the premier sites in the Scablands most deserving of preservation. The Nature Conservancy may wish to become actively involved in keeping this area in its present condition.

- (f) In order to protect these valuable nature resource lands, two special districts are used. The entire Scablands area is designated GRP (Greenway and Riverbank Protection) District. This provides for the preservation of lands that are not actual wetlands, but that have unique geologic elements, in particular the cliffs to the east of the lake area. No development will be allowed on the cliffs, however, the residential density that would be allowed on the entire acreage for each property can be transferred to the developable portions of the parcel.
- (g) The entire area is also designated WPD (Wetlands Protection District). The lake and swamp themselves are designated in the Wetland Protection Area (WPA) while other low lying lands are in the Wetlands Fringe Area (WFA). The WPD is described in (12)(c) above.
- (h) The area is mapped by legal tax lot (T.L.) rather than descriptions of the actual physical features. The tax lots involved include: tax maps 2S1 27D, T.L. 300 and 301, and tax map 2S1 34A, T.L. 1500, 1501, 1502, 1503, 1600, 2000, 2001, 2002, and part of lot 8 of North Tonquin Subdivision.

(13) Mineral/Aggregate Resources

- (a) Relative to some other counties in Oregon, Washington County, including the Industrial Planning Area, is not particularly rich in mineral and aggregate resources.
- (b) Five rock quarries are active between Sherwood and Tualatin, primarily in the Tonquin area south of the industrial planning area. These quarries supply material needed for the construction industry.
- (c) There are three active sand mines in the industrial planning area. These are located along the east side of Highway 99W.
- (d) Quarrying operations can conflict with nearby residential and sensitive commercial and industrial uses. Noise, truck traffic and dust associated with quarry operations are the major sources of conflict, along with the visual aspects of a quarry.
- (e) These sand quarries are across the highway from a proposed higher density residential area and only a short distance from the proposed campus industrial area along Tualatin Road. Negative environmental impacts from the quarries can degrade the desirability of the lands for both uses.

- (f) It is important that the industrial performance standards within the Development Code be enforced in order to minimize any adverse impact.

(14) LCDC Goal 5 Analysis

- (a) OAR 660-16-000 deals with the implementation of Statewide Planning Goal 5 - Open Spaces, Scenic and Historic Areas, and Natural Resources. There are five major steps that must be followed in meeting the goal. This section will deal with these five steps, summarizing the findings, conclusions, and actions of the total Plan.

- (b) Resource Inventory. The first 13 sections of this Plan element inventoried the resources found within the industrial planning area. Of the required items for inventory, the following are found in the study area:

1. Land needed or desirable for open space. This includes the wooded lands, the Hedges Creek Wetlands, and the Tonquin Scablands.
2. Mineral and aggregate resources. This includes the sand quarries immediately south of the Pacific Highway.

3. Fish and wildlife areas and habitats. The Hedges Creek Wetlands and the Tonquin Scablands provide these habitats.
4. Ecologically and scientifically significant natural areas. Again, the Wetlands and Scablands are part of this inventory.
5. Water areas, wetlands, watersheds and groundwater resources. Hedges Creek Wetlands and Tonquin Scablands fall in this category.

(c) Significant, Outstanding or Needed Decision.

1. Three portions of the Industrial Planning Area are determined to be significant, outstanding and needed. These include the major wooded areas noted on the Natural Features Map, the Hedges Creek Wetlands, and the Tonquin Scablands. The special character of each of these natural elements that sets them apart is discussed in the previous sections of this plan element. It is the determination of the City through this process that these three natural features are of great value to the community and the region and should be preserved.
2. The sand quarries have been determined to not be

significant, outstanding or needed. There are alternative sites in the County for producing sand, including outside of the METRO Urban Growth Boundary. The sand operation presents a potential negative factor in attracting other industrial uses to the area due to noise, dust, and heavy truck traffic. It appears that the quarry operations will continue until land values and demand are such that another more suitable type of industrial use will locate on the properties involved.

(d) Conflict Analysis. For each of the three identified natural feature areas worthy of protection, there is the potential of conflict from industrial uses. The properties involved are part of the Western Industrial District and are designated with industrial planning districts. Potential conflicts include:

1. Loss of the resource through conversion of the area to industrial use. This would involved cutting of the wooded areas and draining and filling in the Wetlands and Scablands.
2. Creation of adjacent activities that would degrade the resource areas. In particular, this involves the potential of industrial uses adjacent or near

the water areas that would disrupt wildlife or pollute the water.

- (e) Economic, Social, Environmental, and Energy Consequence Analysis. Where there is a conflicting use, an analysis of the consequences on each of the above factors must be made.

1. The economic impact of protecting the resource is directly related to the loss of potentially productive industrial ground. However, for the Hedges Creek Wetland, the loss is small in comparison to the acreage available. The Wetland covers only 10 to 25 percent of the 65 acre parcel within which this portion lies. This area can easily be incorporated into the landscape and open space plan of any industrial development. The portion of the Tonquin Scablands within the industrial area occupies virtually all of the parcel it is in. However, it would be almost impossible to utilize this area for industrial purposes as the cost of draining and filling the swamp and lake would be considerable. There should be no adverse economic impact from the swamp's preservation. The wooded areas are predominant on several properties, and will have an impact on the character and intensity of use allowed. However, these trees can be incorporated

into required landscaping without much loss of net buildable area. The exception is the parcel at the far southern portion of the study area, where the preservation of the trees is necessary to preserve the structural integrity of a steep slope.

2. The two wetland areas have had a significant social impact. They are subject to much educational study by many schools in the surrounding area due to their unique nature, significance, and proximity. The point of proximity is important as there are few areas within the metropolitan region that have such natural feature so readily accessible. The wooded areas will be of special significance when the District becomes heavily developed with new industries. These woods will be important "breaks" in what could otherwise be an fairly harsh industrial landscape. If preserved, the woods will be important to the many industrial employees expected in the area. The loss of these areas would be of considerable social harm due to their unique nature, open space value, and environmental significance.
3. Environmental impacts would be great if the

natural areas were not preserved. The trees provide an important visual "break" in this industrial area as well as a wildlife habitat. The two water areas are of outstanding ecological and educational value. Their destruction would cause irreparable impact on the environment.

4. There are no known energy consequences of either using or not using the resource areas.

(f) Program Decision. There are several actions that will be taken to preserve these resources.

1. The significant wooded areas are identified and mapped. The policy of this Plan is that these trees will be preserved to the greatest extent possible while still allowing the economic use of the properties. The trees can be left in their natural state or can be incorporated into the design of the development's more formal landscaping, setbacks, parking lots, or building clusters.

2. The Hedges Creek Wetlands and the Tonquin Scablands are both placed in the Wetland Protection District (WPD). The actual wetlands areas are within the Wetlands Protected Area (WPA) which allows almost no development activity. The

balance of the lots are in the Wetlands Fringe Area (WFA) which sets special setback and use standards to protect the water resource.

3. The provisions of these policies and ordinances will be met administratively by the City staff and through the provisions of Section 50 of this Code, the Community Design Standards, and in particular through the Architectural Review process.

3.065      Industrial Land Use.

- (1) It is very important to inventory and analyze existing land use in a given planning area to help determine an appropriate land use pattern for the future. Since the first plans affecting the Industrial Planning Area were developed in the early 1960's, it has been recognized that the traditional land use pattern of the study area, which involves agricultural uses with a slow but steady transition to industrial uses, is the most appropriate and desirable.
- (2) The City of Tualatin has reaffirmed this general land use pattern with the 1979 adoption of the Tualatin Community Plan, and its subsequent LCDC acknowledgement, and the adoption of this plan amendment. However, the City has, through the action of annexing most of the study area, committed itself to providing the public facilities and services that will be necessary to encourage an aggressive development pattern for the area. The City is prepared to provide a means to these services in order to develop one of the largest and best industrial districts in the Portland metro area.
- (4) This element of the plan amendment will inventory the land uses, and provide an analysis of the vacant, buildable lands that are ready for industrial development.

- (5) Land Use Inventory. A land use-buildable land inventory for the Tualatin-Sherwood planning area was conducted initially in 1977 as part of the development of both the City and County comprehensive plans. This inventory was updated in two different ways in late 1982.
- (6) First, the Port of Portland developed a significant planning document entitled Industrial Development Factbook. This document inventories all industrial land within the western portion of the City including the Industrial Planning Area. It includes detailed mapping and aerial photos of all industrial lands indicating size and vacancy. It also has a listing of existing industrial uses. The City, Chamber of Commerce, and the development community will be using this document as a major tool in bringing major new industries to the area. The Industrial Development Factbook is incorporated by reference as an element of this plan amendment.
- (7) Second, the Tualatin Planning Department inventoried all land within the Industrial Planning Area, as well as all other lands on the westside that are part of the total study area. This inventory was done on a property by property basis and includes details on vacant parcels, planning districts, and non-buildable and buildable land. It is compiled by planning districts and tax map groupings. The compiled inventory information can be found in Table 3-4, below and seen on Map 3-4. This table shows that much of

## INDUSTRIAL LANDS

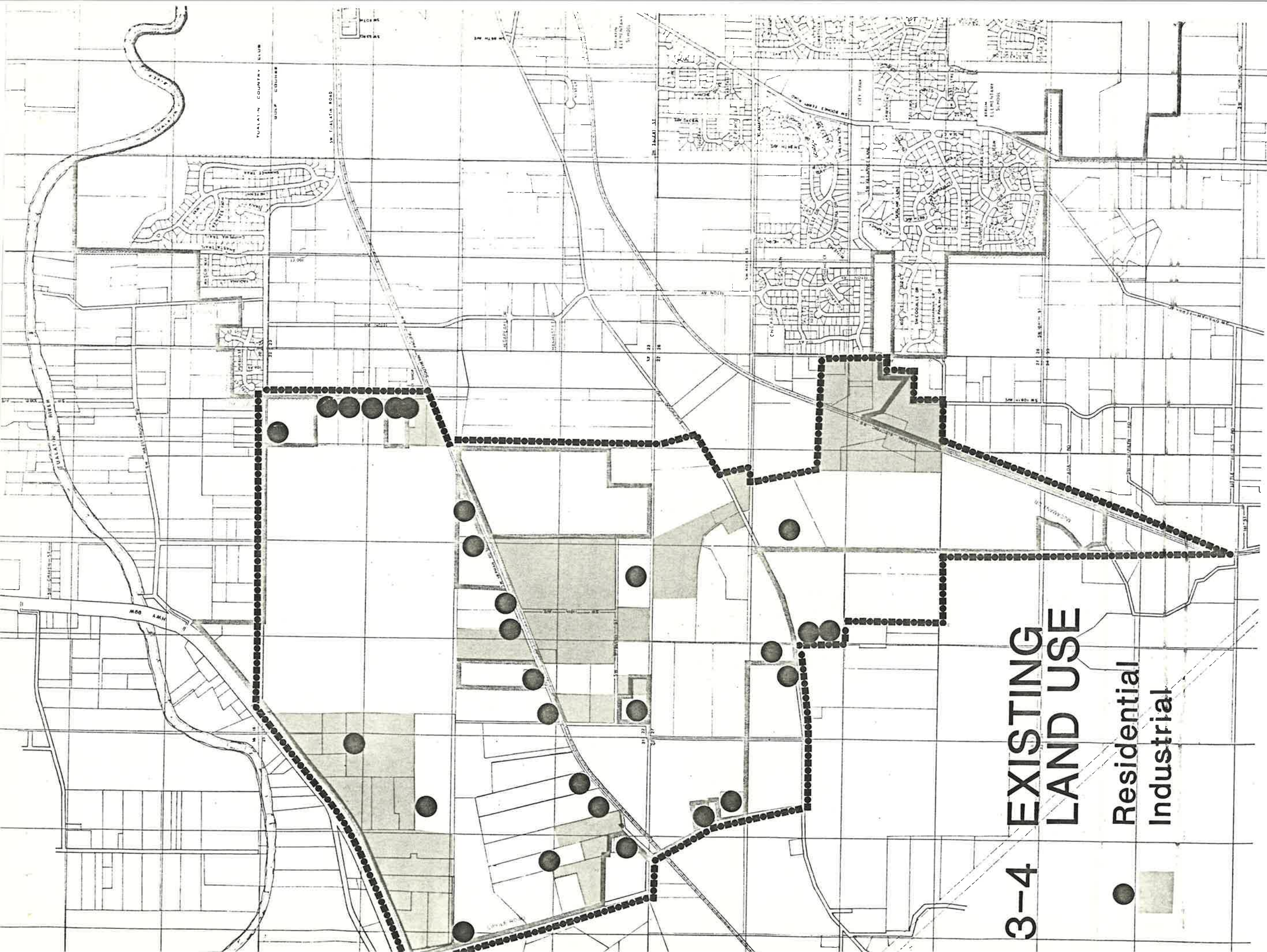
## INDUSTRIAL PLANNING AREA

| Map No. | Gross Acres | Number of Existing Lots | Built Out | Unbuild-able Land | Vacant Net Acres | Public Lands Factor | Net Buildable Acres |
|---------|-------------|-------------------------|-----------|-------------------|------------------|---------------------|---------------------|
| 21A     | 104.17      | 14                      | 2.01      | 39.02             | 63.14            | .80                 | 50.51               |
| 21D     | 147.62      | 17                      | 11.68     | 0.00              | 135.94           | .80                 | 108.75              |
| 22      | 217.12      | 1                       | 0.00      | 0.00              | 217.12           | .80                 | 173.70              |
| 22      | 4.29        | 1                       | 0.00      | 0.00              | 4.29             | .80                 | 3.43                |
| 22A     | 31.13       | 25                      | 1.94      | 0.00              | 29.19            | .80                 | 23.35               |
| 22C     | 143.23      | 21                      | 68.00     | 0.00              | 75.23            | .80                 | 60.18               |
| 22D     | 77.62       | 9                       | 1.20      | 0.00              | 76.42            | .80                 | 61.14               |
| 27A     | 17.52       | 17                      | 0.00      | 0.00              | 17.52            | .80                 | 14.02               |
| 27B     | 166.47      | 11                      | 12.12     | 0.00              | 154.35           | .80                 | 123.48              |
| 27D     | 14.73       | 11                      | 14.73     | 0.00              | 0.00             | .80                 | 0.00                |
| 28A     | 54.00       | 5                       | 4.34      | 0.00              | 49.66            | .80                 | 39.73               |
| 34A     | 8.91        | 4                       | 0.00      | 0.00              | 8.91             | .80                 | 7.13                |
| TOTAL   | 986.81      | 136                     | 116.02    | 39.02             | 831.77           |                     | 665.42              |

Table 3-4 goes here

Map 3-4 goes here      existing land use

# EXISTING LAND USE



the Industrial Planning Area, specifically 660.40 acres or 66.9%, is vacant and buildable.

- (8) Within the Industrial Planning Area, there are 19 homes with a 1983 census of 56 residents<sup>1</sup>. Most of these homes are of a rural residential use and generally are part of an agricultural operation. While some of these farm uses are very small, others are large and intensive in nature. It is anticipated that these uses will be maintained until such time as the property is needed for industrial development. The City's industrial planning districts allow farm use as a permitted use.
- (9) There are 41 existing industrial uses in the Industrial Planning Area some of which are within two developed industrial parks. Within the industrial area that was within the western portion of the City prior to the 1982 annexation of the Industrial Planning Area, there are 53 existing industrial uses, for a total of 94 in the entire Western Industrial District. These existing industrial uses occupy approximately 350 acres or 20 percent of the total industrial area. For the Industrial Planning Area, approximately 173 acres are developed representing about 16 percent of the area. Detailed inventory information can be found in the Industrial Development Factbook, however Tables 3-5A, 3-5B, and 3-5C, below, summarize the types of existing

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<sup>1</sup>City of Tualatin Census, 1983, Tualatin Planning Department industrial development in the entire western industrial

district:

**Table 3-5A**

**Numbers and Types of Industrial Land Uses  
Industrial Planning Area**

| Industrial Category           | Number    |
|-------------------------------|-----------|
| Automotive Repair             | 4         |
| Construction                  | 3         |
| Fabricated Metals             | 3         |
| Fabricated Metal Products     | 5         |
| Helicopter Accessories        | 1         |
| Machinery                     | 1         |
| Primary Metals                | 1         |
| Retail Fuel                   | 1         |
| Rubber & Misc. Plastics       | 1         |
| Stone, Clay, Glass & Concrete | 3         |
| Warehousing & Distribution    | 4         |
| Wood Products                 | 14        |
| <b>TOTAL</b>                  | <b>41</b> |

**Table 3-5B**

**Numbers and Types of Industrial Land Uses  
Existing City Industrial Area**

(Pre-November 1982 Annexation of Industrial Planning Area)

| Industrial Category                   | Number |
|---------------------------------------|--------|
| Chemicals and Allied Products         | 3      |
| Concrete Products                     | 1      |
| Construction                          | 5      |
| Dental Equipment & Supplies           | 1      |
| Electrical/Electronic Machinery       | 2      |
| Fabricated Metals                     | 8      |
| Fabricated Metal Products             | 3      |
| Fabricated Metal Products & Machinery | 5      |
| Motor Freight Transportation          | 1      |
| Paper Products & Engraving            | 1      |
| Printing                              | 2      |
| Printing, Publishing                  | 1      |
| (CONTINTUED)                          |        |
| Primary Metals                        | 2      |

|                               |    |
|-------------------------------|----|
| Primary Metals & Machinery    | 1  |
| Rubber & Misc. Plastics       | 1  |
| Sporting & Athletic Goods     | 1  |
| Stone, Clay, Glass & Concrete | 3  |
| Storage                       | 1  |
| Transportation Equipment      | 1  |
| Utility                       | 1  |
| Warehousing                   | 1  |
| Warehousing & Distribution    | 5  |
| Warehousing & Machinery       | 1  |
| Wood Products                 | 2  |
| TOTAL                         | 53 |

Table 3-5C

## Numbers and Types of Industrial Land Uses

## Total WESTERN INDUSTRIAL DISTRICT

| Industrial Category                   | Number |
|---------------------------------------|--------|
| Automotive Repair                     | 4      |
| Chemicals and Allied Products         | 3      |
| Concrete Products                     | 1      |
| Construction                          | 8      |
| Dental Equipment & Supplies           | 1      |
| Electrical/Electronic Machinery       | 2      |
| Fabricated Metals                     | 11     |
| Fabricated Metal Products             | 8      |
| Fabricated Metal Products & Machinery | 5      |
| Helicopter Accessories                | 1      |
| Machinery                             | 1      |
| Motor Freight Transportation          | 1      |
| Paper Products & Engraving            | 1      |
| Printing                              | 2      |
| Printing, Publishing                  | 1      |
| Primary Metals                        | 3      |
| Primary Metals & Machinery            | 1      |
| Retail Fuel                           | 1      |
| Rubber & Misc. Plastics               | 2      |
| Sporting & Athletic Goods             | 1      |
| Stone, Clay, Glass & Concrete         | 6      |
| Storage                               | 1      |
| Transportation Equipment              | 1      |
| Utility                               | 1      |
| Warehousing                           | 1      |
| Warehousing & Distribution            | 9      |
| Warehousing & Machinery               | 1      |
| Wood Products                         | 16     |
| TOTAL                                 | 94     |

(10) It can be seen that there is a large variety of uses, ranging from very light, such as electronics and printing, to heavy, including the production of primary metals and wood products. Also, there are some uses that can be considered more "commercial/industrial" in nature, including the sawdust fuel companies along Highway 99W, and the automotive repair shops.

(11) There are many opportunities for development in the Industrial Planning Area. There is one vacant property over 200 acres in size, six vacant parcels of between 30 and 50 acres, and 12 between 10 and 30. In addition, there are approximately 30 other vacant parcels of between one and ten acres. These present an excellent inventory of land intended to industrial uses. However, the urban facilities structure, in particular adequate streets, sewer, and water, is not complete to these properties. This structure will be critical to achieving the desired land use pattern. It is discussed in detail in the Public Facilities element of this plan.

(12) The "Industrial Development Factbook" breaks the western industrial area into six subareas, with three covering the Industrial Planning Area, and three covering the lands that have been within the City Limits. Each of these subareas was given a name for planning purposes. (See Map 2-1.) The land use issues within each of the Industrial Planning Area

subareas, and the specific recommendations and planning districts used in these areas are found in Section 9 of this Plan.

3.075      INDUSTRIAL LAND CONSUMPTION

- (1) The 1979 Tualatin Community Plan projected industrial land consumption at 9 to 15 acres annually. This was based on historic trends to the late 1970's and on the City share of the projected Metro employment growth to the year 2000. This projection may be very low, however, based on: 1) the much larger amount of industrial land now within the City than in 1978, 2) the enhancement of this area as a major industrial district through the creation of the necessary public facilities, 3) the growing industrial character of the area, and 4) the supportive government position. This seems to be borne out by the continued high rate of growth of industrial users even during the recession of the early 1980's.
- (2) Tables 3-6 and 3-7, below, portray the industrial growth of the City during the last decade. They show that the original plan projections of 9 to 15 acres per year have not been borne out, as the annual consumption for the last 11 years has averaged 23 acres with 25 acres during the last 5 years. Building construction has averaged almost a quarter million square feet each year for the last five years. With the provision of public facilities to the Industrial Planning Area, and hopefully with the placement of at least one very large employer in the area to serve as a catalyst, this growth rate should be maintained if not substantially exceeded.

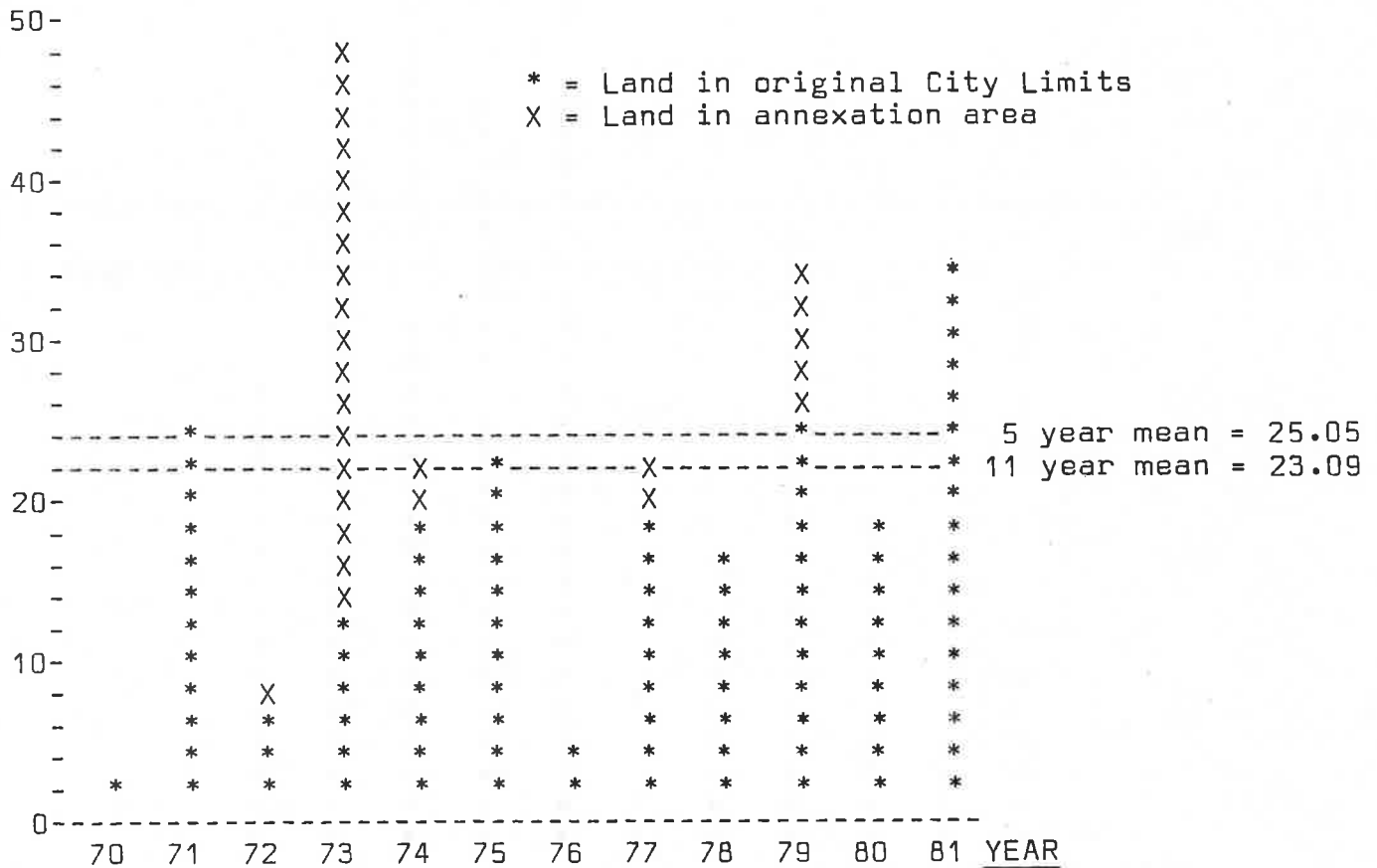
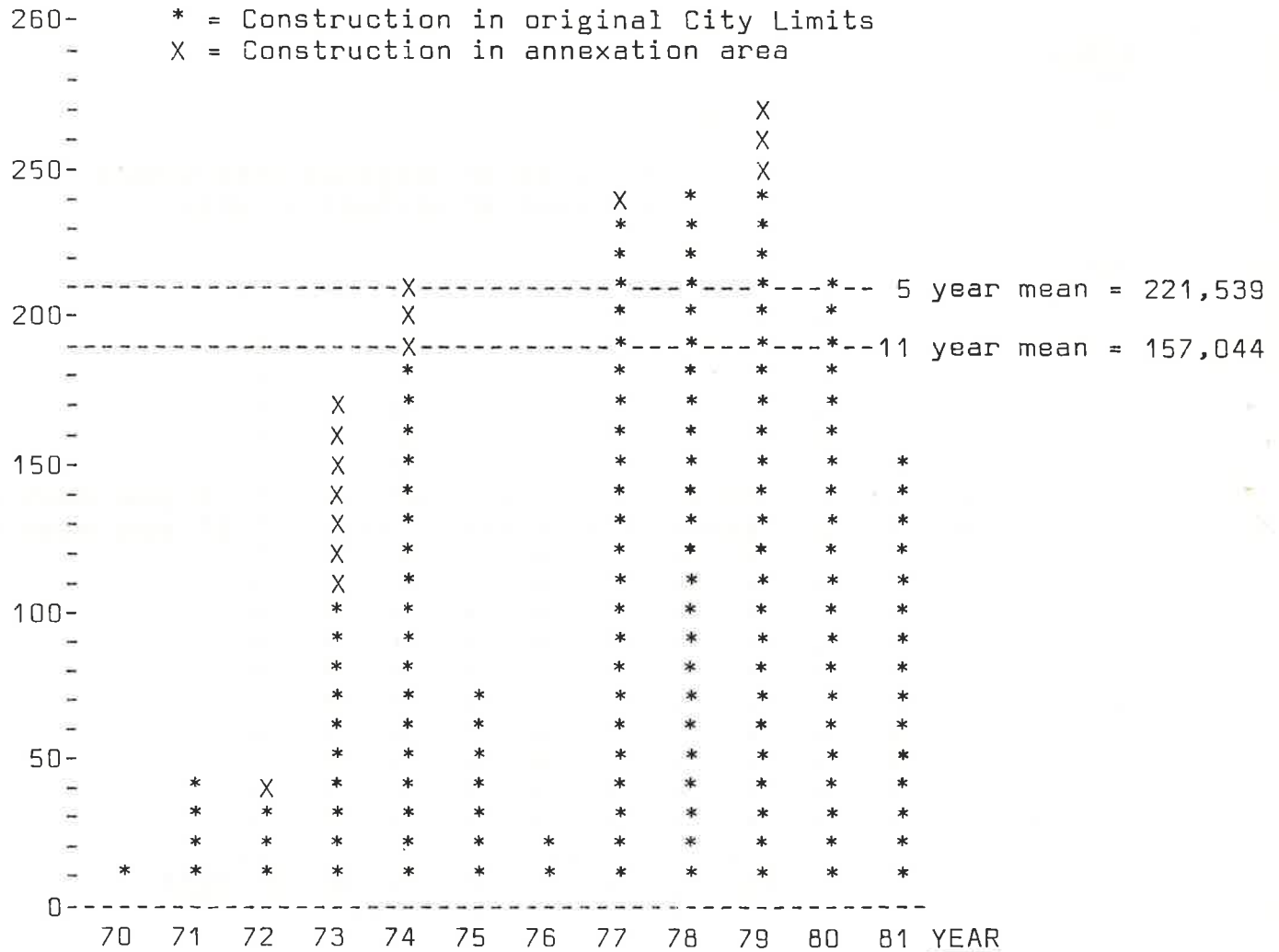
TABLE 3-6INDUSTRIAL LAND CONSUMPTION BY ACRES WITHIN  
THE CITY LIMITS INCLUDING THE ANNEX AREAACRES

TABLE 3-7INDUSTRIAL CONSTRUCTION WITHIN THE  
CITY LIMITS INCLUDING THE ANNEX AREASQ. FT.  
(X1000)

- (3) Using an assumption that general and light manufacturing districts will have an average employment density of 15 employees per acre and campus manufacturing will have a

density of 30 employees per acre, the following employment projections are made. These show the amount of employees that can be expected within the area at build-out.

TABLE 3-8  
EMPLOYMENT PROJECTIONS  
INDUSTRIAL PLANNING AREA

| I<br>I<br>I<br>I<br>I | I<br>I<br>I<br>I<br>I     | I<br>I<br>I<br>I<br>I      | I<br>I<br>I<br>I<br>I       | I<br>I<br>I<br>I<br>I                | I<br>I<br>I<br>I<br>I             | I<br>I<br>I<br>I<br>I |
|-----------------------|---------------------------|----------------------------|-----------------------------|--------------------------------------|-----------------------------------|-----------------------|
| Map<br>No.            | Net<br>Buildable<br>Acres | Employ-<br>ees per<br>Acre | Total New<br>Employ-<br>ees | Approximate<br>Existing<br>Employees | Approximate<br>Total<br>Employees |                       |
| 21A                   | 50.51                     | 15                         | 757                         | 30                                   | 787                               |                       |
| 21D                   | 108.75                    | 15                         | 1,630                       | 175                                  | 1,805                             |                       |
| 22                    | 173.70                    | 30                         | 5,210                       | 0                                    | 5,210                             |                       |
| 22                    | 3.43                      | 15                         | 51                          | 0                                    | 51                                |                       |
| 22A                   | 23.35                     | 15                         | 350                         | 29                                   | 379                               |                       |
| 22C                   | 60.18                     | 15                         | 902                         | 1,020                                | 1,922                             |                       |
| 22D                   | 61.14                     | 15                         | 917                         | 18                                   | 935                               |                       |
| 27A                   | 14.02                     | 15                         | 210                         | 0                                    | 210                               |                       |
| 27B                   | 123.48                    | 15                         | 1,852                       | 181                                  | 2,033                             |                       |
| 27D                   | 0.00                      | 15                         | 0                           | 220                                  | 220                               |                       |
| 28A                   | 39.73                     | 15                         | 595                         | 65                                   | 660                               |                       |
| 34A                   | 2.11                      | 15                         | 31                          | 0                                    | 31                                |                       |
|                       | -----                     | ----                       | -----                       | -----                                | -----                             |                       |
| TOTAL                 | 660.40                    |                            | 12,505                      | 1,738                                | 14,243                            |                       |

## 7.015 COMMUNITY OVERVIEW

- (1) The Industrial Planning Area is located in the southeastern portion of Washington County and immediately west of the developed portion of the City of Tualatin. It is within the Urban Growth Boundary and was recently annexed to Tualatin, except for a few individual parcels.
- (2) The Industrial Planning Area is served by Pacific Highway (Highway 99W) as a direct route to Portland. It also is tied directly by Tualatin-Sherwood Road, and indirectly by Tualatin Road and Herman Road, to Interstate 5 with direct ties to the east via Interstate 205. It is crossed by Southern Pacific and Burlington Northern railroad lines.
- (3) The area lies in the relatively flat lowlands of the Tualatin Valley,, with farmland scattered throughout. Although the area is currently rural and suburban in nature, increasing pressure for development is occurring. This is noted by the construction of several new industrial uses within the planning area during the last 10 years and the rapid growth of industrial use in the western portions of the City.
- (4) The first settlement in the area was established in the mid-1800's. By the 1850's, all the land along the Tualatin River bank had been claimed and settlement began in earnest. The Technical Memoranda of The Tualatin Development Code

provides a more detailed history of the City and its surrounding area.

- (5) The Industrial Planning Area encompasses approximately 1,096 acres. Coupled with the industrial land that was already in the western portion of the City, the total Western Industrial District has 1,775 acres of land.
- (6) The Tualatin area has experienced tremendous growth in the last decade. Population increased rapidly due to several factors, including land availability and buildup of employment opportunities through industrial development.
- (7) The economy of the planning area is tied directly to that of Washington County and the Portland metropolitan area. At this time only 12% of Tualatin residents work in the City, while approximately 75% of the employees within the community live outside. Again, the City has determined that it is a Community goal to expand as a regional employment center, increasing its percentage of total jobs in the region, and at the same time, providing additional residential and commercial opportunities so that more people can both live and work in Tualatin.

#### 7.016 PLANNING CONTEXT

- (1) INTRODUCTION. The preparation of the West Tualatin

Industrial District Plan Amendment is not an isolated planning effort. There are many other policies on the local, regional and state level that provide the framework for this planning effort.

- (2) LOCAL PLANS. Of primary importance is the City's comprehensive plan, The Tualatin Community Plan. This plan amendment must be set in a direction that complies with and helps to implement the goals, policies and objectives of that document. Since the plan was adopted on October 22, 1979 the City has continued to experience a high rate of growth and has maintained an aggressive posture toward economic development. The addition of these industrial lands to the City is a direct result of the Goals and Objectives of the Plan. This amendment is designed to continue the advances that the Plan charted and the City has followed.

(3) REGIONAL PLANS.

- (a) The Industrial Planning Area and the entire City are part of the Metropolitan Service District (METRO), a regional government with jurisdiction for the urban portion of the tri-county metropolitan area. METRO is authorized by state law (ORS 197) to: 1) establish regional planning goals; 2) develop various functional plans for the district concerning housing, transportation, solid waste, drainage, and other region

wide issues, and 3) ensure that member jurisdictions conform to any regional planning elements which have been adopted by the METRO Council.

- (b) METRO is responsible, specifically, for defining and maintaining a regional Urban Growth Boundary (UGB). The UGB essentially delineates urban lands from rural and natural resource lands. Designed to include those lands needed to accommodate growth to the year 2000, the UGB must be respected and supported by METRO counties and cities in order for their comprehensive plans to achieve compliance with LCDC Goal 14 - Urbanization. The UGB forms the southwest boundary of the Industrial Planning Area.
- (c) Another regional planning effort that helps define this plan amendment is the work of Washington County embodied in the Comprehensive Framework Plan. This plan "allocates" the growth anticipated within the County to various geographic areas. This growth, in terms of both resident population and employment, was "assigned" on the basis of land availability, opportunities for economic development, transportation and utility availability, and other locational factors. The City will use these allocations as one of the bases for developing this plan amendment.

(d) In order to require and maintain effective coordination between Washington County and its various cities, including Tualatin, Urban Planning Area Agreements (UPAAs) have been drawn up. These identify areas of mutual planning interest and establish procedures allowing the cities and the County to exchange information and comments on development and to coordinate planning for development in these areas.

(3) STATEWIDE PLANING GOALS. Finally, at the State level, are the Statewide Planning Goals and Guidelines adopted by the Land Conservation and Development Commission (LCDC). The comprehensive plans of all cities and counties in the state must be directed towards meeting the goals, which include:

1. Citizen Involvement
2. Land Use Planning
3. Agricultural Lands
4. Forest Lands
5. Open Spaces, Scenic and Historic Areas, and Natural Resources
6. Air, Land and Water Resources Quality
7. Areas Subject to Natural Disasters and Hazards
8. Recreation
9. Economy of the State
10. Housing
11. Public Facilities & Services
12. Transportation
13. Energy Conservation
14. Urbanization

This amendment will address each of these goals as appropriate. However, it is not organized goal by goal, rather, it follows the format of the existing Community Plan and will deal with each goal in that framework.

## 7.017 PLANNING CONCEPT

(1) LAND USE PATTERN

(a) Washington County has been working for many years in determining appropriate locations and configurations for various land uses throughout the County. The basic concept decisions have involved the major deliniation between rural and urban land uses, and the appropriate locations for the various urban uses. These concepts, which are included in the Comprehensive Framework Plan, are based on professional analysis and input from a series of public hearings held in the fall of 1981. The conclusions for the basic concept all indicated that industrial development was and continues to be the most appropriate land use for the study area.

(b) With the annexation of the Industrial Planning Area to the City of Tualatin, the responsibility for determining this planning concept has shifted from the County to the City. However, Tualatin has determined that the County's basic analysis and conclusions are sound, and will continue to support and plan for future industrial use in this area. This is recognized as being totally in compliance with the City's goal of becoming a major employment center, and forms a natural extention of the existing industrial areas bordering

the western edge of the former city limits.

(3) HOUSING AND EMPLOYMENT ALLOCATIONS

(a) Allocations of new housing units and employment opportunities in terms of residential, commercial and industrial acreage have been made for each community planning area within the entire METRO UGB by METRO with the cooperation of each local government. This distribution of potential growth is necessary to show how future growth can be made compatible with the development concept and consistent with state, regional, and local plans and regulations.

(b) These area allocations together reflect the total county's share of the regional growth estimated for the year 2000 and beyond. For the existing unincorporated area of the county within the UGB (i.e. all land inside the UGB but outside the city limits of all cities in the county) approximately 90,000 additional people, 39,500 new homes, and 38,800 new jobs are expected by the year 2000. This allocation applies to the incorporated study area as it was prepared prior to the annexation.

(c) The Tualatin Development Code contains population projections that formed a basis of that planning effort

and are also used in this process. Those projections indicated that, if market trends are followed, the City of Tualatin will have a population of 28,721 by the year 2000, or an increase of 22,331 from the year 1980. This indicates that the City, meaning all lands within the total planning area, will absorb 24.8% of the growth that is projected for the unincorporated portions of the County within the UGB.

(d) The growth allocations are basically intended to be a planning tool that assures that the projected growth is accommodated in a manner that provides for adequate housing, public facilities and services and employment opportunities, "spreading" the need to absorb this growth fairly throughout the metropolitan area. Every jurisdiction has a legal responsibility to allocate enough land to meet the projected needs. Each community is to designate land in various use categories to accommodate the acreage totals assigned to it by METRO for low and medium density housing units and employment opportunities.

(e) In order to help assure that the rapidly changing needs for housing options were being met, the LCDC adopted an administrative rule setting certain "standards" for planning for new housing within the Portland metropolitan area, (known as the Metro Housing Rule). The City must provide the opportunity for a new

residential construction mix of 50% detached units to 50% attached units. In addition, the housing rule established an average residential density target for new construction of at least 8 units per net buildable area.

- (f) The County draft of the plan for the study area included an allocation of 8,372 new employees. This is distributed mostly at a density of 5 employees per acre. The City finds that this density projection is extremely low based on the current pattern in the area which is approximately 15 employees per acre. With the acreage available, the transportation and utility facilities available, and the very supportive attitude of the City, industrial land uses are anticipated that will generate three or more times the number of employees within the industrial planning area within the planning period.

- (g) Therefore, the City recognizes the employment allocations of the County, but, finding them too small, will not be bound by them in planning for the industrial area or in encouraging and fostering economic development.

7.020 Assumptions. The following are general assumptions used to formulate the Plan:

- (1) The City can be expected to use a minimum of 25 acres of industrial land annually.
- (2) Traffic access and sewer and water service problems associated with the Western Industrial District will be remedied as the area is developed.

7.030      Objectives.    The following are general objectives used to guide development of the Plan and that should guide implementation of the Plan's recommendations:

- (1) Encourage new industrial development.
- (2) Provide increased local employment opportunity, moving from 12 percent local employment to 25 percent, while at the same time making the City, and in particular, the Western Industrial District, a major regional employment center.
- (3) Improve the financial capability of the City, through an increase in the tax base and the use of creative financing tools.
- (4) Preserve, with minor exceptions, the City's existing industrial land.
- (5) Cooperate with Washington County, METRO, and the State of Oregon to study the methods available for providing

transportation, water, and sewer services to the Western Industrial District.

- (6) Fully develop the Western Industrial District, providing full transportation, sewer, and water services prior to or as development occurs.
- (7) Improve traffic access to the Western Industrial District from the Interstate 5 freeway through a new interchange at Norwood Road or a suitable and adequate alternative.
- (8) Cooperate with the Department of Environmental Quality and METRO to meet applicable air quality standards by 1987.
- (9) Construct a north/south major collector street between Tualatin Road and Tualatin-Sherwood Road in the 124th Avenue alignment to serve the industrial area.
- (10) Rebuild the Tualatin Road/Pacific Highway intersection to allow for substantially greater traffic flows.
- (11) Provide truck routes for industrial traffic that provide for efficient movement of goods while protecting the quality of residential areas.
- (12) Protect residential, commercial, and sensitive industrial uses from the adverse environmental impacts of adjacent

industrial use.

- (13) Protect adjacent land uses from noise impacts by adopting industrial noise standards.
- (14) Continue to protect the Hedges Creek Wetland from adverse impacts of adjacent development.
- (15) Continue to administer specific and enforceable architectural and landscape design standards for industrial development.
- (16) Encourage industrial firms to use cogeneration as a means to utilize waste heat from industrial processes and consider solar access when designing industrial facilities.

7.040     Industrial Planning District Objectives. This section describes the purpose of each industrial planning district.

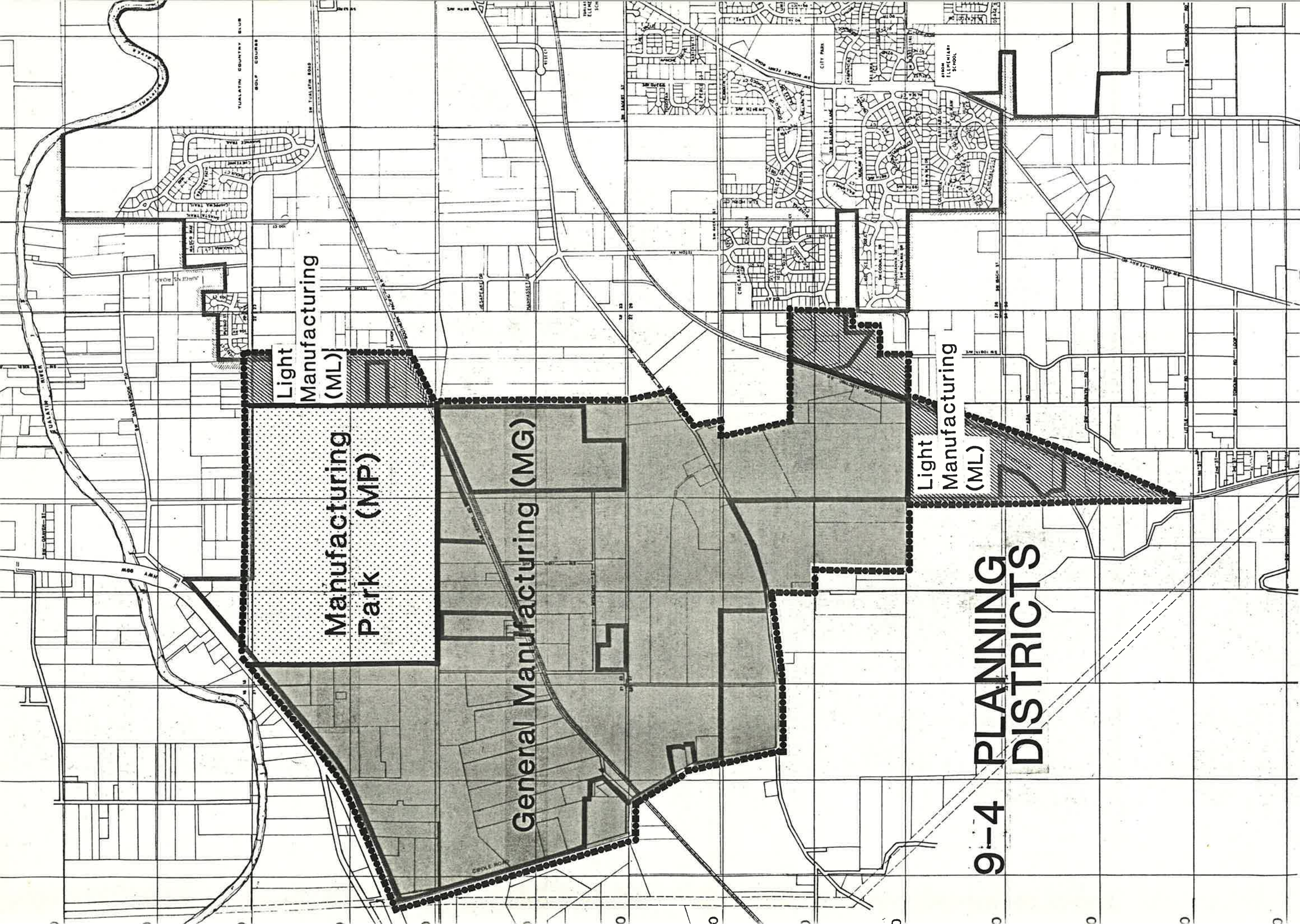
(3) Manufacturing Park Planning District (MP).

- (a) The purpose of this district is to provide an environment exclusively for and conducive to the development and protection of modern, large-scale specialized manufacturing and related uses and research facilities. Such permitted uses shall not cause objectionable noise, smoke, odor, dust, noxious gases,

vibration, glare, heat, fire hazard or other wastes emanating from the property. The district is to provide for an aesthetically attractive working environment with park or campus like grounds, attractive buildings, ample employee parking and other amenities appropriate to an employee oriented activity.

(b) It also is to protect existing and future sites for such uses by maintaining large lot configurations and limiting uses to those that are of a nature so as to not conflict with other industrial uses or surrounding residential areas.

(c) It also is intended to provide for a limited amount of commercial uses designed for the employees of the primary uses.



# 9-4 PLANNING DISTRICTS

9.039     Area 9 - LEVETON INDUSTRIAL AREA.   The Leveton area is marked by a great diversity of land uses and opportunities. Much of the frontage along Highway 99W has been developed for many years. The largest single undeveloped parcel within the Industrial Planning Area, and one of the largest in the entire Portland metropolitan region, is here. There is a great deal of vacant land available in a variety of acreages. The area includes approximately 522 acres of land of which approximately 33 are developed.

(1) TRANSPORTATION - This area has the potential of quickly developing as a major industrial site. It has good access to Interstate 5 via Tualatin and Herman Roads, Teton Avenue and the Tualatin/Sherwood Road bypass. It has excellent access from its northern portion to Highway 99. The Southern Pacific Railroad line lies immediately south of the area across Herman Road, however, there is no spur line crossing the road at this time.

(2) SEWER AND WATER

(a) Sewer and water lines are not far from the area, with twelve inch water lines approximately 600 feet to the east in 108th and Herman and 108th and Tualatin. Sewer is located approximately one quarter mile away both to the north and east, however the 1979 Sewer System Master Plan anticipates service coming into the area from its southeast corner as part of a new trunk line

system.

- (b) The 1979 Sewer and Water Master Plans included planning these essential services for this area, however, services anticipated in the 1979 plans goes to the western boundary of the Leveton property. The Public Facilities element of this plan amendment will deal in detail with the entire planning area.

(3) TOPOGRAPHY, SOILS, AND FLOODING

- (a) The Leveton area is marked by gently rolling terrain. Most of the area has slopes in the range of 0 to 10 percent with a few limited places, particularly in the north, having steeper terrain with slopes up to 20 percent. However, no undue difficulty is anticipated for development with these steeper areas because of their limited nature and the ability to build around them. The rolling nature of the area lends itself well to an effective storm drain system and gravity flow sewer system.
- (b) In the western portion of the Leveton area is an extension of the 100 year flood plain that covers the "Onion Flats," located in the Sherwood planning area. This area is a depression that is marked by poorly drained soils.

(c) Development on the properties falling into the flood plain will have to be designed to conform to the provisions of the Flood Plain Ordinance (Chapter 47, Tualatin Development Code), as well as having the structural design necessary to accommodate the soils limitations. The City's Storm Drainage Plan will provide for adequate drainage of normal runoff. However, it can be anticipated that these flooding and soil constraints will discourage any extensive development in this localized area.

(4) LAND USE - HIGHWAY 99W FRONTAGE

(a) The properties along Highway 99W pose difficult planning and design situations. The existing sawdust companies, primarily engaged in the distribution of sawdust as fuel, would be nonconforming under the City's industrial districts. While the storage of sawdust is permitted, direct sales are not. However, the extent of the retail activity is not great and is not perceived as a problem. Therefore, as part of this plan amendment process, the MG planning district is amended to allow the sales portion of the land use.

(b) There is a newly established metal forging plant also along the highway. Forge plants are specifically prohibited in the Planning District Standards. This is

part of the City's long standing policy of not allowing the heaviest of industrial uses in order to protect the environment for both the residents of the area and the lighter industries. The plant was approved by the County before the annexation. It is now a non-conforming use.

(5) LAND USE - HERMAN ROAD FRONTAGE

- (a) There is one industrial park in the area, the Herman Road Industrial Park, with a size of 9.5 acres. Approximately half of the park is developed.
- (b) The Herman Road Industrial Park is located on one of the lots within the Leveton Industrial Area that fronts on Herman Road. These lots generally are long and narrow in configuration, however the Industrial Park demonstrates that they can be successfully developed into viable industrial land uses. As this area is significantly separated from any residential area, the heavy industrial planning district is appropriate.

(6) LAND USE AND ECONOMIC DEVELOPMENT - LEVETON PROPERTY

- (a) The remaining area that has not been discussed is the Leveton property itself. This parcel of 217.12 acres has the size, shape, topography, and transportation

potential to be one of the premier industrial sites in the entire State. With the provision of sewer and water, and the improvement of Tualatin Road and its intersection with Highway 99, the Leveton property will be very attractive for the development of a "high technology" or other significant light industry.

(b) Economic Consultants Oregon, Ltd., prepared a report<sup>1</sup> for a citizen's committee studying the economic climate of Salem and creating an economic development plan<sup>2</sup>. This report dealt with factors that high-technology industry considers when looking for in selecting a plant site.

(c) The findings of that report, which are based on a survey of facility planners for high technology industries in the Santa Clara area, are very relevant to Tualatin's planning for the Leveton property. They give a basis for evaluation of the site's potential and give a framework for creating the appropriate land use controls necessary to encourage and ensure a high quality development. The report indicates that the site selection criteria used by most high technology

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<sup>1</sup>Economic Consultants Oregon, Ltd., A Survey of High-Technology Site Selection Criteria, a market report prepared for Rodney R. Stubbs & Company, May 1, 1981.

<sup>2</sup>Project 90 Committee, Safeguarding Salem's Future, a report for consideration by the Mayor and City Council, September 1, 1981.

firms include:

1. Political attitude of the community
2. Livability
3. Labor
4. Accessibility
5. Energy
6. Utilities
7. Taxes
8. Sites

(d) Below is a summary of the major findings and a brief discussion of Tualatin's conformance with the standard:

1. Political Attitude - The most important site selection criteria is the local political climate. The companies want to be sure that the local community and special interest groups have no major objections to their proposals. As well, the cooperative attitude, especially at the local City Hall and Chamber of Commerce, is critical. This is particularly true in the very early stages of a company's research into a community. Most companies regard effective land use planning as a positive factor in avoiding a repetition of the experiences of Santa Clara's "Silicon Valley." The companies want effective local planning to help assure a livable, workable, and stable

environment for their operations.

Analysis - The City of Tualatin meets this criteria very well. The City has long been committed to light industrial development on its west side. Already the City has a very high amount of industrial land use on a per capita basis, which is a direct foundation of the City's goal to be a major employment center. The City government has been supportive of this goal, evidenced by the creation of an Economic Development Coordinator position within the Planning Department and by close on-going cooperation with the Chamber of Commerce and various other groups interested in economic development. Probably the clearest evidence of this political attitude is the creation of this plan amendment, which creates a 1,775 acre industrial district that is unique in its scope and size within the state.

2. Livability - Livability means the quality of life within an area. It was found to be an important criteria for the industrial users who must not only work within a community, but live within it. In order to attract and keep the high quality professionals, managers, engineers and other

workers necessary for the use, the living environment must be very desirable. Among the livability factors considered are housing costs, outdoor recreation, shopping, cultural offerings, climate, education, health care, and services.

Analysis - Tualatin stacks up well in this category. It is working to create adequate residential areas to meet housing needs in a quality way. It has a very active Urban Renewal program that is concentrating on enhancing the character and shopping opportunities of the downtown area. It has an excellent educational system and a major hospital. And it is located in Oregon and in particular in the Portland area where the recreational, cultural, and educational opportunities are excellent.

3. Labor - There must be the potential within the immediate area to supply both highly skilled and entry level personnel because many companies will hire up to 95% of their employees locally. The size of the labor force should be at least 100,000 and the presence of other high technology firms with employees with transferrable skills is desired. Having nearby universities and colleges offering undergraduate and graduate courses in appropriate fields is a valuable asset.

Analysis - Tualatin meets these labor criteria. Being part of the Portland metro area gives it the population base. There are other nearby high technology firms such as Textronics in Wilsonville and Intel in Beaverton. The Tualatin area is readily served by Portland State University and Portland Community College as well as many other schools.

4. Accessibility - This refers to executive travel between the site and corporate headquarters or other branch facilities. It is critical to be within a one hour drive of an airport that provides direct links with the corporate headquarters, in most cases with the San Francisco or San Jose airports. The shorter this driving time, the better the site.

Analysis - Tualatin has a good physical relationship with Portland International Airport. While the City is quite a distance away, the airport can be reached via I-205 in a very few minutes. The accessibility criteria is met.

5. Energy - Many high technology firms use large amounts of energy in their manufacturing processes, in particular those involved in the basic silicon manufacturing processes. Power shortages in California have been a major reason why some companies are looking to locate out of that area. Any site chosen must have adequate and consistent power supplies.

Analysis - The Portland metro area has had adequate power supplies in the past. There is no record in the Tualatin area of any curtailment of power that has hampered industrial use. The area governments and utilities are planning for the power needs of the region to the year 2000 and beyond. There is a clear recognition that the state's economic development efforts must be based on adequate power if there is to be success.

6. Utilities - Of the firms surveyed, 80 percent indicated that sewer and water service had to be immediately available to the proposed sites.

Analysis - The Leveton property does not meet this criteria at this time. The Public Facilities element of this plan amendment will go into the details. However, it is critical to note that in all probability before anything will happen on the

property sewer and water service must be provided directly to the site.

7. Taxes - High technology firms are more interested in a city's long-term history of low taxes than in any short-term financial concessions or incentives. The city's overall cooperativeness is the strongest incentive for locating there.

Analysis - Table 9-1 below shows the average tax rates for the last eight years for Tualatin and typical rates for the Washington County portion of four other cities. It can be seen that Tualatin's rate compares favorably with the other locations. The table also indicates the City of Tualatin rate for each year.

TABLE 9-1  
TAX RATES FOR SELECTED  
WASHINGTON COUNTY CITIES

| YEAR  | BEAVERTON | WILSONVILLE | LAKE OSWEGO | PORTLAND | TUALATIN | CITY RATE |
|-------|-----------|-------------|-------------|----------|----------|-----------|
| 75-76 | \$30.04   | 24.76       | 24.28       | 31.66    | 22.16    | 1.53      |
| 76-77 | 27.87     | 25.83       | 24.26       | 29.75    | 21.06    | 1.46      |
| 77-78 | 25.33     | 24.84       | 23.01       | 25.99    | 21.02    | 1.33      |
| 78-79 | N/A       | 21.22       | 20.03       | N/A      | 17.94    | 1.09      |
| 79-80 | 18.59     | 18.46       | 17.76       | 19.81    | 15.71    | .81       |
| 80-81 | 21.38     | 21.58       | 18.47       | 21.68    | 18.37    | 2.12      |
| 81-82 | 28.90     | 24.10       | 23.05       | 25.94    | 23.88    | 3.59      |
| 82-83 | 28.30     | 25.63       | 22.95       | 26.18    | 24.17    | 3.36      |

8. Sites - The quality of a site, measured in visual appeal and image, is critical in its use for high technology industries and a very significant criteria. These factors are very important both in attracting and retaining engineers and in the market's perception of the firm and its products. There are four basic elements to this criteria:
- a. The capability to create a "campus" setting with elaborate landscaping, 10 percent to 30 percent of the site being used as a buffer from surrounding land uses, a 1 percent to 5 percent slope, and the presence of trees.
  - b. The character of the surrounding area is very important, both for image and compatibility. Other high technology firms, light industry, forest, and suburban residential areas are preferred. Heavy industry and warehousing are great detriments. Dense urban residential environments in the immediate area are not desirable but acceptable.
  - c. Railroads can be no closer than one-half to two miles from the site.
  - d. Within the survey, one group of respondents prefer sites of 20 to 45 acres, while another group preferred 80 to 200 acres. From 10 percent to 50 percent of the land is held for expansion on-site.

Analysis - The Leveton property does not meet all of these criteria, however the potential is there to still attract a significant user. The property meets subcriteria "a". There is a significant row of large fir trees along the northern property line bordering Tualatin Road, plus a small grove of trees in the central portion of the site. Its size and topography will lend themselves very well to the creation of a beautiful campus environment.

- (f) The property has the potential of substantial problems from the the surrounding area, in relation to subcriteria "b". To the west are the sawdust fuel companies on land that is proposed for the General Manufacturing (MG) district designation. The sawdust operations generate a certain amount of noise and particulate emissions that may not be compatible with a high technology use. However, the greatest threat is the possibility of establishment of a heavy industrial use after the sawdust operations have ceased that would definitely not be compatible with a use on the Leveton property.

- (g) To the south are other land designated MG. These also have the potential for uses that would degrade the general industrial character of the area.

(h) To the east are lands designated for light industrial use. There should be few if any problems from these areas as long as adequate buffering between the uses is assured.

(i) To the north, the plan designates the land across Tualatin Road for medium to high density residential uses. This does not conform to the "suburban" setting referred to in the criteria. However, the City has made a judgment that this area is appropriate for higher density residential use. There will be a need from the industrial uses themselves to have readily accessible residential opportunities. Plus, the statewide housing goal requires the City to achieve a certain overall housing density and these areas across from the Leveton property lend themselves well to development at higher densities to help meet the overall criteria. It is the decision of the City to allow the higher density development in this location despite the nearness to the industrial property. Use of the City's architectural review process to exert some design control will help if the protection of the campus industrial area is included as an appropriate criteria.

(j) The Southern Pacific Railroad tracks pass south of the property running from the southwest to the northeast. They touch the property at the southeast corner. No

portion of the property is farther than three fourths of a mile from the tracks. Obviously, subcriteria "c" is not met. There are usually two trips per day every day on the tracks, one northbound between 7 and 8 a.m. and one southbound between 4 and 6 p.m. The train serves rail customers in the McMinville area.

- (k) The property, with its 217 acre size, is uniquely suited for single industrial user that desires an extremely large site to accomodate large operations and possibly significant amounts of land for expansion, as discussed in subcriteria "d". However, there may be so few of these potential users that retention of the land as one piece is unrealistic in meeting the needs of the public and smaller potential industrial users. Division into four or five lots of at least 40 acres each would possibly give much greater possibility of success in marketing of the property and quicker creation of jobs and economic stimulus. This would still meet the basic elements of the fourth subcriteria.

- (l) The danger in this situation is that of excessive parcelization of the Leveton property. If the land was subdivided into many small parcels, even with a well conceived plan, it would waste a unique resource and opportunity.

(m) There are very few pieces of land that can be used to support the industrial activity that takes 40 or more acres, especially land that can support several such uses or a use that demands up to 200 acres. To divide the property into many smaller pieces destroys the unique opportunities for effective land utilization, traffic management, design planning, employment centralization, and economy stabilization that the large parcels provide. There are approximately 1,500 other acres of land within the Tualatin planning area that can meet the need for the smaller industrial lot. It is imperative that the Leveton property be preserved in a very large lot configuration.

(7) PLANNING ISSUES AND ALTERNATIVES - The Leveton area presents three distinct land use types in different areas: 1) the Highway frontage, 2) the light industrial lands along Herman Road and 108th, and 3) the Leveton property. This plan elements will discuss each, building on the assessments above, and present a specific land use plan. This plan is seen on Map 9-1a.

(8) The Highway 99W Frontage

(a) It was noted above that this area is marked by heavy industrial uses as listed in the planning district standards. There is a danger that future development

of this area may create uses that are not compatible with the campus industrial area to the east, or even with the higher density residential area planned for the lands north across the highway.

(b) However, a significant point is that this area is low in relation to the highway and surrounding properties. Activities on the sites are not readily visible from the surrounding area. This also helps to keep noise and dust contained. The City's planning district standards are more stringent in their development requirements, such as height and setbacks, than Washington County's. Plus, the City's Community Design Standards administered through the architectural review process give a means of obtaining reasonable design control. It is important to recognize the character of these properties as heavy industrial, but to assure that the land use does not conflict with or discourage development on nearby properties.

(c) The properties are all designated heavy industrial on the plan map. In response to the concerns discussed above, changes have been made to the planning district standards. These include the following:

1. A revision of the Permitted Uses to allow sale of rock, gravel, sawdust, coal or topsoil in addition to storage.

2. The Setback requirements and Landscaping, Enclosure, and Screening requirements have been amended to provide the same requirements adjacent to a campus industrial area as are provided adjacent to residential areas.

(9) Herman Road Frontage

- (a) This area is largely undeveloped with industrial activities. Fully effective development may be limited due to the long and narrow configuration of the lots. However, the potential exists to create several industrial parks or larger uses, especially if there is the ability to combine parcels to create width. The City should encourage this combining of lots whenever feasible in order to create better sites for development, and as an effort to minimize driveway access onto Herman Road.
- (b) Several of the properties back onto the proposed Leveton campus industrial area. There is a possibility of conflict with a user of the Leveton property. However, the amendments to the planning district standards discussed above should help alleviate any problem.

- (c) The Heavy Manufacturing district is planned for this area as it is well separated from the residential areas. This will give it the greatest flexibility for development.

(10) Leveton Property

- (a) The Leveton property presents unique planning opportunities that must be protected in order to assure the greatest benefit to the Community from development of the property. Neither the ML or MG planning districts are appropriate for the property as they include uses that are not appropriate for a campus industrial setting. Also they have development standards that neither encourage or mandate the campus environment, and they have a minimum lot size of 20,000 square feet. An industrial subdivision on the property that utilized the minimum lot size, or even lots of five to ten acres would thwart the efforts to create a campus industrial site and would destroy an valuable economic resource of the community and the region.
- (b) The review above of the Leveton property in relation to the high-technology industry siting criteria reveals that the property may not be ideally suited for "pure" high technology applications. The City should not limit the property to the electronics industry, but should consider other uses of a "light" nature that are

substantial enough to successfully develop in a campus environment on parcels of 40 acres or more.

(c) It is clear that a special district needs to be created for this property. This plan amendment includes the creation of the Manufacturing Park (MP) Planning District. The district is designed with the following major features which relate to the discussions above:

1. Minimum lot size of 40 acres.
2. Uses limited to very light industrial emphasizing electronics, textiles, sporting goods, distribution, publishing, etc.
3. Extensive landscaping requirements.
4. Strict height and setback standards.

9.040     Area 10 - WALGRAEVE INDUSTRIAL AREA.   The Walgraeve area has excellent development potential. It contains a very high percentage of large (10+ acre) lots and is largely undeveloped. It contains approximately 380 acres with approximately 86 acres developed. Some of the largest industrial users within the community are in this area.

(1)   TRANSPORTATION.   The Walgraeve area is very well served with industrial arterials. It is bordered on the north by Herman Road and on the south by Tualatin-Sherwood Road, which connects directly with Interstate 5. Access to Highway 99W is via Cipole Road which borders the area on the west. The Southern Pacific Railroad line is immediately south of Herman Road and provides excellent rail access for many of the existing uses and vacant properties.

(2)   WATER.   Water currently abuts the area on the eastern side. Further extensions will be necessary to service the balance of the properties, as is discussed in the Public Facilities element.

(3)   SEWER is separated from the property by about 1,500 feet. Extensions will be necessary to accomodate substantial new industrial development. The Public Facilities element of this plan provides specific details.

(4) TOPOGRAPHY, SOILS, AND FLOODING

(a) The Walgraeeve area is generally flat in nature with slopes of zero to 12 percent with the steeper areas being very limited. No development limitations from steep slopes are present.

(b) None of the property falls in a mapped 100 year floodplain, however there is a depression area in the middle of the site that is subject to extensive standing water during the rainy season. This pond when at its fullest can cover up to 10 acres of land. In order to be utilized for industrial development, other accommodations must be made for this water. However, it must be recognized that this area serves as an important detention system for storm water runoff. By simply filling the area this water will only be displaced to other areas, probably with undesirable consequences. Any development must include a very well designed storm drainage system that either provides for effective removal of the water from the area and appropriate disposal, or that incorporates detention on-site in one or more ponding systems with slower runoff or absorption. Both of these options are anticipated and mandated by the City's storm drainage plan. The building permit review process must take these needs into account.

- (c) An additional significant feature of the area is an extension of the Hedges Creek Wetlands into its eastern portion, specifically onto the Walgraeve property. This area was discussed in the Natural Features element of this plan document. A small portion of the property is actual wetland while the balance generally forms a wetland fringe. They are mapped as such and included as part of the City's Wetland Protection District.
- (5) LAND USE. There are nine industrial users in the Walgraeve area at this time. All are relatively large in scope and occupy lots of five acres or more. Almost all of the vacant land within the area is in larger lots, with three over ten acres and three others over 30 acres. There do not appear to be any constraints on the continued development of the area in a pattern similar to that found today.
- (6) PLANNING ISSUES AND ALTERNATIVES

(a) This is a homogenous industrial area, reflected by relatively intense development on larger lots. With the large lot sizes prevailing in the area, it can be expected that the area will "fill out" quickly once adequate sewer and water services are available.

(b) With all of the large vacant lots there is a distinct possibility that a scattered partitioning pattern could

emerge as properties are divided to accommodate the specific needs of a single use. Unguided partitioning can create inefficient land use, coupled with inefficient and possibly hazardous transportation and utility systems. It is important that all development be guided by an overall master plan for total properties, incorporating well laid out subdivision or planned development designs.

- (c) The MG (General Manufacturing) Planning District is to be used in this area, as it reflects many of the existing land uses and gives the greatest flexibility without danger of negative influences on residential uses as none are in the area.

9.041     Area 11 - KOCH INDUSTRIAL AREA.   The Koch industrial area has some of the most intense industrial development of the Industrial Planning Area, and at the same time, some of the most significant land in natural states. The area is oriented on a north/south basis generally lying between the Burlington Northern Railroad on the east and the Metro UGB on the west. There are approximately 198 acres with 54 developed. The Tri-County Industrial Park, which straddles the rail line, makes up all of the developed property.

(1)   TRANSPORTATION

(a)   Access to the total area is somewhat limited. The industrial park has access to 105th Avenue which connects to Avery Street and from there to Boone's Ferry and Tualatin-Sherwood Road to the freeway. The most northern portions of the property border on Tualatin-Sherwood Road and Avery and therefore have excellent access.

(b)   The southern portions, lying immediately west of the tracks, however, have poor access. Effective local circulation systems will have to be developed, with access through other properties, to serve this area. The southern portion drops away from the tracks at a slope of eight to ten percent, making rail access somewhat difficult.

(2) SEWER. There is a 10 inch sewer line in 105th Avenue bordering the Koch industrial area. However, extensions into much of the vacant area will be difficult as the property falls away from the line. A coordinated sewer plan, possibly integrating a pumping station, will be necessary to provide the service to the area. The Public Facilities section discusses this in greater detail.

(3) WATER. 12 inch water lines are in both Avery and 105th Avenue serving the area. The 1979 sewer and water plan anticipates providing water service to the internal portion of the site with a new 12 inch main along its western boundary.

(4) TOPOGRAPHY, SOILS, AND FLOODING

(a) The northern half of the area has slopes that generally range from zero to 12 percent. Land slopes in the southern half reach 20 percent in some parts. Development in the southern half will be limited by the slopes as special engineering designs will be required. This will limit the desirability of developing the area as opposed to alternative lands elsewhere in the industrial district.

(b) The southern half of the Koch area is heavily forested by a mixture of conifer and deciduous trees. This

forest serves as a wildlife habitat and prevents erosion on the steeper slopes. Development of the property must minimize the cutting of trees in order to protect the nature and stability of the area.

(c) The far southern tip of the area, involving Tax Lot 34A 1503, is the willow marsh that is part of the wetlands portion of the Tonquin Scablands. This is a significant natural area that is to be protected through the provisions of the Wetlands Protection District.

(d) The area is well drained, being served by the detention pond within the Tri-County Industrial Park and further natural drainage to west into the Tonquin area.

(5) LAND USE - NORTHERN HALF

(a) The Tri-County Industrial Park is a viable industrial enterprise that houses a variety of manufacturing firms. There are a substantial number of wood product industries in this area. Most of these firms are involved in secondary wood product processing creating consumer goods such as doors and joists.

(b) To the west and north of the industrial park are similar lands that have excellent road access and utility potential. There are some limited areas of

steeper slopes, however the large size of the lots will allow development around these problem areas.

- (6) LAND USE - SOUTHERN HALF. The southern half of the Koch area will be difficult to develop due to the slopes, forest cover, and wetlands area. Sensitive treatment of the land could provide sites for industrial uses that could integrate with the natural setting, however, as was said above, this land will probably not develop until much of the land farther north is consumed.

(7) PLANNING ISSUES AND ALTERNATIVES

(a) The northern half of the property will probably continue to develop in a pattern similar to that found within the industrial park. With proper street and utility improvements, this will form a solid land use foundation for the total industrial planning area. As the existing development has taken place under the provisions of the more intensive County zoning designation and since the vacant properties are buffered from the residential area, the General Manufacturing (MG) planning district is used.

(b) The need for sensitive treatment of the natural features of the southern area, coupled with its immediate proximity without buffering to residential areas, leads to use of the ML planning district.

31.020 Classification of Planning Districts. In order to carry out the objectives of the Tualatin Community Plan, land within the City is divided into planning districts. The established planning districts shall be designated on the Plan Map, and the planning district designations shall be as follows:

| <u>Planning District</u>           | <u>Abbreviated Designation</u> |
|------------------------------------|--------------------------------|
| Low Density Residential            | RL                             |
| Medium-Low Density Residential     | RML                            |
| Medium-High Density Residential    | RMH                            |
| High Density Residential           | RH                             |
| High Density Residential-High Rise | RH-HR                          |
| Office Commercial                  | CO                             |
| Central Commercial                 | CC                             |
| General Commercial                 | CG                             |
| Light Manufacturing                | ML                             |
| General Manufacturing              | MG                             |
| Manufacturing Park                 | MP                             |

44.010 LIGHT MANUFACTURING PLANNING DISTRICT (ML)

Amend Sections 44.070 (1), (2), (3), (5), and (6) by adding the words: "or Manufacturing Park (MP)" between "residential" and "district."

Amend Sections 44.080 (1), (2), (3), and (4) by adding the words: "or Manufacturing Park (MP)" between "residential" and "planning."

Amend Section 44.090 by adding the following as subsection (2):

"(2) Height Adjacent to a Residential District. Where a property line or alley separates ML land from land in a

residential district, a building shall not be greater than 28 feet in height at the setback line. No building or structure shall extend above a plane beginning at 28 feet in height above the setback line and extending inward and upward at a slope of 45 degrees, subject always to the maximum height limitation set in subsection (1) above. "

45.010 GENERAL MANUFACTURING PLANNING DISTRICT (MG)

Amend Sections 45.030, 45.040, and 45.080 by deleting "MH" and replacing it with "MG."

Amend Section 45.020 (j) by adding the words: "and retail sale" between "Storage" and "of rock."

Amend Sections 45.060 (1), (2), (3), (5), and (6) by adding the words: "or Manufacturing Park (MP)" between "residential" and "district."

Amend Sections 45.070 (1), (2), (3), and (4) by adding the words: "or Manufacturing Park (MP)" between "residential" and "planning."

Amend Section 45.080 by adding the following as subsection (2):

"(1) Height Adjacent to a Residential District. Where a

property line or alley separates MG land from land in a residential district, a building shall not be greater than 28 feet in height at the setback line. No building or structure shall extend above a plane beginning at 28 feet in height above that setback line and extending inward and upward at a slope of 45 degrees, subject always to the maximum height limitation set in subsection (1) above."

## MANUFACTURING PARK PLANNING DISTRICT (MP)

45.210     Purpose. The purpose of this district is to provide an environment exclusively for and conducive to the development and protection of modern, large-scale specialized manufacturing and related uses and research facilities. Such permitted uses shall not cause objectionable noise, smoke, odor, dust, noxious gases, vibration, glare, heat, fire hazard or other wastes emanating from the property. The district is to provide for an aesthetically attractive working environment with park or campus like grounds, attractive buildings, ample employee parking and other amenities appropriate to an employee oriented activity. It also is to protect existing and future sites for such uses by maintaining large lot configurations and limiting uses to those that are of a nature so as to not conflict with other industrial uses or surrounding residential areas. It also is intended to provide for a limited amount of commercial uses designed exclusively for the employees of the primary uses.

45.220     Permitted Uses. No building, structure or land shall be used in this district except for the following uses when conducted wholly within a completely enclosed building, except off-street parking and loading, and outdoor storage when developed in accordance with Section 45.270.

(1) Chemical and physical science offices and laboratories.

(2) Engineering and cartographic offices and laboratories.

- (3) Manufacture, assembling and packaging of electronic equipment, instruments and devices.
- (4) Manufacture, assembling and packaging of optical equipment, instruments and devices.
- (5) Research offices and laboratories.
- (6) Testing offices and laboratories.
- (7) Manufacture, assembling and packaging of sportings goods providing however that primary processing of organic materials such as tanning of leather or rough milling of lumber is specifically prohibited.
- (8) Manufacture, assembling and packaging of textiles and clothing.
- (9) Manufacture, assembling and packaging of musical instruments and toys.
- (10) Printing and publishing.
- (11) Warehouse and distribution center, provided however, that direct retail sales to customers from such warehouse structures are prohibited and further

provided that the storage of hazardous wastes is prohibited.

(12) Other uses of similar character found by the Planning Director to meet the purpose of this district, as provided herein by section 31.070.

(13) Offices when part of a manufacturing use as listed in (1) through (12) above.

(14) Corporate, regional, or district office headquarters for any use permitted in this code, provided that the offices occupy at least 20,000 square feet and that no manufacturing is conducted where not otherwise permitted in this chapter.

(15) Public or private parking lot improved and landscaped in accordance with the provisions of Chapter 50.

(16) Accessory facilities and activities customarily associated with or essential to permitted uses, and operated incidental to the principal use.

(17) Public utility facilities essential to provision of utility services, but excluding construction or storage yards or maintenance facilities.

45.230 Conditional Uses. In an MP District, the following

uses are permitted as conditional uses when authorized in accordance with Chapter 32 of the Planning District Standards:

- (1) Automobile service stations.
- (2) Eating and drinking establishments.
- (3) Financial services.
- (4) Day care services.
- (5) Outdoor storage activity or mechanical equipment when proposed to occupy more than ten percent of the total lot area when part of and necessary for the operation of any permitted use.
- (6) Residence for a caretaker when necessary for security purposes.
- (7) Fire station.
- (8) Transit terminal or transfer station
- (9) Private or public recreation facilities including pools, tracks, tennis or racquetball clubs, golf courses, health clubs, etc.

45.240     Prohibited Uses.    The following uses are expressly prohibited in the MP District, except as otherwise provided in 45.220 and 45.230 of this chapter:

- (1)    All residential dwellings, except as otherwise provided pursuant to Section 45.230 of this chapter.
- (2)    All commercial uses defined by Chapters 41, 42, and 43, except as otherwise permitted pursuant to Sections 45.220 and 45.230 of this chapter.
- (3)    All industrial uses defined by Chapters 44 and 45 except as otherwise permitted pursuant to Sections 45.220 and 45.230 of this chapter.

45.250     Lot Size.    The following requirements shall apply when partitioning or subdividing land:

- (1)    The minimum lot area shall be 40 acres except in the case of a conditional use for which the Council shall set the minimum lot size necessary to accomodate the proposed use.
- (2)    The minimum average lot width shall be 500 feet.
- (3)    The minimum lot width at the street shall be 500 feet.
- (4)    For flag lots, the minimum lot width at the street

shall be sufficient to comply with at least the minimum access requirements contained in Section 50.153(8) to (12) of these standards, as approved by the City Council at the time of creation of the flag lot by subdivision or partitioning.

- (5) The minimum lot width at the street shall be 50 feet on a cul-de-sac bulb.

45.260 Setback Requirements. All structures except fences as otherwise provided herein, located in a MP district, shall conform to the following property line setback requirements:

- (1) Yards Adjacent to Streets or Alleys.

- (a) Within a MP district each lot adjacent to a street or alley shall have a required yard 100 feet in depth along the full extent of each lot line adjacent to a street or alley.

- (b) No buildings or structures shall be permitted in a required yard adjacent to a street or alley.

- (c) All parking shall be set back at least 50 feet from each street or alley right of way.

- (d) Driveways shall be set back at least 50 feet from each street or alley right of way except where the driveway provides direct access to the street or alley.

(2) Side and Rear Yards

- (a) All buildings, structures and loading docks shall be set back at least 50 feet from all property lines.
- (b) All parking and driveways except those providing direct access to a streets shall be setback 25 feet from the property line.
- (c) No spur rail track shall be permitted within 200 feet of an adjacent residential district.
- (d) No setbacks are required at points where side or rear property lines abut a railroad right of way or track.

45.270 Landscaping, Enclosure and Screening.

- (1) Each lot shall have not less than twenty-five percent of the gross lot area developed into and permanently maintained as open landscaped area. Required yards are included as part of the gross area of the lot.

- (2) All area of a lot not covered by buildings, structures, parking, loading areas, storage areas, or driveways shall be landscaped.
- (3) Properties abutting a residential planning district shall provide and perpetually maintain dense evergreen landscape buffers between uses permitted in the district and the adjacent residential planning district.
- (4) Outdoor storage of materials in this district shall be screened from the view of any adjacent public street or residential planning district by dense landscape buffers. The Architectural Review Board shall assure that the design meets in purpose of this District in achieving a campus or park like environment.
- (5) No fence shall be constructed within a required setback adjacent to a street right of way.

45.280 Structure Height. Within an MP district buildings and structures erected, altered, or enlarged shall not exceed 70 feet in height, subject to the following additional limitations:

- (1) Height Adjacent to a Residential District. Where a

property line or alley separates MP land from land in a residential district, a building shall not be greater than 28 feet in height at the 50 foot setback line. No building or structure shall extend above a plane beginning at 28 feet in height above that 50 foot setback line and extending inward and upward at a slope of 45 degrees, subject always to the maximum 70 foot height limitation.

45.290     Access. All lots created after December 1 1982 shall abut a public street.

46.300     Off-Street Parking and Loading. Refer to Chapter 50.

46.310     Environmental Standards Refer to Chapter 47.

46.320     Community Design Standards. Refer to Chapter 50.

CITY OF TUALATIN  
TUALATIN DEVELOPMENT CODE

PUBLIC FACILITIES PLAN -  
TRANSPORTATION ELEMENT  
PLAN AMENDMENT

PA 83-3

PUBLIC HEARING DRAFT

MARCH 28, 1983

## TRANSPORTATION

11.010 Background

(1) The automobile will most likely remain Tualatin's primary source of transportation in the Year 2000, the target year for "build out" of the planning area. While public transit service is expected to improve, it will not improve the city's overall transportation system significantly enough to avoid major improvements to the City's street network. Consequently, while this plan has references to public transportation and bicycle/pedestrian paths, the plan has been prepared primarily to predict the amount of automobile traffic that will occur on each major City street at "build out" and to recommend improvements to those streets. The plan is closely related to the City's land use plan in order to match land use intensities and traffic generation with the traffic carrying potential of each street corridor. Much of the analysis that this plan is based on was data prepared during the formulation of the 1983 Western Industrial Lands Plan Amendment, the 1983 Residential Lands Plan Amendment, and the 1983 Urban Renewal Plan Review. The traffic volume forecasting process is documented in a Technical Appendix by Associated Transportation Engineering & Planning, Inc.

(2) During this updating of the "Tualatin Public Facilities Plans, Transportation," specific community transportation problems were identified as follows:

- (a) Traffic congestion in the Nyberg Street/Tualatin-Sherwood Road corridor and other downtown points (these problems are addressed in the Urban Renewal Plan).
- (a) Poor access from Interstates 5 and 205 to the industrial areas located in Washington County, west of Tualatin in the western part of Tualatin and farther west in the Sherwood area.
- (b) Poor north/south access through the western portion of the City's industrial area.
- (c) Poorly designed streets and inadequate street right of ways for street improvements.
- (d) Through truck traffic in certain residential areas.
- (e) Poor transit service to downtown Portland and particularly to other suburban locations on the western side of the metropolitan region.
- (f) Lack of a fully developed interconnected bicycle/pedestrian circulation system.
- (g) Lack of funding to improve the City's roadway system and bicycle/pedestrian pathway system.

(3) An explanation of these problems follows:

(a) Heavy traffic movement in the Nyberg Street/Tualatin-Sherwood Road corridor occurs because this route provides access to the Interstate 5 (I-5) and Interstate 205 (I-205) freeways. Since Tualatin is a bedroom community most Tualatin residents commute outside of the City to work and since most of its residential development to date has occurred west of I-5, people use the Nyberg/Tualatin-Sherwood corridor to gain freeway access to their employment. This situation also works in reverse because Tualatin is a growing employment center and people commute here to jobs. Surveys that were conducted as part of the 1979 Plan indicated that 40.7 percent of Tualatin's residents commute to jobs in Portland and 30.4 percent to jobs in Tigard, Beaverton and Wilsonville. Conversely, only 12.4 percent of Tualatin's workers live in this community. Consequently, much of this volume is a peak-hour situation caused by employees traveling the freeways to their jobs. The City is currently working on a solution to this problem, as recommended in the City's Urban Renewal Plan. Prior to the development of the Tualatin-Sherwood Road "bypass" this area was subject to heavy congestion, however the new street alignments have greatly improved the situation. There is the potential that further and greater congestion

will occur in the near future as the community and its traffic grows.

(b) The large amount of industrial land located west of the retail area will adversely affect improvements in the Tualatin-Sherwood Road corridor unless alternative access routes are developed into this area. To help alleviate this potential problem, the City proposes three points of improved access to Interstate 5:

1. A proposed interchange at the intersection of I-5 and Norwood Road with a new expressway into the industrial area and connecting to Highway 99.
2. Access improvements on Lower Boones Ferry Road to the existing I-5/Carmen Drive Lake Oswego Interchange.
3. Ramp improvements on the Nyberg Street/I-5 interchange to increase flow capacity.

(c) The City's existing major streets are characterized by narrow right-of-ways, unimproved shoulders, uneven roadway surfaces, poor drainage, and poor sight distance. While the City has been making some progress in this area by requiring adjacent development to bear the burden of improvement, much of the City's roadway system remains improved only to a rural standard. Many

of these streets, especially in the western portion of the City are under County jurisdiction. The City and County are studying transferring the jurisdiction so that the City can take control of development and maintenance of these streets.

- (d) The central portion of the City's industrial area has traditionally had poor road access due to the lack of a north/south collector between Tualatin Road, Herman Road, and Tualatin-Sherwood Road. The lack of this connection has created the need for all traffic originating in the southern portion of the City desiring to travel to northern portions of the City to travel either through the downtown or use Cipole road at the western edge of the City's planning area. This situation has created additional traffic congestion downtown that would not otherwise occur. This Plan proposes a necessary north/south route that will increase convenience and lessen congestion in downtown. This situation caused heavy industrial traffic in the downtown area, especially on Boones Ferry Road. A solution was identified in the mid 1970's of constructing a new north/south collector street in the 102nd/104th corridor. This street, called Teton Avenue, has been built and goes from Tualatin Road on the north to Avery Street on the south. It has proved to be a vital element in managing industrial traffic in the central area.

(e) The same situation now exists again for the expanded industrial area stretching to Cipole Road on the west. A distance of approximately one and one half miles separates the north/south collectors of Teton Avenue on the east and Cipole Road on the west. In order to facilitate efficient truck and automobile movements in the area, which is an important component of its successful economic development, another north/south collector in the central portion is necessary. This plan proposes this new street in a corridor that approximately follows the 124th avenue alignment. This collector is more fully described in the street discriptions below.

(f) The City has many roadways dividing industrial and residential portions of the community and several residential streets lead directly to industrial areas. Demands for truck traffic on these routes will greatly increase in the future with continued development in the new major industrial area in the western portion of the City. Because of this situation, truck traffic has become a major concern to residents. Truck noise and concern for childrens' safety has led to a very strong effort in this plan to clearly define truck routes that minimize impacts on the residential neighborhoods. This includes routings on existing streets, but also

depends on new routes, such as the proposed 124th Street and the Norwood/Cipole connection, to effectively handle this problem.

- (g) Existing public transit service is generally low in frequency and provides slow service to primarily downtown Portland. This service is provided by the Tri-County Metropolitan Transit District (Tri-Met). They are working on plans for eventual service improvements. It is critical, however, the Tualatin take an active role in participating in the transit planning for the City. In order to achieve its community development goals, the City must press for sufficient service to meet the needs of this new employment area. Almost 15,000 new employees are projected for the Western Industrial District. Coupled with a projected 10,000 employees for the existing industrial area and a year 2000 transit ridership of 10%, peak hour transit demands for up to 2,500 employees from throughout the Portland metropolitan area are expected. This represents a significant increase in the number of busses serving the area, and probably indicates that new and expanded routing and scheduling will be necessary.

- (h) The City has two bicycle/pedestrian pathways, one running south along Boones Ferry Road and one running northwest along Tualatin Road. Both serve residential

subdivisions and provide an alternate transportation link to downtown. The design standards on these paths are generally poor and they should eventually be replaced when the adjacent roadways are reconstructed. There is also a need to provide a complete system of bicycle/pedestrian pathways to connect all portions of the City with an alternate transportation network and to connect this system into the City's park and recreation system. There is a particular need to provide bicycle/pedestrian access to the newly developing areas east of I-5. Detailed planning for bicycle facilities is part of the City's Parks and Recreation Plan.

- (i) As with any community, lack of adequate funding for all needed transportation improvements is a continuing problem. Because of the City's rapid growth, the City has a difficult time keeping pace with increased traffic caused by new development. This situation causes pressure for growth controls and moratoriums which, in turn, create pressure on land and housing prices. While the City has received considerable road improvements from adjacent new development, and has made great improvements in the Downtown area, some of the improvements are discontinuous and do not address the need for improved arterial streets adjacent to areas that are already developed.

- (j) The City is served by two railroads which cross Tualatin's street network at seven points. With the exception of I-5, all rail crossing are at the grade of the street. Five out of seven crossing are signalized.
- Rail use today is relatively infrequent and auto-train conflicts minimal. However, increased use of rail for freight transport from the large developing industrial areas may cause longer and more frequent delays.

11.020 General Assumptions. The following are general assumptions used in the formulation of this Plan:

- (4) Until more job opportunities are created in Tualatin, the large majority of workers will continue to commute to jobs outside of the City.
- (1) By the Year 2000, Tualatin lands will be fully developed, including the 1,775 acre Western Industrial District.
- (2) In the long term, public transit service and other alternative modes of transportation will become more attractive as gas prices continue to increase and as service becomes better due to increased population and public demand. A transit ridership rate of 10% and a rideshare rate of 30% is projected for employee trips. However, private automobile use will still be the primary mode of transportation.

- (3) Bicycle/pedestrian pathways will encourage some reduction of automobile trips.
- (4) The roadway system, during the AM and PM peaks, will function at Service Level "D" at "build out."
- (5) Further industrial growth in the western portion of the City will adversely affect transportation throughout the community unless Construction of new transportation facilities are constructed is essential to better tie the area into the regional transportation system. This will be increasingly important as industrial development continues in the western portion of the City.
- (6) Travel patterns will be 10% to the west, 10% east, 20% south, and 60% north out of the City.
- (7) The ratio of residents that work within the community will raise from 12% today to 25% in 2000.

11.030 Objectives of the Transportation Plan. The objectives of the Transportation Plan are to:

- (1) Support Washington County's proposal to realign Durham Road to provide a direct connection from Highway 99W to the Carman Drive/I-5 Interchange.

- (2) Provide a system of streets and other forms of transportation which link each part of the community into a unified whole, and one which will safely, efficiently, and economically move traffic to and through the area when it is fully urbanized.
- (3) Provide a transportation system that is adequate to handle the truck and automobile traffic from the Western Industrial District in such a way to encourage the industrial development of the area, the preservation of existing residential neighborhoods, the minimization of industrial traffic and congestion in the downtown area, and the successful implementation of the City's economic development goals.
- (4) Construct a City transportation system that is well integrated with other elements and objectives of the Tualatin Community Plan.
- (5) Prepare a transportation plan that includes all modes of transportation including private motor vehicle, public transportation, truck routes, rail, and bike and pedestrian pathways.
- (6) Minimize the adverse social, economic and environmental impacts created by the transportation system.

- (7) Provide for the transportation disadvantaged by complying with State and Federal regulations concerning this matter and cooperating with local county and regional agencies providing transportation services for the disadvantaged.
- (8) Support and assist whenever practical, the development of the metropolitan public transportation system, through cooperation with the Tri-County Metropolitan Transportation District (Tri-Met).
- (9) Develop transit systems and stations, park and ride systems, and related facilities in convenient and appropriate locations in order to adequately and efficiently serve the residential and employment populations.
- (10) Work to create or improve transit service within Tualatin and intercity transit service to the adjacent communities.
- (11) Provide a transportation system which will encourage energy conservation, both in terms of efficiency of the road network and in the standards developed for street improvements.
- (12) Coordinate planning of the City street system with the Regional Transportation Plan prepared by the Metropolitan Service District, working toward a fully integrated plan.

- (13) Work with surrounding local governments, Washington and Clackamas Counties, the Metropolitan Service District and the Oregon Department of Transportation, to develop alternate transportation facilities that will allow development of the Western Industrial District without major disruption of existing neighborhoods or downtown.
- (14) Preserve adequate right of way for a new freeway interchange at Interstate 5 and Norwood Road and for an expressway connection between this interchange and Highway 99W.
- (15) Preserve adequate right of way for a new collector street connecting Tualatin-Sherwood Road and Tualatin Road in the western portion of the industrial area, preferably in the general 124th Avenue alignment.
- (16) Establish an arterial street system which will attract and effectively accommodate all "through" trips to relieve residential collectors and other local streets from heavy and hazardous traffic burdens.
- (17) Preserve the maximum capacity of arterials by minimizing strip commercial and industrial development, and restricting driveway access as appropriate.
- (18) Develop a comprehensive noise ordinance and program to deal with noise generated by traffic.

- (19) Cooperate with the Department of Environmental Quality and the Metropolitan Service District to meet applicable air quality standards by 1987.
- (20) Coordinate the development of the pedestrian/bicycle system with plans developed by the Metropolitan Service District for these types of facilities.
- (21) Require developers to aid development of the roadway system by constructing a half street, or full street improvements, where necessary.
- (22) Locate proposed rail spur lines to minimize conflicts with adjoining land uses and streets.
- (23) Screen with landscaping railroad right of ways where they pass through or adjoin residential property.
- (24) Minimize the creation of new railroad grade crossings to reduce losses due to traffic delays and accidents, and to produce increased efficiency of railroad operation and increased public convenience.
- (25) Provide sidewalks on both sides of all fully developed streets within the city.
- (26) Develop a pedestrian/bicycle system linking residential

areas to other land uses and connecting parks, greenways and natural areas.

(27) Require developers to aid development of the roadway system by dedicating or reservation of needed right of ways and by adopting setbacks and other required standards that will keep buildings from interfering with future road requirements.

(28) Adopt an official map showing existing and future street rights of ways.

(29) Adopt an Maintain the official Street Landscaping Tree Plan.

(30) Incorporate a landscape element into the development plans of arterials and collectors.

(31) Develop a Capital Improvements Program and funding mechanisms for transportation facilities.

11.040 Street Classification and Standards. Street standards are a design form which relate to roadway function and operational characteristics such as traffic volume, operating speed and capacity. Street standards are necessary to provide a community with roadways which have been determined through extensive research and experience to be relatively safe, aesthetic, and easy to administer when new roadways are planned or constructed.

11.050     Functional Street Classifications.     The following subsections list the functional classifications of urban streets and define each.

- (1) FREEWAY.     The highest form of roadway design. This type of facility is intended to provide for the expeditious movement of large volumes of traffic between, across, around or through a city, region or state. The freeway is a divided highway with full control of access. It is not intended to provide access to abutting land. Complete separation of conflicting traffic movements is provided. Traffic volumes generally are higher than 30,000 vehicles per weekday.
- (2) EXPRESSWAY.     An expressway is intended to serve the same function as a freeway in areas where higher capacity and costly freeway design are not feasible. The expressway is a divided roadway with access provided only at signalized intersections or interchanges. It differs from a freeway in that it may have few or no grade separations. Because of this lack of separation, the expresswy generally has more access points and, thus, is more useful for shorter trips than the freeway. Traffic volumes generally range between 20,000 and 40,000 vehicles per weekday.
- (3) ARTERIAL STREET.     The primary function of an arterial street is to provide for the traffic movement between areas and

across portions of a city or region, direct service to principal generators, and connection to the freeway-expressway system. A subordinate function is the provision of direct access to abutting land. Since the primary function of this type street is movement of vehicles, arterial streets are subject to regulation and control of access, parking, turning movements, entrances, exits, and curb uses. Traffic volumes generally range between 5,000 and 35,000 vehicles per weekday.

(4) COLLECTOR STREET. Functions to conduct traffic between arterial streets, activity centers and neighborhoods. It is a principal traffic carrier within a neighborhood and also provides access to abutting land. There are two categories of collectors. A Major Collector is intended for areas with a projected vehicle volume of up to 13,000 vehicles per day. A Minor Collector handles up to 7,000 trips per day.

(5) LOCAL STREET. Provides access to abutting land. These streets serve local traffic movements and are not intended to accommodate through traffic. The traffic volumes would be less than 8,000 vehicles per weekday in residential areas.

(6) CUL-DE-SAC STREET. Functions as a local street providing access to abutting land. It is not a through street and contains a turn-around. Its volume should be less than 2,000 vehicles per weekday in residential areas.

11.060 Street Standards. Figure 11-1 indicates the recommended street width standards for each type of roadway. In some cases more than one standard has been indicated, depending on the availability of right of way. Each of these is a recommended standard. Specific conditions for each street project may demand that these standards be altered on a case by case basis.<sup>1</sup>

(1) EXPRESSWAY. Street Section F is a divided, four lane expressway without parking. It provides an 18 foot median (curb face to curb face) for landscaping and a 12 foot left turn lane at median openings for major driveways and intersections. Sidewalks similar to those with Section E should be provided. This cross-section requires a 102 foot right-of-way. Its traffic carrying capacity is approximately 34,000 vehicles per day.

(2) ARTERIAL STREETS

(a) These streets are intended to provide for the movement of traffic between areas and across portions of a city or region. Residential property should not face or be

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<sup>1</sup>Sources: Recommended Practices for Subdivision Streets  
Institute of Transportation Engineers.

Residential Street, Objectives, Principles and Design Considerations, the Urban Land Institute, American Society of Civil Engineers, and National Association of Home Builders.

Urban and Rural Paved Road Standards, Washington County

FIGURE 11-1  
STREET DESIGN STANDARDS

B Local or Cul-De-Sac Street. - 52' R.O.W.



C<sub>b</sub> Minor Collector Street with Bikelanes. - 60' R.O.W.



C<sub>p</sub> Minor Collector Street with Parking. - 60' R.O.W.



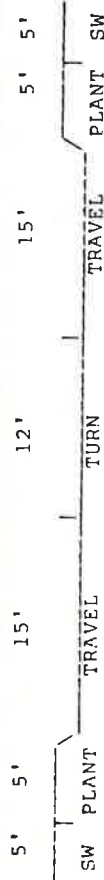
C<sub>b&p</sub> Minor Collector Street with Bikelanes and Parking. - 68' R.O.W.



D<sub>b</sub> Major Collector or Minor Arterial Street with Bikelanes. - 64' R.O.W.



D<sub>l</sub> Major Collector or Minor Arterial Intersection with Left Turn Pocket. Bikelanes Terminated 50' from Intersection. - 64' R.O.W.



D<sub>b&t</sub> Major Collector or Minor Arterial Street with Bikelanes and Continuous Left Turn Lane. - 66' R.O.W.



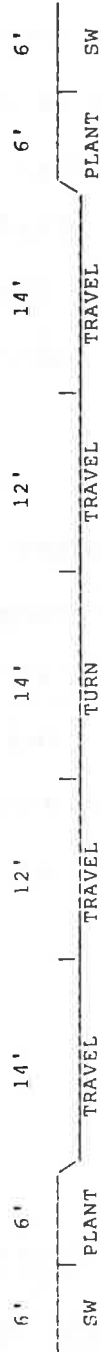
D<sub>b&p</sub> Major Collector or Minor Arterial Street with Bikelanes and Parking. - 64' R.O.W.



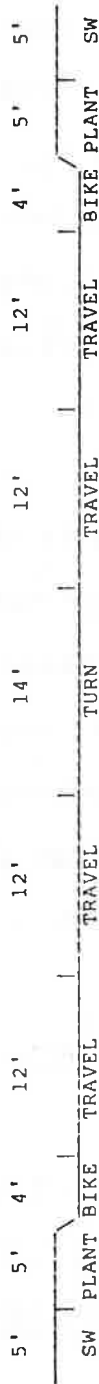
E<sub>b</sub> Major Arterial Street with Bikelanes. - 80' R.O.W.



E<sub>t</sub> Major Arterial Street with Continuous Left Turn Lane or Intersection with Left Turn Pocket. Bikelanes Terminated 50' from Intersection. - 90' R.O.W.



E<sub>bst</sub> Major Arterial Street with Bikelanes and Continuous Left Turn Lane. - 90' R.O.W.



F Expressway. - 102' R.O.W.



provided with access on arterial streets. If the arterial street volume is forecast to be less than 14,000 vehicle trips per day, then the ~~cross-sections~~ Street Sections  $D_b$  and  $D_i$  for a collector street could be utilized on a case by case basis. For areas where the arterial street volume is forecast to be in excess of 14,000 vehicles per day the  $E_b$ ,  $E_t$ , or  $E_{b\&t}$  sections should be used, which are four lanes plus bikelanes and left-turn lanes or pockets as appropriate. The traffic carrying capacity of Street Section E is approximately 32,000 vehicles per day.

- (b) For conditions when a bikeway is to be located along an arterial, the right of way for Section B should be 67 feet, as described for a collector street; for Section E, 92 feet; and for Section F, 102 feet. The bikeway should be 8 feet wide and constructed on one side of the street, in lieu of the 6 foot sidewalk, as shown on Sections E4 and F4 on Figure 44-4.

- (b) The arterial streets sections are:

$D_b$  Minor Arterial Street with Bikelanes

$D_i$  Minor Arterial Street with Left Turn Pocket

$D_{b\&t}$  Minor Arterial Street with Bikelane and Continuous Left Turn Lane

$D_{b\&p}$  Minor Arterial Street with Bikelanes and Parking

$E_b$  Major Arterial Street with Bikelanes

Et Major Arterial Street with Continuous Left Turn Lane or Intersection with Left Turn Pocket

Eb&t Major Arterial Street with Bikelanes and Continuous Left Turn Lane

(3) MAJOR COLLECTOR STREETS

(a) These streets are intended to serve abutting lands and through traffic from within the neighborhood. The major collector street standard is to be used in lieu of the minor collector street when also serving commercial or industrial land uses. As shown in Figure 11-1, The "D" Sections are generally 40 to 48 foot roadways, curb face to curb face, within 64 to 66 foot rights of way. Five foot sidewalks should be provided on each side of the roadway adjacent to the edge of the right-of-way to provide a five to seven foot planting strip between the sidewalk and street.

(b) The 40 foot pavement width provides for two 12 foot travel lanes plus two four foot bike lanes for most Major Collector locations. Generally, curb parking will not be allowed unless the street immediately serves abutting residential uses for which alternative parking areas are not available. If parking is allowed on both sides of the street, the pavement width should be 48 feet to allow for two 12 foot travel lanes, two

four foot bikelanes, and two eight foot parking lanes with a total right of way width of 64 feet. It is also possible to stripe the roadway for two travel lanes, two bikelanes and left turn lanes at intersections or driveways by narrowing each lane in the intersection area, or, if it exists, removing curb parking. A Major Collector's traffic carrying capacity is approximately 10,000 per day.

- (c) If traffic volumes are forecast to be in excess of 5,000 vehicles per day, driveways serving newly constructed single family houses, duplexes or triplexes shall not be permitted on that section of street.

- (d) The Major Collector street sections are:

D<sub>b</sub> Major Collector Street with Bikelanes

D<sub>i</sub> Major Collector Street with Left Turn Pocket

D<sub>b&t</sub> Major Collector Street with Bikelane and Continuous Left Turn Lane

D<sub>b&p</sub> Major Collector Street with Bikelanes and Parking

#### (4) MINOR COLLECTOR STREETS

- (a) These streets are intended to serve the abutting land and carry through traffic from other parts of the neighborhood. As shown on Figure 11-1, the "C" sections generally are 40 to 48 foot roadways, curb face

to curb face, within a 60 to 68 foot right-of-way. A five-foot sidewalk should be located on each side of the roadway adjacent to the right-of-way line providing a five foot planting strip between the sidewalk and street. This street section provides for two travel lanes plus curb parking on both sides of the street. However, when parking occurs on both sides of the street, the effective travel lane width is reduced to 12 feet. The traffic carrying capacity of the residential collector is approximately 7,000 vehicles per day. If volume is forecast to be under 1,200 vehicles per day, it is not permissible to reduce the cross section to a local residential street standard when this street is performing a collector function.

- (b) If traffic volumes are forecast to be in excess of 5,000 vehicles per day, then driveways serving newly constructed single family homes, duplexes or tri-plexes shall not be permitted on that section of street.
- (c) When a bikeway is located along a Minor Collector street, an 8 foot wide bikeway shall be constructed on ~~a~~ side of the street in lieu of a 5 foot sidewalk the two bikelanes shall replace the parking lanes. On Minor Collectors, it is not necessary to stripe the bikelanes if "No Parking" and "Bikeroute" signs are used.

(d) The Minor Collector street sections are:

C<sub>b</sub> Minor Collector Street with Bikelanes

C<sub>p</sub> Minor Collector Street with Parking

C<sub>b&p</sub> Minor Collector Street with Bikelanes and Parking

(5) LOCAL RESIDENTIAL STREETS

(a) These streets are intended to serve the abutting land without carrying through traffic. These streets should be designed to carry less than 1,200 vehicles per day. If the forecast volume exceeds 1,200 vehicles per day, as determined in the design stage, the streets system configuration should either be changed to reduce the forecast volume or the street should be designed as a residential collector.

(b) The local residential street should be designed as a 32 foot roadway, curb face to curb face, within a 50 foot right-of-way, as shown in Street Section B on Figure 11-1. Five foot wide sidewalks should be provided on each side of the roadway and located adjacent to the right-of-way edge to permit a four foot planting strip between the sidewalk and street.

(c) The 32 foot cross section will accommodate passage of one lane of moving traffic in each direction with occasional curb parking. On low volume residential

streets where curb parking might occur frequently on both sides of the street, one lane of traffic will move freely. This condition has been found acceptable in residential areas where curb parking does not extend for great distances. The level of residential inconvenience occasioned by the lack of two moving lanes is remarkably low.

(6) CUL-DE-SAC STREETS

- (a) These streets are intended to serve the abutting land in residential areas. They should be less than 600 feet in length serving a maximum of 20 single family homes. The recommended street width is 28 32 feet, curb face to curb face within a 50 foot right-of-way, as shown on Figure 11-1 as Street Section B. For Cul-De-Sacs in residential areas, the right-of-way radius of the bulb shall be 50 feet with a curb radius of 40 feet. For commercial or industrial areas, the bulb shall have a right of way radius of 55 feet with a curb radius of 45 feet.

(7) BIKE FACILITIES

- (a) Planning for bicycle facilities is specifically part of the City's Parks Master Plan. However, this Transportation Plan sets design standards for bikelanes

when they are part of a street.

(b) For conditions when a bikeway is to be located along an Arterial or Major Collector, the bikeway should involve two, one-way bike lanes, one on each side of the street, with a minimum width of four feet and a desired width of five feet.

(c) On Minor Collectors it is not necessary to stripe the bikelanes as long as there is adequate signing.

(8) SIDEWALK LOCATION. It is the general policy of the City to place sidewalks at the property line. In areas where the placement of the sidewalk at the property line would result in the removal of significant trees, or the construction of significant fill or cut slope, or in other cases deemed appropriate by the City Engineer, the sidewalk may be meandered or placed adjacent to the curb. In Commercial and Industrial Planning Districts, all sidewalks shall be placed at the curb side.

(9) INTERSECTION AND DRIVEWAY SIGHT DISTANCES

(a) Intersections and driveways should be located and designed so that the motorist approaching the main street from the driveway or cross street has adequate sight distance to the right and left before proceeding into the main street. The sight distance requirements

should be determined by the City Engineer and measured from the motorist's position when the vehicle is in a stopped position ten feet behind the edge of pavement of the main street. The sight distance will vary depending upon the prevailing speed on the main street, the grade of the main street and whether the cross street or driveway is utilized by passenger vehicles or heavy duty vehicles with slow acceleration characteristics.

- (b) Adequate sight distance must also be provided for the traffic on the main street to see traffic entering or exiting the driveway or cross street and for motorists making left turns into the driveway or cross street. Adequate sight distance calculations vary by location and condition of the roadway and should be made utilizing procedures developed by the Institute of Transportation Engineers and the American Association of State Highway and Transportation Officials as well as the Oregon Department of Transportation.<sup>1</sup>

11.070 Truck Standards. Figure 11-3, the Transportation Plan Map, includes truck routes. These routes are to be used by any truck not making a local stop off the route. They

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<sup>1</sup> Guidelines for Driveway Design and Location, an Institute of Transportation Engineers recommended practice.

A Policy on Design of Urban Highways and Arterial Streets, American Association of State Highway and Transportation Officials, 1973

are designed to offer convenient routings while protecting residential areas. All intersections along truck routes shall be designed to accommodate a turning movement within the travel lane of a truck with a 50 foot wheelbase.

11.080 Street Plan. Traffic volume forecasts for the year 2000 "build out" were made on the basis of the expected population and employment for that time period as a result of development in accordance with the land use element of the Community Plan. These forecasts are shown on Figure 11-2 for the Tualatin street system. The recommended street plan is shown on Figure 11-3.

11.090 Arterial Streets. The following streets are planned to function as arterials within the City and will be designed, constructed, and maintained accordingly:

- Boones Ferry Road north of 88th Avenue
- Boones Ferry Road south of Tualatin-Sherwood Road.
- Boones Ferry Road
- Nyberg Street east of the Tualatin-Sherwood ~~extention~~ intersection including the I-5 interchange
- 65th Avenue
- Borland Road
- Tualatin-Sherwood Road
- Martinazzi Avenue between Boones Ferry Road and Sagert Street
- Lower Boones Ferry Road

- Tualatin Road
- Pacific Highway (99 W)
- Norwood/Cipole Expressway including the I-5 interchange

Each of these streets is described below with specific design plans.

(1) Boones Ferry Road.

- (a) North of Bridgeport Road, it is planned that Upper Boones Ferry Road function as a two lane arterial with left turn and bike lanes in accordance with Street Standard B4 D<sub>b</sub>&t.
- (b) Between Bridgeport and Lower Boones Ferry Road, it should be developed in a special section designed to accommodate two southbound lanes, one northbound lane and a continuous left turn lane. A signal will be required at the Upper Boones Ferry/Lower Boones Ferry intersection.
- (c) Between Lower Boones Ferry Road and Martinazzi, it should accommodate 2 lanes of traffic in each direction, plus left turn lanes in accordance with Standard Section E4. be developed into a special four-lane section, 48 feet wide within a 75 foot right-of-way. At Martinazzi, the right southbound lane should

become a right-turn lane into westbound Boones Ferry Road to align with the 3-lane section of Martinazzi Avenue between Boones Ferry Road and Nyberg Street. An 8 foot bikeway should be constructed within the right of way in lieu of a sidewalk on the west side of the street. A signal will be needed at Martinazzi.

(d) Between Martinazzi Avenue and Tualatin-Sherwood Road, on the north and west sides of downtown, it should accommodate two lanes of traffic and a continuous left turn lane in accordance with Street Standard D<sub>b&t</sub>. The intersections with Tualatin Road will need signalization.

(e) Boones Ferry Road south of Tualatin-Sherwood Road should be developed and preserved as a four lane arterial with continuous left turn and bike lanes in accordance with section B4 E<sub>b&t</sub> provided; however, that a 8 foot bikeway in lieu of a sidewalk shall be constructed on each side of the street. Signals will be needed at Sagert, Avery, Ibach and Norwood.

(2) Nyberg Street Including the I-5 Interchange.

(a) Nyberg Street serves as a major arterial between Tualatin-Sherwood Road on the west and 65th Avenue on the east, providing the major access point to I-5 from within the city. Between Tualatin-Sherwood and I-5, it

should be developed to accommodate 2 westbound through lanes, a westbound right turn lane, and a westbound left turn lane, as shown in the urban renewal Plan. In the eastbound direction, it should accommodate 22 travel lanes with a rightturn lane onto the southbound I-5 on-ramp. the street is a four lane arterial with left turn lanes. East of I-5 to 65th, the street has a special section with varying widths. This is described in (c), below.

- (b) The bridge over the freeway should accommodate two travel lanes in each direction. At the east end of the bridge, a loop ramp to accommodate the eastbound to northbound traffic should be developed as shown on figure 11-3. This loop ramp will be necessary because of the forecast heavy left turn demand which would require a double left turn lane. However, the existing bridge is not wide enough to accommodate four travel lanes plus a double left turn lane, making the loop necessary. Also necessary will be a free right turn onto westbound Nyberg from southbound I-5 in order to more effectively accommodate heavy travel movements to the employment centers.

- (c) East of I-5, Nyberg Street should be developed as a 66 foot wide four lane road within an 80 foot right-of-way. The intersection between Nyberg Street and 65th Avenue is under design to be developed as a curved

roadway to accommodate a 35 mile per hour operating speed. At this point it will be reduced in width from 66 feet to 44 feet within a 60 foot right-of-way. The specifics of this design have been agreed to by the City, the Oregon State Highway Division, and Washington and Clackamas Counties.

(3) 65th Avenue

- (a) This street serves as part of the main traffic corridor from the eastern Tualatin residential areas to downtown and the freeway, and also provides the link to the Meridian Park Hospital for the entire region. It is unique in that there is little demand for access in its central portion due to the floodplain. The street standard for 65th is D<sub>b</sub> except for major intersections such as at the Hospital where the improvement will be D<sub>i</sub>.

(4) Borland Road

- (a) Borland forms the final link in the Nyberg/65th/Borland route serving the eastern portion of the City. Borland serves to provide access to the hospital, Bridgeport Elementary School and other lands to the east outside the city. It is to be built generally to Street Standards D<sub>b</sub> and D<sub>i</sub>, however a special section will be used in the heavily wooded area east of the hospital in

order to minimize tree cutting and to incorporate the mature fir trees into the planting strips or a median strip wherever possible. The design for this area will be approved by the City Engineer as to its conformance with this intention.

(5) Tualatin-Sherwood Road

- (a) This street is the main avenue for east/west traffic through the city, and serves as a primary employee travel and truck route between the western industrial area and I-5. The four lane street, with left turn pockets at all intersections, that exists between Nyberg Street and 89th Avenue should be extended to Cipole Road. The actual design between 89th Avenue and the intersection with Nyberg Street has been adopted in the Urban Renewal Plan. The Oregon Department of Transportation is currently developing an Environmental Impact Statement for the construction of that section of roadway. An 8 foot bikeway should be constructed on the north side of Tualatin-Sherwood Road between Boones Ferry Road and Martinazzi Avenue in lieu of the 6 foot sidewalk, but within the 400 foot right of way. West of Tetan Avenue, the traffic volume is forecast to be less than 40,000 vehicles per day. Therefore, a 2 lane section with left turn lanes can be used in accordance with Street Standard B4. Street Standard B4 should be

used to provide an 8 foot bikeway on the south side of the roadway in lieu of a sidewalk. Section E<sub>b</sub> with bike lanes, is planned for this arterial route. The intersections with Teton, Cipole, and the new 124th Avenue collector will need to be signalized with Street Standard E<sub>t</sub> being used.

(4) Martinazzi Avenue

- (a) Martinazzi serves as an arterial street between Boones Ferry Road at the north end of downtown and Sagert Street at the south. This section of roadway will also utilize has been built to a special design as it was developed as part of the Urban Renewal Plan and as part of a planned unit development north of Sagert Street.
- (b) Between Nyberg Street and Boones Ferry Road, through the downtown area, the street will continue to have two travel lanes and a continuous left turn lane within the existing 44 foot roadway; except at Boones Ferry Road, where it will be realigned to form a continuous roadway with Boones Ferry Road to the north. It will continue to intersect with Boones Ferry Road at a "T" intersection however a traffic signal will be warrented in the near future.
- (c) There has been discussion of realigning Martinazzi so that it forms the through route, rather than Boones

Ferry, for traffic coming from the north. The traffic analysis that is part of the current update of the Urban Renewal Plan indicates, however, that this change should not take place as it would place an excessive amount of traffic on the street and effectively divide the downtown into two areas with difficult access between the portions.

(d) South of Nyberg Street, it should vary in width from 3 travel lanes at Nyberg Street to 4 lanes at Tualatin-Sherwood Road; plus left turn lanes as depicted in the Urban Renewal Plan. Between Nyberg Street and Tualatin-Sherwood Road, Martinazzi has been improved in accordance with the Urban Renewal Plan, incorporating multiple travel and turn lanes.

(e) Between Nyberg Street and Sagert Street, it should be developed as a 4 lane roadway; with left turn lanes at the intersections and major driveways. The right of way should be developed wide enough to permit an 8 foot wide bikeway on the west side of the street in lieu of a sidewalk. South of Sagert Street it will function as a collector street. To the south, between Tualatin-Sherwood Road and Sagert Street, Martinazzi should have two travel lanes in each direction with left turn lanes at major intersections. Much of this street was recently improved using a special section involving a

median strip between separated travel lanes. However the lanes were not made wide enough to support two lanes of traffic in each direction. Nor were any provisions made for bicycles. This area of the street will have to be widened in order to accommodate the projected flow of both automobile and bicycle traffic. In addition, by build-out a signal will be warranted at Sagert Street.

(5) Bridgeport Road

- (a) Bridgeport will function as an arterial roadway carrying traffic between Upper Boones Ferry Road and the I-5/Lower Boones Ferry Road Interchange. It is the intent of this Plan to encourage drivers traveling to downtown Tualatin to use Lower Boones Ferry Road. Therefore, Bridgeport is de-emphasized in order to keep its traffic volumes relatively low by creating much larger improvements on Lower Boones Ferry Road and by designating that road as the truck route. The amount of traffic Bridgeport Road will carry is uncertain at this time and depends primarily on the future design and signing of the intersections located at 72nd Avenue and Upper Boones Ferry Road and on the ability to encourage drivers to use Lower Boones Ferry Road to travel to downtown Tualatin rather than Bridgeport Road. Bridgeport Road should be developed as a 2 lane roadway with left turns at the intersections in

accordance with Street Standard B. However, Bridgeport will still carry a significant volume and warrants D<sub>b</sub> and D<sub>i</sub> section improvements. Signals should be installed at Lower Boones Ferry, McEwan Street, and both sets of I-5 interchange ramps.

(6) Lower Boones Ferry Road

- (a) This street functions as a major arterial. The year 2000 traffic volume is forecast to be approximately 43,888 12,000 vehicles per day. If additional traffic can be diverted from Bridgeport Road, then this volume may increase substantially and lower the estimated year 2000 traffic volumes on Bridgeport Road and Upper Boones Ferry Road. Consequently, the right of way width for this section of roadway should be in accordance with Street Standard E4, and the roadway should be designed as a 2 lane roadway with left turn lanes in accordance with Street Standard B4. Street Standard B4 will permit the development of an 8 foot wide bikeway in lieu of a 5 foot sidewalk on one side of the street. The street should be constructed to street standards E<sub>b</sub> and E<sub>i</sub>, with a four lane improvement, bikelanes, and turn pockets at intersections. This may happen in phases as development occurs.

(7) Tualatin Road

(a) Tualatin Road serves as a major connector between the downtown area and a variety of land uses, and at its western terminus with the Pacific Highway. Its use as a major arterial is de-emphasized in order to protect the extensive residential uses on its north side and the potential high technology industrial uses to the south. To this end it is not being designated a truck route and there is no plan to straighten the curves at its eastern end. However, a substantial amount of automobile traffic will use this route necessitating an improvement at some point in the future.

(b) Street Section D<sub>b</sub> will be used for most of the street, with D<sub>i</sub> being used at major intersections. In the area east of 115th Avenue there is a stand of mature firs along the southern line of the street. A special standard should be used in this area so that these trees can be saved. The street should be designed so that the trees are placed in a center median. This means that substantial right-of-way acquisition must come from the south. However, this is a single very large property that will probably develop as one piece. The necessary right-of-way can be acquired as part of the development review process.

(c) The intersection of Tualatin Road with Pacific Highway (99W)

will demand substantial redesign to handle the projected traffic flows. This redesign will be even more important due to projected traffic from the proposed 124th Avenue collector. This collector will intersect directly with Tualatin Road and the highway at the same corner.

(d) This intersection area will be redesigned with the following major elements:

1. Tualatin Road will be turned south across the northwest corner of the Leveton property to a point approximately 400 feet south of its existing location. It will continue on to the east to Cipole Road serving as a frontage road for the industrial uses in this area.
2. The proposed 124th Avenue will intersect Tualatin Road at the point approximately 400 feet south of its existing alignment. A traffic signal will be required. It will then move on northwest to form a 90 degree intersection with Pacific Highway.
3. The intersection with Pacific Highway will either be signalized or be constructed as an interchange.

(e) These improvements will allow for the safe merging of

traffic from both 124th Avenue and Tualatin Road and the feeding of this traffic efficiently on and off Pacific Highway.

(8) Pacific Highway

(a) Pacific Highway, (99W), functions as a major arterial road through Washington County. It is a four-lane divided roadway with left turn lanes. southwest of Tigard Through Tualatin, however, it is built to rural standards with gravel sholders and drainage ditches. It should remain as a divided, 4 lane roadway with left turn lanes, but eventually be developed to urban standards, with curb and gutter and sidewalks As development occurs, it should be redeveloped as an Urban Expressway in accordance with Street Standard F. This will include the addition of sidewalks and planting areas. Signals will be included in the major intersections at Cipole Road and Tualatin Road unless it is determined at the time of development that full interchanges are warrented.

(b) Partial control of access along Pacific Highway should be achieved to limit driveways and maintain a high capacity. Access control on the highway is very important if it is to efficiently and safely serve as a major transportation corridor. With much more

extensive development of the properties abutting the Highway, the potential for serious traffic conflicts greatly increases. Effective access control is mandatory if the Highway is to remain safe and viable. The Collector section of this plan element will discuss in detail planned frontage roads on both sides of the Highway. These roads will manage traffic so that it can safely and quickly leave or enter the Highway at two well designed intersections. This action will enhance the function of the Highway and will also increase the viability of industrial use on both sides of the route.

(9) Norwood/Cipole Expressway

- (a) This plan clearly identifies the need for the creation of a new freeway interchange and better access to the industrial areas. The traffic projections indicate that at "build-out," the Tualatin/Sherwood interchange on I-5 will be at 34,000 vehicle trips per day, which is its capacity, and there will still be a demand for approximately 23,000 additional trips into the City. The majority of these trips will be employee and truck traffic moving between the freeway and the western industrial area. Improvements to the existing interchange and to Nyberg Street and Tualatin-Sherwood Road to handle this traffic are impractical due to the availability

of right of way and the desire to disperse rather than concentrate this traffic in one area.

(b) Without the new route being completed by the time the industrial area is built out, the traffic congestion on Tualatin-Sherwood Road, Avery, Boones Ferry, and Martinazzi will be far below level of service "D" which means that there will be substantial delays in movement and probably a high level of infiltration of through traffic on residential streets.

(c) In the 1978 Tualatin Public Facilities Plan, the existing crossing of Norwood Road over I-5 was identified as a logical and desirable location for a new freeway interchange. This plan update concurs with that conclusion. The interchange will connect with a new expressway system, built at Street Standard F, that follows the Norwood right of way to the west and then moves further west either to connect with Helenius Road or Tonquin Road and along the selected alignment until the Burlington Northern Railroad tracks are crossed. From there the Expressway turns northwest and will skirt the west side of Tigard Sand and Gravel until it connects with the existing Cipole alignment at Tualatin-Sherwood Road. This alignment will be followed, with necessary straightening in the Herman Road

intersection area, until the Expressway reaches Pacific Highway where a major intersection or interchange will be built. This alignment can be seen on the Transportation Plan Map, Figure 11-3.

(d) The Expressway can be built in phases involving both extensions of the road in increments from the interchange west, and acquiring the eventual 100 foot right of way but only building one two lane section initially.

(e) The Norwood/Cipole Expressway offers the following advantages to the City:

1. It greatly enhances the development potential for the Western Industrial Area by providing fast and safe employee and truck access directly to the area.
2. It substantially reduces trip demands on the arterials leading to the downtown and within the downtown itself, helping to enhance the character of the area as envisioned within the Urban Renewal Plan.
3. It reduces the demand for additional improvements to the Tualatin/Sherwood interchange beyond those indicated in this plan.

11.100 Collector Streets. The following streets are planned to function as collector streets within the city:

- 65th Avenue south of Borland Road
- Borland Road east of Bridgeport Elementary School
- Nyberg Lane and 50th Avenue (Orchard Hill Road)
- 65th Avenue, 63rd Avenue and Rosewood Street north of Lower Boones Ferry Road
- McEwan Road
- Sagert Street
- Martinazzi Avenue south of Sagert Street
- Avery Street west of Boones Ferry Road.
- Grahms Ferry Road
- 105th/108th south of Avery Street
- Ibach Street
- Teton Avenue
- 108th Avenue
- 124th Avenue
- Herman Road
- Eipele Road
- 116th Avenue/Hazelbrook Road/Jurgens Road
- Tualatin Road
- Pacific Drive
- Pacific Highway South Frontage Road

- Boones Ferry Road between Tualatin Road and Martinazzi Avenue
- Nyberg Street between Tualatin-Sherwood Road and Boones Ferry Road
- Tonka/Warm Springs/Downtown Loop Street

Each of these streets is described below:

- (1) 65TH AVENUE south of Nyberg Street between Borland Road and I-205 functions as a collector street. However, because it serves the high density residential and hospital, the forecast traffic volume is higher than a typical collector street. It is planned as a 44 foot wide roadway within a 60 foot right of way to accommodate two travel lanes and left-turn lanes. An eight foot bikeway is proposed along 65th Avenue between the bridge over the creek and Sagert Street in lieu of a sidewalk. The street serves the future residential developments south of Sagert and the agricultural and rural residential land south of I-205 which is outside of the urban growth boundary. It will be constructed to Street Standard C<sub>b</sub>.
- (2) BORLAND ROAD east of Bridgeport Elementary School is an east/west collector street functioning between 65th Avenue in Tualatin to Bridgeport Elementary School and Stafford Road immediately south of Lake Oswego. It serves the rural residential lands east of the City. It should be developed

as a two lane roadway in accordance with Street Standard E4 C<sub>b</sub>. It should also be realigned at 65th Avenue to form one intersection with 65th Avenue and Sagert Street as shown on Figure 3. This realignment is necessary to direct traffic to and from the downtown and west via Sagert Street rather than Nyberg Street which is expected to operate at capacity in the vicinity of I-5 by the Year 2000. The intersection at 50th Avenue (SW Orchard Hill Road) should be redesigned to allow 50th to intersect at a 90 degree angle and provide adequate sight distance on both streets.

(3) NYBERG LANE AND 50TH AVENUE (ORCHARD HEIGHTS ROAD) form a collector connection between Nyberg Street and Borland Road serving the far eastern portions of the planning area. As development occurs these streets should be constructed to Street Standard C<sub>b</sub>.

(4) SW 65TH AVENUE, 63RD AVENUE AND ROSEWOOD STREET, north of Lower Boones Ferry Road serve an area planned for additional commercial and industrial development. These streets should be improved to form a loop in the area between I-5, the Southern Pacific Railroad, and Lower Boones Ferry Road. To accommodate existing and future industrial traffic, these streets should be developed with a continuous left turn lane according to Street Standard B D<sub>i</sub>.

(5) MC EWAN ROAD is planned to function as a collector street

from Lower Boones Ferry Road to 65th Avenue. It should be constructed in accordance with Street Standard B D<sub>b</sub>.

- (6) SAGERT STREET functions as a collector street from 93rd Avenue on the west side of the freeway to 65th Avenue on the east side. It is being developed as a two lane roadway with left turn lanes at intersections. Between Boones Ferry Road and 65th Avenue it is to be developed in accordance with Street Standard B4 D<sub>b</sub> to accommodate bikeways. West of Boones Ferry Road it should be developed as Street Standard E C<sub>b</sub>, as it serves only a residential neighborhood. It is recommended that west of 93rd Avenue, Sagert Street be ended with a cul-de-sac so as not to serve the industrial land to the west. In this manner, Sagert Street would function as a residential collector street west of Boones Ferry Road.

- (7) MARTINAZZI AVENUE south of Sagert Street functions as a collector. Its forecast traffic volume is expected to range from 6,888 3,000 vehicles per day at the south to 10,000 vehicles per day at Sagert. It is developed as a two lane roadway with left turns at major intersections in accordance with Street Standard E and E4 as shown on Figure 3 C<sub>b</sub>.

- (8) AVERY STREET west of Boones Ferry Road is planned to function as a collector street to Tualatin-Sherwood Road. It passes through both residential and industrial lands. The traffic projections indicate that the volume of vehicle

trips on Avery can be maintained at less than 10,000 per day if specific actions are taken to limit both truck and car traffic. To reduce the impact of truck traffic on the residential neighborhood, truck movements should be prohibited east of approximately 97th Avenue except to serve abutting property. In order to lessen the trip demand for residential traffic, the priority for traffic improvements should go to specific projects that will encourage traffic to continue moving north on Teton to Tualatin-Sherwood Road and from there to downtown, rather than migrating east on Avery to Boones Ferry Road. This primarily will involve giving high priority to the proposed Teton/Tualatin-Sherwood traffic signal, and not installing a Avery/Boones Ferry signal. Avery Street should be developed as a two lane roadway with left turn pockets and bikelanes between Boones Ferry Road and Tualatin-Sherwood Road in accordance with Street Standard B4 D<sub>b</sub> and D<sub>i</sub>.

- (9) GRAHMS FERRY ROAD is a collector street between Ibach Road and Wilsonville Road west of Wilsonville. It should be developed in accordance with Street Standard E C<sub>b</sub> as the surrounding urban area is developed. The intersection of Grahms Ferry and Ibach should be reconstructed so that the streets intersect at a 90 degree angle with turn lanes.

- (10) 105TH AND 108TH are planned to function as a single collector street corridor between Avery Street and Norwood Road. North of Ibach Street it should be developed in

accordance with Street Standard B D<sub>b</sub> and D<sub>i</sub> because of the industrial development on the west side of that section of roadway. South of Ibach Street, it should be developed as Street Standard E C<sub>b</sub>.

(11) IBACH ROAD serves as an east/west collector between 108th Avenue and Martinazzi Avenue. An extension of the street through a corridor south of Byrom Elementary School to the future extension of Martinazzi will be necessary as development occurs. The entire street should be developed to Street Standard C<sub>b</sub>.

(12) TETON AVENUE is a north/south industrial collector running between Tualatin Road and Avery Street. It is fully improved to and should be maintained according to Street Standard D<sub>i</sub>. It is proposed that one continuous collector street be developed between Tualatin Road and Avery Street utilizing 402nd and 404th Avenues, as shown on Figure 3. This collector street is intended to form a north-south connection across the two lane industrial collector street with left turn lanes in accordance with Street Standard B. The intersection between 404th Avenue and Tualatin Road should be realigned as shown on figure 3 to direct through traffic between Tualatin Road and 404th Avenue.

(13) 108TH AVENUE is an existing north/south street running between Tualatin Road and Herman Road. It serves a

collector function and should be developed according to Street Standard D<sub>i</sub>.

- (14) 124TH AVENUE is a proposed industrial collector that will serve to connect Tualatin Road and Tualatin-Sherwood Road in the western portion of the industrial area. The corridor that it will follow generally moves north from Tualatin-Sherwood Road on an unimproved right of way that is on the section line between Sections 2S1 27 and 2S1 28. It follows this general alignment to the southwest corner of the Leveton property. At this point it will move north along the boundary of the property until it intersects the realigned Tualatin Road/Pacific Highway intersection. This collector should be built to Street Standards D<sub>b</sub> and D<sub>i</sub>.

- (15) HERMAN ROAD is an industrial collector street throughout its length between Tualatin and Cipole Roads. It should, therefore, be developed as Street Standard B D<sub>b</sub> and D<sub>i</sub>, with the following modifications: For that portion of the road that runs parallel to and adjacent the Southern Pacific Railroad tracks, the seven foot planter strip and five foot sidewalk should be eliminated from the southerly side of the road, resulting in a reduction of total right of way from 64 feet to 54 feet. The foregoing modification applies only to the following described portion of S.W. Herman Road: the southerly right of way line of SW Herman Road, also known as County Road No. 489, Washington County, Oregon, beginning at the eastern most corner of Tax Lot 400, Map 2S1 21D; and

thence northeasterly for a distance of 9,375 feet, more or less, to the northeasterly corner of Tax Lot 1203, Map 2S1 23B. The intersection with Tualatin Road should be realigned with Cheyenne Way as shown on Figure 11-3 to reduce the existing accident potential.

(16) HAZELBROOK ROAD is a residential collector street east of Pacific Highway. It should ultimately be constructed in accordance with Street Standard C. 116TH AVENUE, HAZELBROOK ROAD, AND JURGENS ROAD form a collector street loop that serves the residential area between Tualatin Road and the Tualatin River. They should be constructed to Street Standard C<sub>b</sub> as development occurs.

(17) PACIFIC DRIVE is a proposed collector serving as a frontage road for the newly developing higher density residential area between Pacific Highway and the Tualatin River. It exists for a portion of its proposed length at this time and should be extended as far north as practical within the residential districts. This street is intended to provide safe and convenient access to the properties fronting on Highway 99W while minimizing congestion and hazards on the highway. It will be built immediately adjacent to the highway improvement according to Street Standard C<sub>b</sub>, however the standard is be modified so that no sidewalk and planting strip are required on the south side next to the highway.

- (18) PACIFIC HIGHWAY SOUTH FRONTAGE ROAD is a proposed collector serving as a frontage road for the newly developing higher intensity industrial area south of Pacific Highway. It is intended to be an extension of Tualatin Road extending west from the new Tualatin Road/124th Avenue intersection. This street is intended to provide safe and convenient access to the properties fronting on Highway 99W while minimizing congestion and hazards on the highway. It will be built immediately adjacent to the highway improvement according to Street Standard D<sub>B</sub>, however the standard is be modified so that no sidewalk and planting strip are required on the north side next to the highway.
- (19) NYBERG STREET west of Tualatin-Sherwood Road is planned to function as a downtown collector street. It is planned in the Urban Renewal Plan to be developed into a special section vaying in width and direction of operation. Immediately west of the interseection with the Tualatin-Sherwood extension, it is to be a 24 foot wide, one-way westbound street entering downtown. Between Martinazzi and approximately 450 feet to the east, it should contain an eastbound lane to serve the shopping center access point located there. The eastbound and westbound lanes could be separated by a landscaped median. The street has been redeveloped as part of the Urban Renewal Plan with special sections designed to handle traffic moving from the arterials into downtown.

(20) TONKA/WARM SPRINGS/DOWNTOWN LOOP STREET is a proposed collector street that will ring the downtown area. This collector will greatly enhance access to the commercial uses and will improve access to many areas. It will also help define the southern boundary of the downtown. It begins on the south with the existing Tonka Street and Warm Springs Street which will be designated as a one way couplet. They will be joined and move to the southeast, crossing Martinazzi between the south Fred Meyer property line and Nyberg Creek. The new street will move east to the freeway where it will turn north. After going under Nyberg Street in a tunnel near the interchange ramps, the street will join with the existing private street that serves the commercial uses between K-Mart and the freeway. At the northern edge of the K-Mart property the street will turn west, moving along the north K-Mart property line until a new intersection with Boones Ferry Road is reached. This entire street will be a special section, but will generally follow Street Section C<sub>b</sub> and modified as specific areas warrent.

(21) NEW STREETS

(a) Collector streets are proposed between the wetlands and Tualatin Road, as shown on Figure 44-3. The exact location of these roads should be determined when the Wetlands Study of this area is completed and in

conjunction with the property owners.

- (b) A new street at approximately 97th Avenue is proposed north of Avery Street to serve that industrial area without impacting the adjacent residential area. This new road is necessary since Sagert Street will be terminated in the residential area to the east.

Minor Collectors will be required throughout the planning area to carry traffic to the Major Collectors and Arterials. The Transportation Plan Map (Figure 11-3) shows the general locations for which such new streets should be planned. Specific locations are not defined at this time and are left to be determined on a case by case basis as development occurs. Generally, these streets should be built to Street Standard D<sub>b</sub>.

#### 11.110 Traffic Signals.

- (1) The locations of future traffic signal installations are shown on Figure 11-3. These signals should be installed as traffic volumes require in the future. Generally when traffic on the main street approaches 7,500 to 8,000 vehicles per day, and 4,000 vehicles per day on the minor street, a traffic signal may be necessary. However, in all cases, a traffic engineering analysis should be made to determine the proper traffic control at that time.

- (2) Because of the close proximity of signals on Boones Ferry Road, Martinazzi Avenue and Nyberg Street, an interconnected signal system will be required for those signals south of Bridgeport Road and north of Avery Street.

#### 11.120 Truck Routes

- (1) The truck route plan is shown on Figure 11-3. This plan indicates that trucks would be routed in and out of Tualatin via I-5, Pacific Highway, 72nd Avenue, the Norwood/Cipole Expressway, and Tualatin-Sherwood Road. It is planned that through truck traffic would not be ~~directed through Tualatin~~ allowed on Boones Ferry Road, on Bridgeport Road, on Avery Street, or on Tualatin Road east of Teten Avenue.
- (2) To reduce the impact of truck traffic in neighborhoods which are not industrial or commercial, truck traffic shall be prohibited from using all other streets which are not on truck routes, except for direct local access to serve properties off the truck routes.

#### 11.130 Bikeways Plan ((EXISTING TEXT TOTALLY ELIMINATED))

The Tualatin Parks and Recreation Plan includes a study and plan for the City's bikeway system. This is generally a system that is based on bicycle lanes on each side of most arterial and collector streets so that bike traffic can move with automobile

traffic in a safe, efficient, and inviting manner.

11.140 Public Transportation

- (1) Public transportation service is provided by Tri-Met. It is proposed that this service be expanded to include local service radiating from the downtown, service connections to the adjacent cities such as Tigard, Beaverton, Washington Square, Lake Oswego, and Wilsonville, as well as express service to downtown Portland and other parts of the region.
- (2) It is the goal of Tualatin to be provided with public transportation service so that every citizen is within a two to three block walk of a bus line. In the event express bus service is provided on I-5, it is proposed that a transfer station be considered at the Norwood Road ~~overpass of I-5~~ I-5 interchange to serve the residential area at the south end of Tualatin. The State has also planned a Park and Ride Station at the North Tualatin Interchange across from the Kopper Kitchen restaurant. This will aid the citizens of the community in gaining express transit service to downtown Portland.
- (3) If light rail service is developed to Tualatin, it would in all probability utilize one of the existing railroad lines. A light rail station should be located as close to downtown as possible so that the local feeder bus service can serve both the station and downtown at the same time. A station

on Tualatin Road/Boones Ferry Road at about Seneca Street would be an ideal location, serving the downtown and the industrial area to the west at the same time. A second station might be located near the south end of the City in the vicinity of Ibach Street.

- (4) The City will transmit, upon request, its goals, policies and ideas to Tri-Met for its system planning, and work closely with Tri-Met in planning future service for the area.

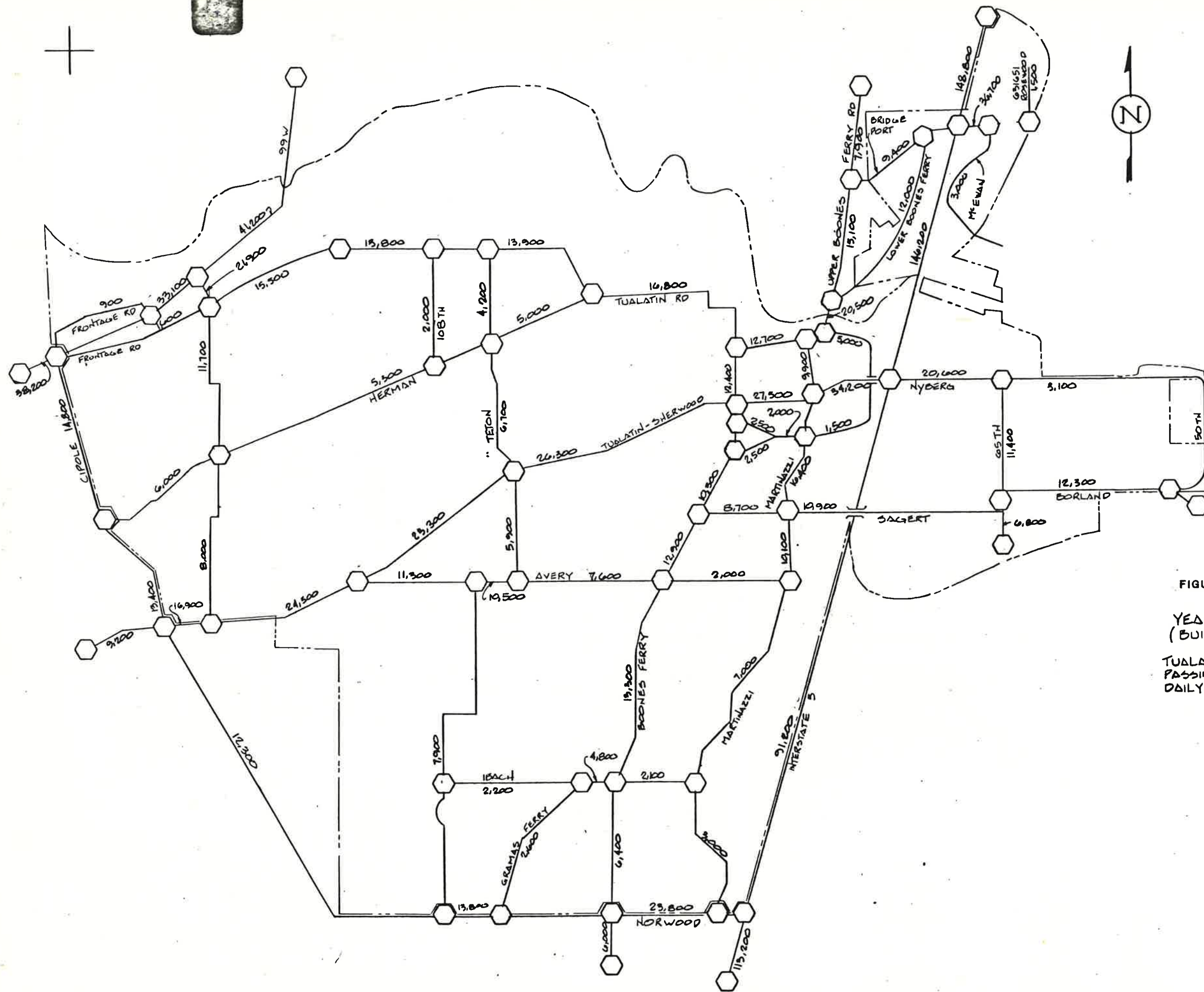


FIGURE 11-2

YEAR 2000  
(BUILD OUT)

TUALATIN PLUS  
PASSING AVERAGE  
DAILY TRAFFIC



CITY OF TUALATIN  
TUALATIN DEVELOPMENT CODE

PUBLIC FACILITIES PLAN -  
SEWER ELEMENT  
PLAN AMENDMENT

PA 83-5

PUBLIC HEARING DRAFT

MARCH 28, 1983

## INTRODUCTION

In 1979, the City of Tualatin prepared a comprehensive plan for development within the City. At that time, the firm of R. A. Wright Engineering prepared a sanitary sewer service element of that plan. In 1982, the City of Tualatin engaged in a major review and revision of the 1979 plan. This review and revision was necessitated by the annexation of approximately 1100 acres west of the city limits and the assumption of active planning in the planning area from Washington County. During this process, the City of Tualatin staff reviewed the sanitary sewer service element of the 1979 Comprehensive Plan. The remainder of this report reflects the modifications made by the City of Tualatin staff to the original R. A. Wright Engineering Report. The majority of these modifications were minor in nature due to more indepth detail being available on the future planning of the City's Urban Growth Boundary.

The City of Tualatin is part of the Unified Sewerage Agency (USA), and treatment of sewage waste is generally handled by USA's Durham treatment plant. Waste generated within the City limits north of the Tualatin River and east of I-5 is treated at Lake Oswego's treatment plant. Therefore, this report will not deal with treatment facilities, and it is assumed that the plan is in compliance with MSD's Areawide Waste Treatment Plan. However, it should be noted that Tualatin's projected growth exceeds the projections of the Lower Tualatin Facilities Plan; and, therefore, any expansion beyond the urban growth boundaries for the Year 2000 should be coordinated with USA.

The purpose of the sewer plan is to determine what existing lines need reinforcing, what new lines will be necessary to meet the requirements of an expanding community and to determine what costs and financing methods are entailed in implementing the proposed improvements.

The study area is the same as utilized for the Tualatin Community Land Use Plan.

The proposed sewerage collection system is sufficient to serve the area within the Year 2000 growth boundary at saturation densities. However, some areas may experience limited surcharging during periods of peak user and infiltration flow.

The work involved in this study is preliminary in nature and is intended solely as a guide to more serious undertakings with reference to the construction of the facilities. The cost estimates provided have been based on current construction and material costs with a reasonable allowance for contingencies.

## DESIGN CRITERIA

The design of the sewage collection system was based on the maximum load the system would be expected to receive. The load was composed of a combination of peak user flows and infiltration/inflow allowances. Existing point sources were also included but no attempt was made to project new industrial or commercial loads in excess of the values applied to all industrial and commercial lands. Consumer loads for individual lines were deter-

It is recommended that the waste flow generated in the area east of 105th Street and north of Ibach, currently served by the 105th Street Trunk, be rerouted to the future extension of the Bluff/Cipole Interceptor at S.W. Coquille Street and 105th Avenue.

#### COST ESTIMATES

Cost, including engineering and administration, estimates for the major improvements in Tualatin's sewage collection system are summarized in the Table below. No attempt has been made to adjust prices to a future date.

TABLE 1  
SEWER LINE IMPROVEMENT COST ESTIMATES

| <u>Location</u>                                                                  | <u>Size</u> | <u>Quantity</u> | <u>Cost</u>            |
|----------------------------------------------------------------------------------|-------------|-----------------|------------------------|
| Bluff/Cipole Int. between 104th and 110th Ave.                                   | 21"         | 1750'           | \$128,000              |
| 106th Ave Trunk, to Upper Tualatin Int.                                          | 8"          | 1550'           | \$106,000              |
| 110th Ave. Trunk, between, Tualatin Rd & Bluff Cipole Int.                       | 8"<br>12"   | 2220'<br>430'   | \$121,000<br>\$ 25,000 |
| Trunk, north of growth boundary between 110th and 124th Ave.                     | 10"<br>12"  | 2100'<br>1500'  | \$121,000<br>\$ 88,000 |
| 104th Ave trunk, between Tualatin Rd. & Bluff Cipole Int.                        | 8"          | 2650'           | \$167,000              |
| Upper Bluff/Cipole Int., between Bluff/Cipole and 105th Ave & Coquille           | 15"         | 7200'           | \$380,000              |
| Burlington Northern R/W, between Little Homes Rd and Upper Bluff Cipole Int.     | 8"          | 5100'           | \$200,000              |
| Bluff/Cipole Trunk, between SW Ibach & Bluff/Cipole Int                          | 10"         | 2750'           | \$158,000              |
| Graham Ferry Trunk, between Little Homes Rd. and Ibach St.                       | 8"          | 2600'           | \$160,000              |
| Ibach St. Trunk, between 108th Ave, & Graham Ferry                               | 8"          | 1440'           | \$100,000              |
| Ada St. Trunk, between 108th and Burlington Northern R/W                         | 8"          | 1200'           | \$ 82,000              |
| Avery Trunk, between Burlington Northern R/W and Bluff/Cipole Int.               | 8"          | 1250'           | \$ 86,000              |
| Sagert St. (ext. west), between Upper Bluff/Cipole Int. and Tualatin Sherwood Rd | 8"          | 1250'           | \$ 68,000              |
| Ibach St. Trunk, between Boones Ferry Rd and Mandan Ct. sewer                    | 10"         | 1850'           | \$106,000              |
| Ibach St. Trunk, between 99th Ave (ext.) and Boones Ferry Rd.                    | 8"          | 1350'           | \$ 93,000              |

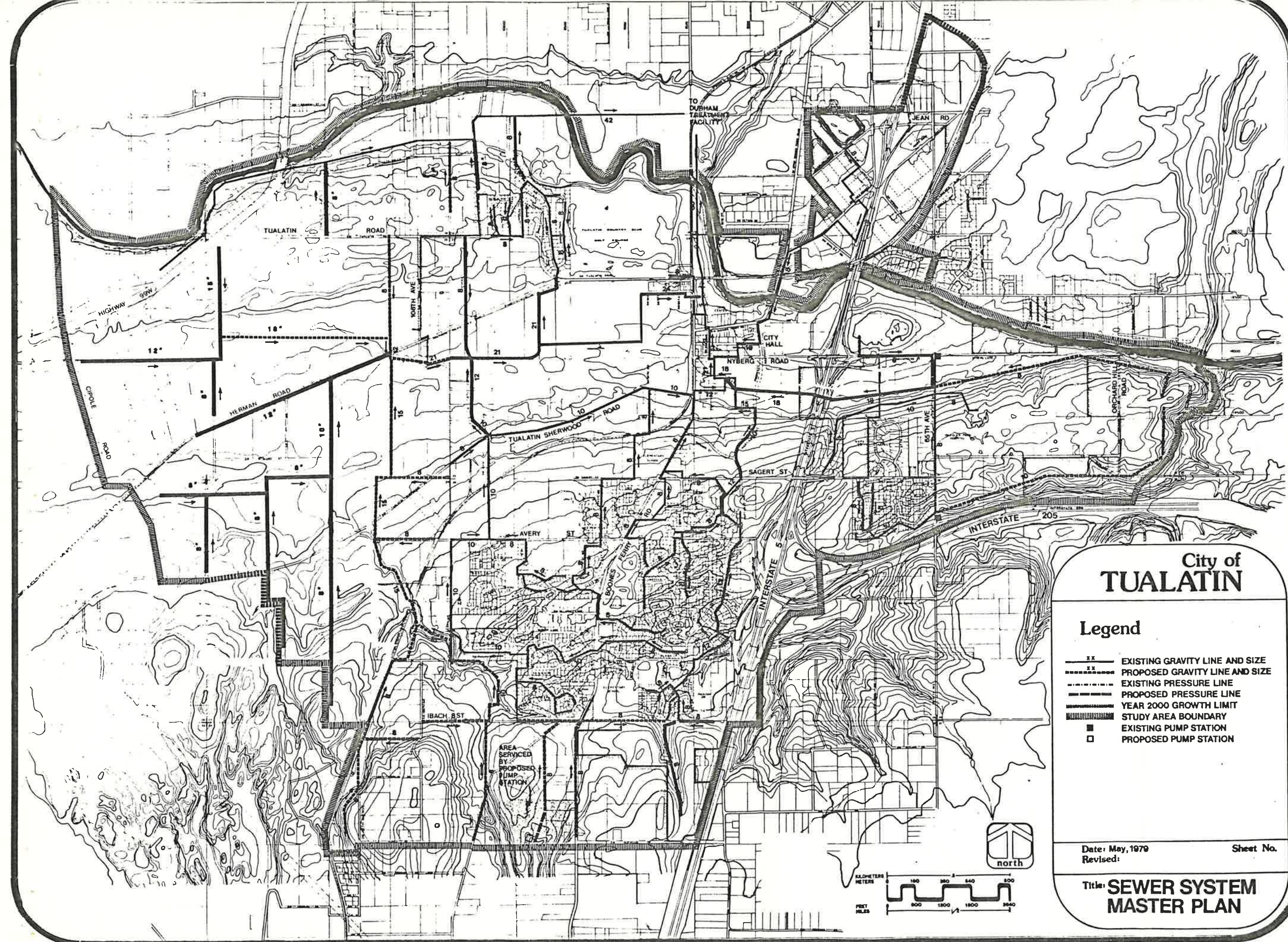
TABLE 1 (Cont.)

| <u>Location</u>                                                                  | <u>Size</u> | <u>Quantity</u> | <u>Cost</u> |
|----------------------------------------------------------------------------------|-------------|-----------------|-------------|
| Dakota Hills Dr. extended south of Ibach                                         | 8"          | 2300'           | \$126,000   |
| Boones Ferry Road, south of Ibach                                                | 8"          | 2550'           | \$175,000   |
| West of Boones Ferry, south of Ibach (Pressure Main & Pump Station not included) | 8"          | 2100'           | \$129,000   |
| Nyberg Trunk, east of SW 65th                                                    | 8"          | 5200'           | \$204,000   |
| Interstate 205, between Borland Rd & Orchard Hills Rd and SW 65th                | 10"         | 4150'           | \$174,000   |

TOTAL

## FINANCING METHODS

The financing for the improvements proposed in the previous section will continue to be provided primarily by local improvement districts, connection and service charges, and private investors for residential and commercial developments. Construction of interceptors and trunks will likely involve a combination of costs to developers, contributions from Tualatin's sewer fund, and assessments against properties benefited. There appears to be adequate funds available to the City from service and connection charges to provide a portion of the financing for major improvements to the sewer system. Increases in service fees and connection charges will likely be necessary as inflation cuts into the dollar's buying power.



## City of TUALATIN

### Legend

- EXISTING GRAVITY LINE AND SIZE
- - - - - PROPOSED GRAVITY LINE AND SIZE
- - - - - EXISTING PRESSURE LINE
- - - - - PROPOSED PRESSURE LINE
- - - - - YEAR 2000 GROWTH LIMIT
- ▬ STUDY AREA BOUNDARY
- EXISTING PUMP STATION
- PROPOSED PUMP STATION

Date: May, 1979  
Revised:

Sheet No.

Title: **SEWER SYSTEM  
MASTER PLAN**

CITY OF TUALATIN  
TUALATIN DEVELOPMENT CODE

PUBLIC FACILITIES PLAN -  
WATER ELEMENT  
PLAN AMENDMENT

PA 83-6

PUBLIC HEARING DRAFT

MARCH 28, 1983

## INTRODUCTION

The legal and practical requirements of land use planning for the City of Tualatin mandate public facility plans that compliment and provide for logical and orderly implementation of the community development goals and plan. R. A. WRIGHT ENGINEERING, INC. was contracted by the City of Tualatin to update the water service component of the overall development plan. In formulating the recommendations and conclusions described in the next section, the design criteria contained in Section 2 was applied to the existing system. With further analysis, a phased capital improvement program and cost estimate was developed as shown in Sections 4 and 5 respectively. Finally, financing alternatives were reviewed and recommendations made. The financing considerations are documented in Section 6.

Like most suburban communities in the Portland metropolitan area, the City of Tualatin is faced with a rapidly expanding population and a water system that requires improvements in order to meet future needs. The City of Tualatin is projecting a substantial growth in industrial land uses making the projection of future water demand more complicated and less reliable.

The purpose of the water service plan is to provide a basis for 1) reinforcement of the existing water system to provide adequate peak and fire flow capabilities, 2) expansion of the distribution system as outlying areas develop, 3) expansion of supply and storage facilities for present and future needs and 4) financing the construction of the foregoing facilities. The plan includes a schedule of capital improvements and a cost estimate from which annual budgets can be determined.

The study area is the same as utilized for the Tualatin Community Land Use Plan. The study area consists of approximately 5,000 gross acres.

The water system presented in this plan is sufficient to serve the area within the year 2000 growth boundary at saturation densities. The work involved in this study is preliminary in nature and is intended solely as a guide to more serious undertakings with reference to the construction of the facilities. The cost estimates provided have been based on current construction and material costs with a reasonable allowance for contingencies.

## DESIGN CRITERIA

The proposed water supply and distribution system is designed to accommodate the maximum demand that the system is expected to experience. The maximum demand is composed of a combination of consumer flows and fire flows. Examination of past water records revealed an average per capita water consumption which, when

applied to the population projections, resulted in estimated future water demand. Required fire flows vary as to the type of structure, its use and location.

#### POPULATION

Utilizing the land use plan, as shown in Chapter 9 of the Tualatin Community Plan and assumptions regarding densities, vacancy rates and availability of residential properties from the same source, population projections for the years 1985, 1990, 1995, and 2000 were developed. Table 1 and Figure 1 illustrate the projected growth for Tualatin.

TABLE 1  
PROJECTED GROWTH ASSUMPTIONS

| <u>Year</u> | <u>Growth Policy*<br/>Number</u> | <u>Market Trend*<br/>Number</u> | <u>Water Study<br/>Number</u> |
|-------------|----------------------------------|---------------------------------|-------------------------------|
| 1975        | 3,241                            | 3,241                           | 3,241                         |
| 1980        | 4,760                            | 6,390                           | 8,051                         |
| 1982        | ---                              | ---                             | 9,952                         |
| 1985        | 7,000                            | 10,990                          | 15,611                        |
| 1990        | 10,280                           | 16,270                          | 18,777                        |
| 1995        | 15,100                           | 22,615                          | 22,317                        |
| 2000        | 22,180                           | 28,721                          | 27,579                        |

\*From City of Tualatin Community Development Code, 1978 Edition  
(Note: Actual population in December, 1978, was 5,800).

#### Consumption

Examination of past water records revealed total annual consumption for 1974 to 1978, from which average daily per capita demand was determined. Table 2 illustrates the per capita demand experienced in the City of Tualatin from January, 1974, to December, 1978.

TABLE 2  
PER CAPITA DEMAND

| <u>Year</u> | <u>Population<br/>(July)</u> | <u>Consumption<br/>(MG)</u> | <u>Per Capita<br/>Demand (gpcd)</u> |
|-------------|------------------------------|-----------------------------|-------------------------------------|
| 1974        | 2,800                        | 152                         | 149                                 |
| 1975        | 3,241                        | 165                         | 140                                 |
| 1976        | 3,605                        | 184                         | 140                                 |
| 1977        | 4,725                        | 216                         | 125                                 |
| 1978        | 5,440                        | 230                         | 116                                 |

This data indicates a decline in per capita water consumption. However, an analysis of the availability of water over this time period indicates that this decline may have been involuntary. Therefore, 140 gallons per capita per day (gpcd) was selected as a representative average daily per capita demand, and it was assumed that this rate would remain constant in the future. An analysis of 1978 data indicated that the per capita consumption of residential customers was approximately 100 gpcd while commercial and industrial consumption averaged approximately 3,500 gallons per acre per day (gad) and 1,000 gad respectively. These figures, when applied with a peaking factor of three (3), were used to allocate maximum daily demand to various land uses throughout the City. Because only monthly readings were available for total flow, it was necessary to assume a peaking factor to determine maximum daily water demand. The ratio of maximum daily demand to average daily demand in the metropolitan area varies but is generally between two (2.0) and four (4.0). Elementary schools were assumed to have an average per student demand of 24 gallons per day. Table 3 summarizes the design flows used in this report.

TABLE 3  
DESIGN FLOWS

| <u>Land Use</u> | <u>Average Consumption</u> | <u>Maximum Consumption</u> |
|-----------------|----------------------------|----------------------------|
| Residential     | 100 gpcd                   | 300 gpcd                   |
| Commercial      | 3,500 gpad                 | 10,500 gpad                |
| Industrial      | 1,000 gpad                 | 3,000 gpad                 |
| Overall         | 140 gpcd                   | 420 gpcd                   |

Based on the projected growth of the City and the estimated per capita water consumption, the average and maximum daily water consumption for incremental periods to the year 2000 are shown in Table 4.

TABLE 4  
PROJECTED CONSUMPTION

| <u>Year</u> | <u>Population</u> | <u>Comm.<br/>Acreage</u> | <u>Ind.<br/>Acreage</u> | <u>Average<br/>Consumption<br/>MGD</u> | <u>Peak<br/>Consumption<br/>MGD</u> |
|-------------|-------------------|--------------------------|-------------------------|----------------------------------------|-------------------------------------|
| 1978        | 5,800             | 44                       | 58                      | .79                                    | 2.37                                |
| 1982        | 9,952             | 135                      | 345                     | 1.81                                   | 5.43                                |
| 1985        | 15,611            | 148                      | 460                     | 2.54                                   | 7.61                                |
| 1990        | 18,777            | 183                      | 505                     | 3.02                                   | 9.07                                |
| 1995        | 22,317            | 183                      | 575                     | 3.45                                   | 10.35                               |
| 2000        | 27,579            | 275                      | 675                     | 4.70                                   | 14.10                               |

#### Fire Flows

In addition to supplying domestic consumption at the maximum daily rate of demand, the water distribution system should be able to provide adequate fire flows. For a community of Tualatin's size it

is only necessary to provide for a single fire occurrence at any time. The distribution network was designed to provide fire flows of 1,500 gpm for single-family residential areas, 2,500 gpm for multi-family residential areas (two-story buildings where the first floor area is less than 15,000 square feet), and 4,000 gpm for industrial and commercial areas or apartments larger than the above described buildings. The system was designed for the required fire flows with a minimum of 20 psi residual pressure.

Other factors influencing the system's ability to supply fire fighting water include location and number of fire hydrants, size of distribution lines, looping of the distribution system and storage capacity as it relates to the required duration of fire flows. These factors have been integrated into the proposed network, and portions will be discussed further in subsequent sections of this report.

#### Method of Analysis

The existing and proposed water distribution systems were analyzed mathematically on a digital computer by the Newton-Ralphson method; Hazen Williams' coefficient "C" of 100 was used for all distribution lines within the system, and a "C" of 130 was used for main line transmission lines. Fire fighting demands were superimposed on maximum daily flows.

#### EXISTING SYSTEM

The City of Tualatin has entered into an agreement with the City of Portland to obtain water from the Bull Run watershed via the Washington County Water Supply Line. The City is presently installing a 36-inch water transmission line that will be completed in 1983. The line has sufficient capacity to provide the City with an adequate water supply beyond the year 2000.

The City's water system is composed of three pressure levels with one storage reservoir located in each level. There is a 2.4 million gallon reservoir located in both the lower and middle levels and an 0.8 million gallon reservoir in the upper level.

The reservoir for the lower pressure system is located near the intersection of 102nd Avenue and S. W. Killarney Lane at a ground elevation of 250 feet and a maximum water surface elevation of 300 feet. The middle level reservoir is located southwest of the S. W. Norwood Road overpass over Interstate 5 at a ground elevation of 350 feet and a maximum water surface elevation of 400 feet. The upper level reservoir is located east of Interstate 5 on S. W. 82nd approximately 4,000 feet south of Norwood Road at a ground elevation of 458 and a maximum water surface elevation of 507.

The City has three pump stations. Two stations pump from the lower level to the middle level. One of these stations is located on Boones Ferry Road just north of Tualatin Elementary School and

has two booster pumps with a combined capacity of about 700 gpm. The second station is located on Martinazzi Avenue south of Nyberg Road and has two pumps with a combined capacity of 2,200 gpm. The third station pumps from the middle level to the upper level and is located at the Norwood Reservoir site and consists of two pumps with a combined capacity of 1,200 gpm.

The water storage capacity of the City currently is adequate. The Oregon State Division of Health recommends that storage capacity be equal to three days average demand. The average daily demand for 1983 was approximately 1.0 million gallons (mg). Therefore, the storage requirement would equal 3.00 mg compared to the existing capacity of 5.6 mg.

#### PROPOSED IMPROVEMENTS

The proposed water distribution and storage system for the year 2000 is illustrated in Figure 2. The phased construction of this system will be dictated by actual growth patterns. Growth over the next three years can be projected with reasonable accuracy; and, therefore, the capital improvement program from 1983 to 1985 is somewhat more detailed. Development after 1986 should reflect actual growth patterns yet remain consistent with the overall development of the system.

#### Source of Supply

As mentioned previously, the City of Tualatin has entered into an agreement with the City of Portland to supply Bull Run water. Upon completion of the necessary transmission lines which are presently under construction, the City will have adequate supply and water pressure to service the City's needs until the year 2000.

#### Pressure Zones

The City of Tualatin has three pressure zones which are designated as A, B, and C on Figure 2.

Pressure Zone A includes the northerly portion of the study area covering elevations from 110 feet to about 200 feet. Pressure Zone B includes the central portion of the study area with elevations

from about 180 feet to 300 feet. Pressure Zone C covers the southerly portion of the study area from elevation 280 to elevation 360.

Substantial development exists and continue to occur in Zones A and B and development of Zone C is expected to begin with a few months. Improvements to the water system have been categorized by priorities based on projected development. Projects needed by 1986 are listed in Table 5 in the next section under Phase I while those needed between 1987 and 2000 are listed under Phase II. The improvements are also shown on Figure 2.

#### Service Level A

The immediate concern in the lower pressure zone is the installation of the 18-inch transmission line in Tualatin Road from the City Park to S.W. 108th. The subject line is necessary to supply adequate flow and pressure to the industrial area on the west side of the City.

By 1984, improvements to the existing distribution system of the lower pressure zone need to be completed to handle the total peak demand of the system and potential fire flow. These improvements include replacing some existing lines with larger pipe and construction of several new large distribution lines. Other scattered improvements to the distribution network are also recommended but are generally related to specific developments rather than to the system as a whole.

Previous plans for the Tualatin Water System called for additional reservoir capacity on the Service Level A system. These plans presumed that Tualatin would continue to purchase water from a low pressure source such as the City of Lake Oswego or the Tigard Water District. The new connection to the City of Portland system, however, will provide water at a pressure level that will be high enough to serve Service Level B without pumping under most operating conditions. This will mean that all water entering the Tualatin system will enter at approximately the Level B pressure level and then will flow into the Level A system through pressure reducing valves or will be pumped into the higher Level C system. Since the Tualatin system will have several points of connection between the A and B systems, there will, in case of emergency, be ample opportunity to transfer water stored in the Level B system down to the Level A system.

Since the transfer of water from A level to B level would require pumping, water stored in the Level A system is only marginally of benefit to the Level B system. It, therefore, is logical to provide the storage requirements of both Level A and Level B within the Level B system. This will also minimize the problem of water circulation that occurs when water is supplied to a system above the operating pressure of its reservoirs. Under this condition control valves close and isolate the reservoir from the operating system, thereby restricting or eliminating water circulation in the reservoir.

transmission line to the Level B system, the transmission line should be extended on Boones Ferry Road as far south as Sagert Road in the near future. This extension will both improve the distribution of flow in the Level B system and will supply the Level B system without pumping. This need not be done immediately, but the sooner this part of the plan can be implemented, the sooner the City can realize a reduction in pumping costs.

In the future the transmission line will have to be extended farther south along Boones Ferry Road into the B level system. This will be necessary to improve the B system piping network. Without such an extension users in the lower north end of the B system will experience excessively high pressures while those in the higher land to the south will have lower water pressure.

Also recommended is the addition of a 10-inch water line between the B level distribution system and the B level reservoirs near Norwood Road. This new pipe provides some distribution benefits, but it is primarily recommended as a redundant line from the reservoir. The B level is now vulnerable to a break or other failure in the only water line between the reservoir and the distribution system.

#### Service Level C

The area south of Ibach Road is served by the Level C pump station and storage reservoir. Construction on this system is nearing completion and the system will soon be ready for operation. Major loops in the Level C distribution system can be constructed in conjunction with future development. The future construction of major loops in the distribution system west to Graham Ferry Road will complete Phase I construction.

Phase II construction will entail completion of several loops west of Graham Ferry Road as well as a second connection with the Level B system on 108th. This connection will be controlled by a pressure regulating valve allowing flow from Zone C to Zone B when low pressures in Zone B warrant the flow.

#### COST ESTIMATES

The following cost estimates have been prepared based on the preliminary layout of the total system and 1983 prices. No attempt has been made to adjust prices to a future date.

The estimated costs are listed by pressure zone in Table 5.

TABLE 5  
WATER LINE COST ESTIMATES

| <u>Location</u>                                                                        | <u>Size</u> | <u>Quantity</u> | <u>Cost</u> |
|----------------------------------------------------------------------------------------|-------------|-----------------|-------------|
| PRESSURE ZONE A                                                                        |             |                 |             |
| Bridgeport Rd. to southwest City<br>limit then southeast to Lower Boones<br>Ferry Road | 12"         | 1920'           | \$81,000    |
| Boones Ferry, between Martinazzi and<br>Tualatin Road (Replaces 6" line)               | 12"         | 1390'           | \$58,000    |
| Hazelbrook (est.), between Cheyenne<br>Way and 103rd                                   | 8"          | 990'            | \$22,000    |
| 103rd Ave., between Tualatin Rd. and<br>Hazelbrook                                     | 8"          | 1800'           | \$44,000    |
| Industrial Area from 104th & Herman<br>Rd. east                                        | 12"         | 1280'           | \$50,000    |
| Tualatin Rd., between 104th & 108th<br>Ave.                                            | 12"         | 1000'           | \$42,000    |
| Nyberg, between I-5 (east side) and<br>Martinazzi (Replaces 10" line)                  | 16"         | 1950'           | \$96,000    |
| Boones Ferry Rd., between Tualatin-<br>Sherwood Rd. and PS#1 (Replaces<br>6" line)     | 12"         | 1240'           | \$66,000    |
| Area north of Nyberg adjacent to I-5                                                   | 8"          | 900'            | \$22,000    |
| Area north of Nyberg, between<br>I-5 and SW 6th (ext.)                                 | 8"          | 1810'           | \$44,000    |
| SW 65th Ave (ext.), north from<br>SW Nyberg                                            | 8"          | 900'            | \$22,000    |
| Hazelbrook Rd., between 103rd and<br>108th                                             | 8"          | 1300'           | \$32,000    |
| 108th Ave., between Tualatin Rd.<br>and Hazelbrook                                     | 8"          | 1800'           | \$44,000    |
| 108th Ave. between Herman Rd. &<br>Tualatin Rd.                                        | 12"         | 2250'           | \$95,000    |
| 108th Ave. (ext.), between Herman<br>Rd. & Tualatin-Sherwood Rd.                       | 12"         | 3180'           | \$134,000   |

|                                                                              |     |       |           |
|------------------------------------------------------------------------------|-----|-------|-----------|
| Hazelbrook Rd., between 108th and 115th                                      | 8"  | 2020' | \$85,000  |
| Hazelbrook Rd., between 115th Ave & Highway 99W                              | 12" | 1170' | \$49,000  |
| Highway 99W, between Hazelbrook & Tualatin Rd.                               | 12" | 1620' | \$68,000  |
| 115th Ave., between Hazelbrook & Tualatin Rd.                                | 12" | 1430' | \$60,000  |
| Tualatin Rd. between 108th & 115th                                           | 12" | 2030' | \$85,000  |
| Tualatin Rd., between 115th Ave & 99W                                        | 12" | 2200' | \$93,000  |
| Along western urban growth limits, south from Highway 99W                    | 12" | 3400' | \$143,000 |
| 115th Ave (ext.), from Tualatin Rd. South to Herman Road                     | 10" | 3120' | \$118,000 |
| Herman Rd. between 108th Ave & new road                                      | 12" | 4800' | \$202,000 |
| 99W, between west urban growth boundary and Tualatin Road                    | 12" | 3100' | \$130,000 |
| High density loop north of 99W south of the Tualatin River                   | 8"  | 2500' | \$60,000  |
| New road, north-south, south from 99W - Tualatin Road intersection           | 12" | 2650' | \$111,000 |
| New road, east-west, south of 99W, east from west urban growth boundary      | 12" | 3200' | \$135,000 |
| Myslony Road from 108th west to new road                                     | 12" | 4450' | \$187,000 |
| New road east-west, along the north line of Section 28                       | 12" | 2300' | \$97,000  |
| New road north-south, along the east line of Section 28                      | 12" | 870'  | \$37,000  |
| Through easements, from existing 12-inch in Tualatin-Sherwood Road northwest | 12" | 3850' | \$162,000 |
| West urban growth boundary, south from Southern Pacific Railroad and         |     |       |           |

|                                                                                                 |     |       |           |
|-------------------------------------------------------------------------------------------------|-----|-------|-----------|
| Herman Road                                                                                     | 12" | 1000' | \$42,000  |
| New road through proposed high tech campus, east of 115th                                       | 12" | 2320' | \$98,000  |
| Nyberg Lane from existing 12" to Orchard Road                                                   | 12" | 3600' | \$151,000 |
| PRESSURE ZONE B                                                                                 |     |       |           |
| North of Borland Rd., between 65th and Orchard Hill Rd.                                         | 10" | 4000' | \$151,000 |
| Orchard Hill Rd., from Borland Rd. (North leg) North                                            | 10" | 860'  | \$33,000  |
| Borland Rd., from Orchard Hill Rd. west to existing 12"                                         | 12" | 900'  | \$38,000  |
| Sagert St., between Boones Ferry and 93rd Ave (Replaces 8")                                     | 12" | 1270' | \$53,000  |
| Sagert St. between 93rd Ave and existing 12" line west (disconnect existing line from A system) | 12" | 1870' | \$79,000  |
| Burlington Norther R/W, between 102nd and Avery St.                                             | 12" | 1510' | \$64,000  |
| 105th Ave, between Blake St. and existing 12" line                                              | 12" | 660'  | \$28,000  |
| Ibach St. (ext.), Boones Ferry east to existing 12"                                             | 12" | 870'  | \$35,000  |
| Tualatin-Sherwood Rd. and road due south to proposed reservoir site                             | 12" | 3920' | \$165,000 |
| Blake St. between 105th Ave and Burlington Northern RR R/W                                      | 12" | 1290' | \$54,000  |
| 108th Ave, between Ibach St. and Blake                                                          | 16" | 1300' | \$64,000  |
| 108th Ave, between Marilyn Rd & Ibach St.                                                       | 16" | 1290' | \$64,000  |
| Ibach St., between 108th and Columbia Dr.                                                       | 10" | 2900' | \$110,000 |
| Tualatin-Sherwood Road, East from the west urban growth boundary                                | 12" | 4100' | \$172,000 |

|                                                                                                          |     |       |           |
|----------------------------------------------------------------------------------------------------------|-----|-------|-----------|
| Extension of Avery Road from existing 12" to Tualatin-Sherwood Road                                      | 12" | 800'  | \$34,000  |
| West urban growth boundary, north from Tualatin-Sherwood Road                                            | 12" | 1200' | \$51,000  |
| Blake, from Southern Pacific Railroad east to urban growth boundary then north to Tualatin-Sherwood Road | 12" | 3850' | \$162,000 |
| Orchard Road, from Nyberg Lane south                                                                     | 12" | 1100' | \$46,000  |
| West urban growth boundary, from Tualatin-Sherwood Road south then east                                  | 12" | 2000' | \$84,000  |
| Martinazzi, from existinng 10" to existing B level reservoir                                             | 10" | 4500' | \$169,000 |

#### PRESSURE ZONE C

|                                                                     |     |       |          |
|---------------------------------------------------------------------|-----|-------|----------|
| New road(s), between Graham Ferry & 108th Ave.                      | 8"  | 2530' | \$61,000 |
| Little Homes Rd., Between Graham Ferry & 108th Ave.                 | 10" | 1120' | \$42,000 |
| Little Homes Rd., between 108th Ave, & 112th Ave.                   | 8"  | 1360' | \$33,000 |
| SW 112th Ave., between Little Homes Rd. & SW Marilyn                | 8"  | 1570  | \$38,000 |
| 108th Ave, between Little Homes Rd. & Ada St.                       | 10" | 2370' | \$89,000 |
| SW Marilyn, between 108th & 112th Ave                               | 8"  | 1020' | \$25,000 |
| New road south of Ibach, between Dakota Dr. (Ext.) and Boones Ferry | 10" | 2310' | \$87,000 |
| Norwood Road, between Boones Ferry and road to Reservoir (B level)  | 10" | 1310' | \$50,000 |
| Boones Ferry Rd., between Norwood Rd. and new road south of Ibach   | 10" | 2360' | \$89,000 |
| Norwood Road, between Graham Ferry and Boones Ferry Roads           | 10" | 2230' | \$84,000 |

|                                                                                                 |     |       |          |
|-------------------------------------------------------------------------------------------------|-----|-------|----------|
| New road, between Boones Ferry &<br>Graham Ferry Rd.                                            | 8"  | 700'  | \$17,000 |
| Graham Ferry, between Norwood Road &<br>new road south of Ibach                                 | 8"  | 2990' | \$72,000 |
| Dakota Dr. (ext.), between City Limit<br>(south) and a new road south of Ibach<br>part existing | 10" | 900'  | \$34,000 |

#### MAIN HIGH PRESSURE TRANSMISSION LINES

##### A Level

|                                         |     |       |           |
|-----------------------------------------|-----|-------|-----------|
| Herman Road, from City Park to<br>108th | 18" | 6700' | \$446,000 |
|-----------------------------------------|-----|-------|-----------|

##### B Level

|                                                                 |     |       |           |
|-----------------------------------------------------------------|-----|-------|-----------|
| Boones Ferry Road, from City Park<br>to PS#7 (at Sagert Street) | 24" | 4100' | \$370,000 |
| Boones Ferry Road, from PS#7 to<br>Blake Street                 | 18" | 6700' | \$379,000 |

