INTERURBAN GROWTH:

CORVALLIS--PHILOMATH, OREGON

by

R. M. HIGHSMITH, III

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ABSTRACT: The cities of Corvallis and Philomath, Oregon, have, over the last three decades, grown both spatially and in numbers of people. This study examines the attractions and constraints to growth between the two cities. The most notable constraint to growth is the fact that the soils in the study area are almost exclusively poor for septic tank absorption fields and sewage lagoons. Resultingly, the area is zoned with large minimum lot sizes. Other constraints include: 1) poor soils for building construction, 2) a lack of public services, and 3) a lack of legislative authority to construct needed sewer and water lines. Attractions to growth include the covenient site location between Corvallis and Philomath and the fact that the majority of the area is undeveloped and zoned residential. With emplacement of sewer mains, substantial growth can be expected. Without sewer lines, though, growth will be much more limited.

THE PROBLEM AND PROCEDURE

In recent years more and more attention has been given to patterns of spatial growth by planners, geographers, and others. There seems to be little doubt that the growing

environmental awareness of the general public in America will have a great affect on the spatial directions of growth in the future. Such factors as soils, slope, sewerability, ecosystems and aesthetics are becoming increasingly important criteria in decisions concerning spatial growth.

Spatial growth occurs in a number of forms. It may develop in a radial pattern, centered on and expanding outward from some important institutional entity such as a school or a town square. It may develop in a leapfrog fashion, jumping high priced fringe land or prime agricultural land. It may also, and frequently does in America, develop in a sprawling fashion, covering all types of buildable land. And it may develop in corridors, following some important arterial on non-restrictively zone land.

Objective

The objectives of this research are: 1) to examine the spatial dynamics of growth--industrial, commercial, and residential--between Corvallis and Philomath, Oregon, in the period 1948 through 1975; 2) to examine attractions and constraints for growth in this interurban area; and 3) to predict growth of this area for the immediate future.

Research Procedures

To get a feeling for the study locale, the researcher initially traversed the area by automobile. At this time, it was decided that the research project was indeed valid, as the area did express a certain amount of growth. To become further familiarized with the area, the researcher then studied the various pertinent comprehensive and general plans.

Next, with the help of Soil Conservation Service air photographs, and urban growth map was compiled of the locale. This was accomplished by tracing progressive growth through interpretation of 1948, 1963, 1970, and 1972 air photos. Field research, including windshield survey, was then employed to update the 1970 and 1972 photos in early March, 1976. Subsequent vertical and oblique air photos were then used to check the previous updating.[1] A land use classification system for mapping developed by the North Carolina Section, American Institute of Planners, was the means used to record results of the interpretation.

The Benton County Zoning Ordinance,[2] the U.S.D.A.--S.C.S. Soil Survey of Benton County Area, Oregon,[3] and the Benton County, Oregon, Comprehensive Water and Sewerage Study[4] were used fairly intensely for reference during analysis. Zoning, soils, topographic, and political maps were also employed.

The Philomath General Plan,[5] the Benton County Comprehensive Plan,[6] and various Corvallis plans were used not only in analysis but also in estimating future trends.

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1 Air photography flown by the Oregon National Guard, March 28, 1976.

2 Benton County, Oregon, Zoning Ordinance, April 1, 1970, 31 pp.

3 U.S.D.A.-Soil Conservation Service, Soil Survey of Benton County Area, Oregon, July 1975, 119 pp.

4 CH2M-Hill, The Benton County, Oregon, Comprehensive Water and Sewerage Study, February 1972, 123 pp.

5 City of Philomath, Oregon, Philomath General Plan, 1974, 44 pp.

6 Benton County, Oregon, Urban Area Comprehensive Plan, 1988, May 1968, 18 pp.

THE STUDY AREA: SPATIAL AND POPULATION DYNAMICS

The study area encompases the land between Corvallis and Philomath, Oregon, or, more specifically, the land to the west and southwest of Corvallis proper and to the north and east of Philomath (see Fig. 1).

The perimeters are largely topographic limitations. The nothern and eastern boundaries roughly follow the Coast Range foothills and the southern perimeter approximates the flood-plain boundary of the Marys River. The major portion of the study locale is a topographic bench situated between these features.

The most dynamic sector in Benton County is the Corvallis district. Its growth is the key to growth in all adjacent districts, including Philomath. Between 1960 and 1970, the population of Corvallis increased by 70%, compared to an 18.2 percent increase for the whole state. In the same time span, the percent change in Philomath was 24.2.[7] It may be noted that both cities exceeded the state growth rate in that period. A further breakdown of growth over time in Corvallis and Philomath is presented below to further illuminate the overall development of the area.

Corvallis District

The urbanized portion of Corvallis covered an area equivalent to about three sections of land in 1948; in 1963,

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7 United States Bureau of Census, County and City Data Book, 1972, United States Department of Commerce, March 1973, pp. 390, 901.

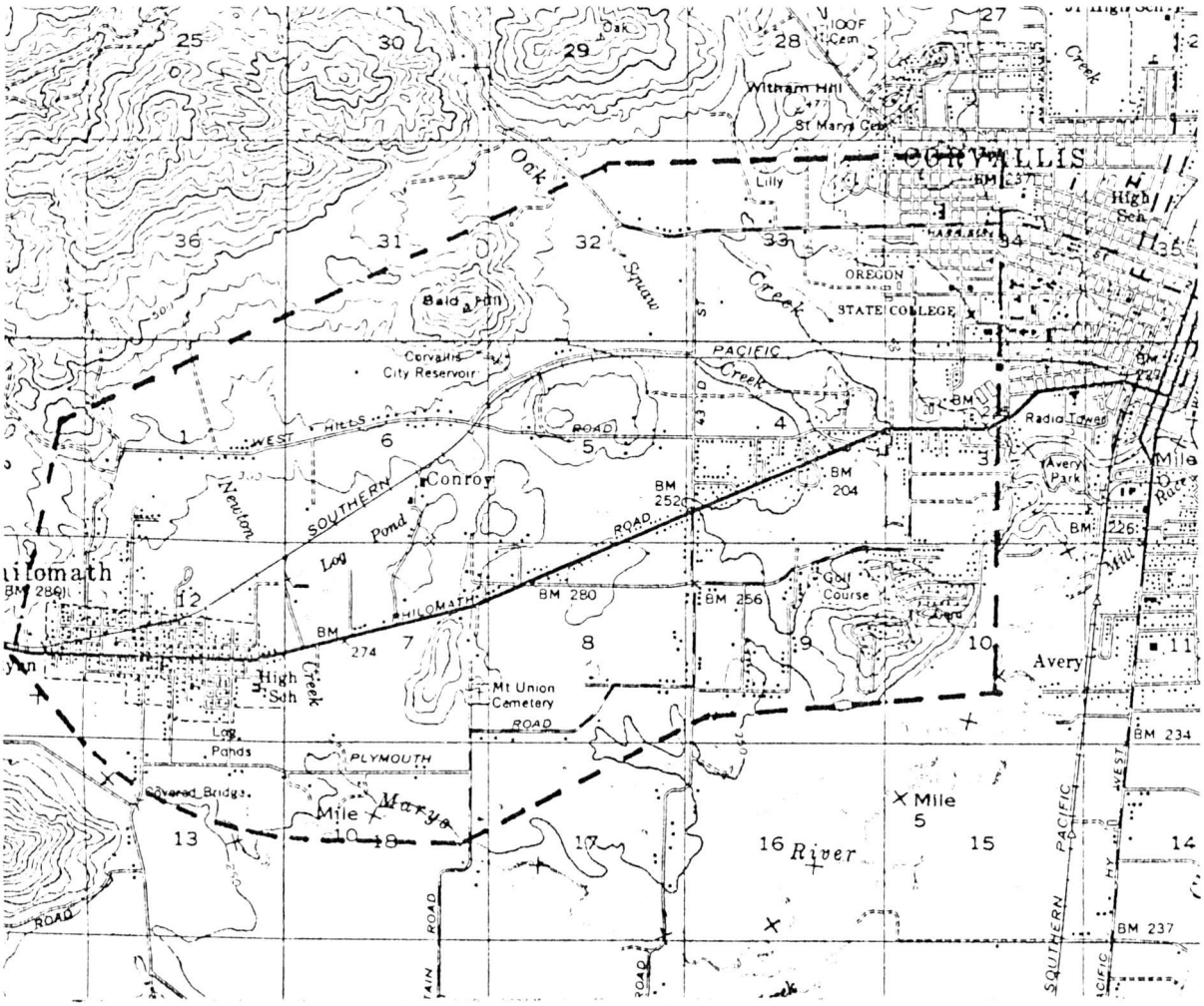

Figure 1- THE STUDY AREA. Map taken from the Corvallis, Oregon, Quadrangle, U.S.G.S., 1956.

it encompased five and one-half sections, and presently approximately eight sections. Stated differently, 1,920 acres of land were covered in 1948, while the 1976 total is approximately 5,120 acres. A total of 3,200 acres of land have been urbanized in a 28 year period.[8]

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8 Figures compiled by R. M. Highsmith, III.

TABLE 1 Population Trends

	1930	1940	1950*	1960	1970
PHILOMATH	694	856	1,289	1,359	1,688
% Change	17.4	24.6	50.6	5.4	24.2
CORVALLIS	7,585	8,392	16,207	20,669	35,056
% Change	31.9	10.6	94.2	27.3	69.6
RURAL BENTON COUNTY	8,970	10,837	15,363	18,496	18,623
% Change	--	20.8	41.8	20.4	.7
BENTON COUNTY	16,555	18,629	31,570	39,165	53,776
% Change	20.5	12.5	69.5	24.1	37.3
OREGON	953,786	1,089,684	1,521,341	1,768,687	2,091,385
% Change	21.8	14.2	39.6	16.3	18.2

The United States Bureau of Census, County and City Data Book.
*As of 1950, college students were considered residents of the community in which they were residing while attending college.

In 1940, the population of Corvallis was 8,392. The population grew to 16,207 in 1950 for a 10 year jump of 7,905 persons or a population increase of 94.2 percent.[9] In 1960, the population had grown to 20,669 for an absolute growth of 4,426 persons between 1950 and 1960, or 27.3 percent. Growth between 1960 and 1970 was 69.6 percent since the population grew by 14,387 persons to 35,056. The 1976 population of

9 For the 1950 census the Bureau of Census changed its urban definition to include university students residing in the urban area. This accounts for a part of the increase.

Corvallis can be estimated at approximately 41,000 based upon the 1970 through 1974 rate of growth [10] (see Table 1).

There have been several stimuli for growth, most noteworthy of which has been Oregon State University. Better than one-third of the 1975 population of Corvallis was made up of students and faculty members. Expansion has been primarily residential, though there also have been commercial and industrial additions. Definite patterns of growth are indicated which seem to be directed toward areas of least resistance.

Growth Directions. One of the most obvious aspects of Corvallis growth is the nongrowth to the east due to the location of the Willamette River. It serves as both a natural barrier and the county line between Benton and Linn Counties, hence a political barrier. The east bank of the river, because of its lower elevation, is much more susceptible to flooding than is the west bank.

Growth to the south has, except for one brief period (immediately after WW II), never been outstanding. This is due to a number of reasons, the most important of which is probably the susceptibility of the area to flooding from the Marys River. Also, the river itself may be considered a natural barrier. In more recent years there have been problems with sewage (the city has not seen fit to lay sewer lines

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10 United States Bureau of Census, Census of Population, 1974.

and the water table is high) and zoning (the area is zoned largely industrial). Growth is limited directly to the west because of University landholdings.

Present growth in Corvallis, understandably, is toward the nothern, northwestern, and southwestern directions. These areas are more desirable because they offer comparatively little resistance to growth.

Philomath District

The urbanized portion of Philomath in 1948 amounted to about 240 acres or a little less than one-third of one section. In 1963, 400 acres, or approximately five-eighths of a section, were covered with urban development. Presently, on the order of 480 acres or about three-fourths of a section, are urbanized. A total of 240 acres of land have been added to Philomath from 1948 to the present.[11]

The population has been on the increase also. In 1940, 856 persons lived within the city limits of Philomath. By 1950, the number had increased to 1,289 for a 50.6 percent increase. The 1960 population was 1,359, 70 more than a decade earlier, showing a ten year growth of 5.4 percent. Population by 1970 had grown to 1,688, 329 persons more than a decade earlier, for a growth rate of 24.2 percent. Based on a straight line projection of recent growth, the present population is approximately 2,100 for a yearly growth rate of 3.5 percent for the past six years [12] (see Table 1).

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11 op. cit., Footnote 8.

12 United States Bureau of Census, op. cit., Footnote 10.

The main stimulus for growth in Philomath has in the past been the logging and farming industries. In 1965, there were no less than eleven sawmills in the area immediately surrounding the city.[13] A different growth force has become increasingly strong, though, in recent years, namely the proximity of Corvallis and Oregon State University.

Growth Directions. Residential expansion has been primarily to the north and east. There also has been an arm of industrial development to the west along the Marys River. Growth seems to be moving toward areas of least physical restraint.

The major natural deterrent to growth in the Philomath area is the Marys River floodplain (Figure 3). All of the land to the south and west of the city is within the floodplain. Wood products plants and farming have developed in these areas through the years but little residential growth has occurred. Housing growth has been almost entirely on the higher ground to the north and west.

THE STUDY AREA: THE EVOLUTION OF URBAN USE

As noted in the previous section, the cities of Corvallis and Philomath are growing both spatially and in population. It would seem logical that some of that expansion would be directed toward the interurban area. To discover what growth has in fact taken place in the area, a study was conducted. Three periods, 1948, 1963, and early 1976, were chosen to

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13 op. cit., Footnote 8.

show growth over time.[14] The results of that study are as follows (see appendix A).

Section By Section Growth

Section 31, T. 11 S, R. 5 W. In the period prior to 1963, this area was essentially undeveloped, since it was farm land. Since 1963, and particularly since 1970, a subdivision has been developing in this section.

Section 32, T. 11 S, R. 5 W. Prior to 1948 the only noteworthy development in this section was the Benton County Fair grounds. In the 1948 to 1963 period a trailer park and grocery store were located here. Also added was a small housing development located in the center of the section and two sawmills located in the southern part. Since 1963, houses have been located in the northern sector and the trailer park has expanded. Also, part of the Fair grounds was rebuilt, and a part of the new Oregon State University horse barns was also located in this sector.

Section 33, T. 11 S, R. 5 W. Prior to 1948, the Oregon State University cow barns and turkey farm were the most dominant features in this section. Also, there was housing development to the south of Harrison Street. During the 1948 and 1963

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14 The 1948 and 1963 time periods were chosen because of the availablity of data.

15 This portion of the study should be read with the accompaniment of appendix A.

period continuous urbanization from Corvallis spread west to the Oregon State property line. To the north of Harrison Street, the eastern half of Witham Hill became urbanized. The most notable additons since 1963 have been the expansion of the Witham Hill development, the church of the Latter Day Saints, the horse barns, the animal quarantine buildings, and the new cow barns.

Section 34, T. 11 S, R. 5 W. and Section 3, T. 12 S, R. 5 W. Both of these sections were partly within the continuous urbanization bounds of Corvallis by 1948. By 1963 the urbanization has pushed westward as far as Oregon State boundaries except in the southern part of Section 3. The sector did not show substantial growth until the 1963 to 1976 period. It is presently rapidly filling in with single-family residences.

Section 4, T. 12 S, R. 5 W. Growth on the northern one-half of section 4 has been slight. A large part of that area is Oregon State University land. Hansen's chicken farm occupies another part. In the southern one-half there was scattered housing development before 1948, mostly following the arterial roads. Between that period and 1963 the area between Highway 20-34 and West Hills Road was largely filled in with single family residences. Since 1963 the area between the arterials has become almost completely urbanized. Not only was there housing development during that period, but a new state highways building and garage as well as a new highway were constructed.

Section 3, T. 12 S, R. 5 W. This section has one of the most diversified of development types in the whole study area. Prior to 1948, the section was primarily farm and forest land with a small number of single and multiple family residences. Also, the Baldy Hill pump station and a portion of the reservoir fall within this section and were built prior to that time. Between 1948 and 1963 two large sawmills were erected in the northern sector, two new sets of farm buildings were built and a grocery store and an auto wrecking yard were constructed. Also, the beginnings of a housing development in the N. E. quarter were evident as was a scattering of houses following West Hills Road. Since 1963 there has been additional housing along West Hills Road, but the most notable development has been the subdivision in the N. E. quarter. No less than eighty houses have been built in that sector since 1963.

Section 6, T. 12 S, R. 5 W. The only real development in this section before 1948 was the scattered housing along West Hills Road and the Baldy Hill reservoir. The large sawmill of which a portion is in the southern part of the section was also built before that time. Between 1948 and 1963 only a few scattered houses were built along the arterial. Recently, though, there has been housing development in the northern part of the section and new personal services buildings have been constructed at the intersection of the Southern Pacific Railroad and West Hills Road.

Section 1, T. 12 S, R. 6 W. Single-family housing has been the only noteworthy development in this section with the possible exception of a post 1963 school bus storage garage located in the southeast corner. Development lies mainly along the roads that traverse the area.

Sections 2 and 11, T. 12 S, R. 6 W. Only the southeast corner of Section 2 is included in the study area. Before 1963 there was no urban growth in this sector, but since that time the locale has provided land for numerous single-family residences.

By contrast, Section 11 has experienced continuous urbanization since before 1948. Growth can be seen to the north of the urbanized sector, but not in the flood prone southern sector.

Section 12, T. 12 S, R. 6 W. It is in this section that the majority of the City of Philomath lies. Prior to 1948 there was little growth south of the urbanized area. Growth for this period, however, was evident to the north. Between 1948 and 1963, the boundary of continuous urbanization spread to the north and west. Also, sawmills were located to both the north and south of Philomath proper. Since 1963 the northeast corner of Section 12 has become increasingly urbanized. Two additional sawmills have been built to the north of the city and interestingly, a multi-family residential complex was built to the south, on the floodplain.

Section 7, T. 12 S, R. 5 W. In 1948 this section was covered mostly by farms and a few scattered houses. In the northern sector a sawmill was located. From then until 1963, a few houses were built in the section along with two service industry buildings and another large mill. Since 1963 a subdivision has been located in the west-central sector (see Figure 2). That subdivision can now be considered within the boundaries of continuous urbanization.

Section 8, T. 12 S, R. 5 W. Most of the development in this section has been confined to the northern one-third. In the southern two-thirds, there has been scattered housing development through the years, while in the north, there has been not only residential growth but primary, secondary, and service industry development also. Most of the growth seems to fall along the main thoroughfare, Highway 20-34.

In 1948 development was sparse. By 1963 residences and service industries had been built. Since 1963 that trend has continued and been expanded with the addition of secondary business establishments.

Section 9, T. 12 S, R. 5 W. Development in Section 9 before 1948 was confined to a scattering of single-family residences. Between 1948 and 1963 the biggest areawide change came with the addition of the Corvallis Country Club golf course in the N. E. quarter. South and east of the course the Country Club Heights area began to grow. Also a number of houses, including a trailer court, were built in the western half of the section. Since 1963 the Country Club Heights sector has filled in, as has the development to the east of the golf course. In the rest of the section a few houses have been constructed and

Figure 2– PHILOMATH SUBDIVISION. Photography flown by the Oregon National Guard, March 28, 1976.

a number of trailers added.

Section 10, T. 12 S, R. 5 W. By 1948 a number of single-family residences had been built in the northwest corner of Section 10. In 1963 the majority of the northwestern quarter was urbanized. By 1975 that urban expansion had spread further south up the sides of the hills and had filled in the remaining gaps in the northern portion.

Section 13, T. 12 S, R. 6 W and Section 18, T. 12 S, R. 5 W. These two sections have been primarily reserved for agriculture because they fall within the Marys River floodplain. There has been scattered housing development through the years and a sawmill has located here between 1948 and 1963.

Conclusions

The first and most obvious conclusion is that the study area is developing. Corvallis urbanization is spreading westward toward Philomath. At the same time, Philomath is growing to the north and east, toward Corvallis.

There seems to be a residential-commercial corridor developing along Highway 20-34 between the cities. A study of appendix A will reveal that the corridor is filling in rapidly. In 1948, only a few scattered houses occupied the area. Presently, a number of secondary and tertiary industries as well as housing are located along the highway. West Hills Road also shows signs of becoming a residential corridor. Outside of those developing corridors, the most noteworthy recent residential growth has been to the north of West Hills Road in Section 31, T. 11 S, R. 5 W and Sections 5 and 6, T. 12 S, R. 5 W.

ATTRACTIONS AND CONSTRAINTS TO URBAN GROWTH

Growth will occur, at least on the local level, in those places that offer the least amount of resistance. Resistance is frequently in the form of physical constraints such as poor soils, steep slopes, landform obstructions, and high water tables. There may also be institutional, social,

political, and economic deterrents to growth. City services, the availability of land, and the specific zoning of an area all affects growth.

Physical Factors

Soils. Generally, the study area is dominated by deep, well-drained to poorly drained soils of the Willamette Valley terraces and by shallow to deep well-drained to somewhat poorly drained soils of the foothills.[16] Except for the latter, the soils are alluvial and fall mostly into the capability classes II and III. Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices. Class III soils have severe limitations that reduce the choice of plants, and/or require special conservation practices [17] (see appendix B).

It must be noted that nearly all the soils in the study area rate severe for building purposes (see Table 2). Dwellings without basements and particularly dwellings with basements require a moderate to high strength, well-drained soil with little shrink-swell potential. The soils in the study area almost exclusively fail to meet at least one of these requirements. Still, through the years, building has occurred (see appendix A).

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16 U.S.D.A.-S.C.S., Soil Survey of Benton County Area, Oregon, July 1975, p. 121.

17 U.S.D.A.-S.C.S., op. cit., footnote 16, p. 46.

TABLE 2 Soil Capabilities

USE / SOIL	Septic Tank Absorption Fields Rating	Restrictive Features	Sewage Lagoons Rating	Restrictive Features	Shallow Excavations Rating	Restrictive Features	Dwellings Without Basements Rating	Restrictive Features	Dwellings With Basements Rating	Restrictive Features	Local Roads And Streets Rating	Restrictive Features
AbB	Severe	Perc Slowly	Moder-ate	Slope, Excess Humus	Severe	Too Clayey	Severe	Shrink-Swell Low Strength	Severe	Shrink-Swell	Severe	Shrink-Swell
Am	Severe	Wet, Perc Slowly	Severe	Wet	Severe	Wet	Severe	Wet, Low Strength	Severe	Wet, Low Strength	Moder-ate	Shrink-Swell, Wet
Bn	Severe	Wet, Floods, Perc Slow	Moder-ate	Floods, Wet	Severe	Floods, Wet, Too Clayey	Severe	Shrink-Swell Floods, Wet	Severe	Shrink-Swl Floods, Wet	Severe	Shrink-Swell, Wet, Floods
Bo	Severe	Slow Perc	Severe	High Water Table	Severe	Wet, Floods Too Clayey	Severe	Shrink-Swell Wet, Floods	Severe	Shrink-Swl Floods, Wet	Severe	Shrink-Swell, Wet, Floods
BeC	Severe	Depth to Rock, Perc Slow, Slope	Severe	Depth to Rock, Slope	Moder-ate	Depth to Rock	Moder-ate	Shrink-Swell	Severe	Depth to Rock, Slope	Moder-ate	Depth to Rock Slope
BeD, BeE	Severe	Depth to Rock, Perc Slow, Slope	Severe	Depth to Rock, Slope	Severe	Depth to Rock, Slope	Severe	Depth to Rock, Slope	Severe	Depth to Rock, Slope	Severe	Depth to Rock, Slope
Cn	Severe	Perc Slow, Wet	Severe	Wet, Perc Slowly	Severe	Wet	Severe	Wet, Low Strength	Severe	Wet, Low Strength	Severe	Mod. Shrink-Swell, Wet
Co	Severe	Perc Slowly, Wet	Severe	Wet	Severe	Too Clayey, Wet	Severe	Shrink-Swell Wet	Severe	Wet, Shrink Swell	Severe	Shrink-Swell, Wet
Cs	Severe	Perc Slowly, Wet	Severe	Wet	Severe	Wet	Severe	Shrink-Swell Wet	Severe	Wet, Shrink Swell	Severe	Shrink-Swell, Wet
Da	Severe	Perc Slowly, Wet	Severe	Wet	Severe	Wet	Severe	Wet	Severe	Wet	Severe	Wet
DnC, DnD, DnE	Severe	Depth to Rock, Perc Slow, Slope	Severe	Depth to Rock, Slope	Severe	Too Clayey, Depth to Rock	Severe	Shrink-Swell Low Strength	Severe	Shrink-Swl Depth to Rock	Severe	Shrink-Swell, Low Strength
DuC	Severe	Perc Slowly, Wet	Severe	Slope	Severe	Wet	Moder-ate	Shrink-Swell Wet, Slope, Low Strength	Mod. to Severe	Shrink-Swl Wet, Slope, LowStrenth	Moder-ate	Shrink-Swell, Wet
HaC, HeC, HeD	Severe	Slow Perc, Too Clayey	Severe	Depth to Rock, Wet	Severe	Too Clayey, Depth to Rock, Wet	Severe	Wet	Severe	Depth to Rock, Wet	Mod. to Severe	Shrink-Swell, Too Clayey, Wet
Ma	Severe	Slow Perme-ability	Slight	Slope	Moder-ate	Mod. Shrink Swell	Moder-ate	Mod. Shrink Swell	Moder-ate	Mod. Shrink Swell	Moder-ate	Mod. Shrink-Swell
Mx	Severe	Slow Perc, Floods, Wet	Severe	Floods, Wet	Severe	Too Clayey, Floods, Wet	Severe	Floods, Low Strength	Severe	Floods, Wet	Severe	Shrink-Swell, Low Strength, Floods
PhE	Severe	Slow Perc, Slope	Severe	Depth to Rock, Slope	Severe	Slope	Severe	Shrink-Swell Slope	Severe	Shrink-Swl Slope	Severe	Shrink-Swell, Slope
PrD	Severe	Slow Perc, Slope	Severe	Slope	Mod. to Severe	Depth to Rock, Slope	Mod. to Severe	Slope	Severe	Slope	Mod. to Severe	Slope
VaB	Severe	Slow Perc	Moder-ate	Slope	Moder-ate	Too Clayey	Moder-ate	Shrink-swell Low Strength	Moder-ate	Shrink-Swl LowStrenth	Moder-ate	Shrink-Swell, Low Strength
Wa	Severe	Slow Perc, Floods, Wet	Severe	Floods	Severe	Wet	Severe	Wet, Floods, Low Strength	Severe	Wet, Floods LowStrenth	Severe	Shrink-Swell, Wet
WeA, WeC	Slight to Mod.	Slope	Moder-ate	Mod. Perm-eability	N/A	N/A	Moder-ate	Mod. Wet, Mod Shrink-Swell	Moder-ate	Mod. Shrink Swl Mod Wet	Moder-ate	Mod. Shrink-Swell
WkB	Severe	Slow Perc, Wet	Severe	High Water Table	Severe	Wet	Severe	Shrink-Swell Wet	Severe	Shrink-Swl Wet	Severe	Shrink-Swell
WoA	Severe	Slow Perc, Wet	Severe	Wet	Mod. to Severe	Wet	Moder-ate	Low Strength	Severe	Wet	Moder-ate	Low Strength

Adapted from "File Code Soils 12," U.S.D.A. Soil Conservation Service, 1971 and 1972; and from Soil Survey of Benton County, Oregon, U.S.D.A.-S.C.S., July, 1975

Building prior to 1948 centered mainly along the urbanized boundaries of Corvallis and Philomath. During that time little thought was given to the suitability of the soils for building as is shown in the examples below: 1) the housing development in the middle of Section 4, T. 12 S, R. 5 W was located on

Hazelair complex and Waldo silty clay loam soils. Both of these soils are classed as too wet for building; moreover, they are susceptible to flooding from Squaw Creek; 2) the housing development around the intersection of 53rd street and Highway 20-34 was also located on Waldo silty clay loam as well as on the more suitable Woodburn silt loam; 3) the housing development directly north of Philomath proper was located on Bashaw clays which are classed as too wet for building.

Site choices for housing between 1948 and 1963 were little better in respect to soil capability. Three major sites of growth during the period were: 1) the N. W. quarter of Section 9, T. 12 S, R. 5 W where houses were built on Amity silty clay loam, a low strength and wet soil; 2) directly south of Philomath, adjacent to the log pond where houses were built on wet Coburg silty clay loam within the Marys River flood plain; and 3) along Oak Creek Road in Section 32, T. 11 S, R. 5 W where houses were built in Bashaw clay and Waldo silty clay loam, both of which are wet and susceptible to flooding.

Mistakes were also made in respect to soils in the placement of housing between 1963 and the present. The housing development due east of Philomath along Highway 20-34 is located on wet Dayton silt loam, for example, and the new development in the southern part of Section 31, T. 11 S, R. 5 W and the northern part of Section 6, T. 12 S, R. 5 W is located entirely on soils with high shrink-swell potential.

Slope. Slope is one physical factor that is not particularly a problem to development in the study area (see Figure 1).

Slope becomes extreme only along the northwestern perimeter of the study area and on the sides of Baldy Hill, the summit of which is located in the S. E. quarter of Section 31, T. 11 S, R. 5 W. Slight slope problems are evident also in the northern one-half of Section 5, T. 11 S, R. 5 W.

Comparatively little building occurred before 1963 in areas of extreme slope within the study area. More recently this has changed, however, as can be seen by the housing developments in the southern half of Section 31, T. 11 S, R. 5 W, the northern quarter of Section 6, T. 12 S, R. 5 W, and the eastern part of Section 2, T. 12 S, R. 6 W, most of which have been built on slopes ranging from two to forty-five percent.

Sewerability. The study area is almost exclusively poor as far as sewerability is concerned. Every soil, with the exception of the Willamette silt loams, is rated by the U.S.D.A.-S.C.S. as severe for septic tank absorption fields (see Table 2). The majority of the soils also are rated severe for sewage lagoons. This sewerabiltiy problem has been extremely detrimental to growth in the study area through the years. In more recent years, as the importance of septic tank absorption fields has been increasingly recognized, this has affected building permits and lot sizes. The only real foreseeable solution to the problem is the emplacement of sewer lines throughout the area.[18] The

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18 This is assuming that dry sewage systems do not become feasible in the immediate future.

existing and proposed sewer mains are discussed later in this report.

Landform Observations. The study area, being relatively flat terrain covered almost entirely by alluvial soils, has little sharp relief. A north to south cross section of the area would show gently rolling foothills merging with a terrace which is generally flat, and which in turn merges gradually with the Marys River flood plain. The most notable obstruction would probably by Baldy Hill which rises only 250 to 350 feet above the surrounding area (see Figure 1).

Institutional Factors

Oregon State University Landholdings. Oregon State University owns or leases more land within the study area than any other entity. Section 33, T. 11 S, R. 5 W from the limits of Corvallis continuous urbanization west to 53rd Street is almost entirely owned by Oregon State University. To the north of Harrison Street the University owns land as far west as the N. E. quarter of Section 32, T. 11 S, R. 5 W, the present location of the horse barns. The northern part of Section 4, T. 12 S, R. 5 W is also Oregon State land. It can be seen by studying the outline of continuous urbanization for Corvallis in appendix A that these land holdings have definitely retarded growth to the west.

The urbanization bulge following Highway 20-34 and West Hills Road approximately borders Oregon State University landholdings to the north. It is impossible to tell how much of the land would be presently urbanized if it were in private ownership. The housing development in the N. E. quarter of

Section 5, T. 12 S, R. 5 W is also worthy of note. It is easy to imagine that development spreading accross 53rd Street if that land were in private ownership.

Public Service Available. In areas where sanitary sewers are not available, sewage disposal is most often accomplished by septic tanks and underground drainfield installations. Performance of the system is dependent upon soil permeability and depth of ground water. Permeable soil, not subject to high ground water levels or flooding, generally is acceptable for this means of disposal.

As has been shown the soils in the study area are largely inadequate for septic tanks and drainfields. The majority of the area is too wet with a percolation rate far too slow for the environmentally safe establishment of these types of systems (see Table 2). The only economically feasible solution to this problem is the establishment of sewer lines. In order to provide sewage collection for an area such as this some form of organization must be established which has the legislative authority to finance, construct, and administer the facilities. There are four separate types of organizations which have this authority in Oregon. They are: 1) incorporated municipalities, 2) sanitary districts, 3) county service districts, and 4) area wide sanitary authorities.[19]

A major portion of the study area, that is the portion that falls outside the city limits of both Corvallis and Philomath, presently has no legislation authority for

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19 CH2M-Hill, Benton County, Oregon, Comprehensive Water and Sewerage Planning Study, 1972, pp. 92-93.

construction of sewer lines. But between the ultimate service area limits of both cities most of the area is covered (see appendix C). The proposed pipelines, if constructed, would greatly alleviate the problem and probably enhance growth. Before that can happen, approval must be received from the voters within the city limits of Corvallis and/or Philomath (depending upon the line in question) because pipelines are built by municiple authority. Annexation naturally would help considerably in solving this problem, but it is extremely difficult at this time to predict if, when, and where annexation will occur.

Water for the city of Corvallis system is obtained from two sources, the Marys Peak watershed and the Willamette River. The City of Philomath, on the other hand, supplies its municipal requirements with water purchased from the Corvallis system. Under the terms of a 1960 agreement, Corvallis is obligated to supply the city of Philomath with 7.5 million gallons per month for a period of twenty years. Water may also be furnished in excess of that amount if available from the Corvallis systems. During recent years the water demands during the months of peak usage have exceeded the 7.5 million gallons a month allowed.[20] Naturally, this poses a problem for the Philomath portion of the study area. It has been estimated that by 1990 Philomath will require the entire output of the Rock Creek treatment plant (the plant where the Marys Peak watershed enters the system).[21]

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20 CH2M-Hill, op. cit., Footnote 19, pp. 104-05.

21 CH2M-Hill, op. cit., Footnote 19, p. 105.

There are two possible solutions to this dilemma. One, additional storage reservoirs may be installed to collect water during non-peak periods (see appendix C) and two, the ultimate purchase by Philomath of Corvallis' Rock Creek water system should be considered. Corvallis potentially can meet its water needs from the Willamette River alone, so no great hardship would result from the transaction.

The area between the two cities has in the past depended largely upon wells. This dependence has not been exclusive, however, as feeder lines have been attached to the mains that run through the area to serve adjacent housing developments. If the proposed lines are actually layed (see appendix C), most all water problems for the area would be alleviated.

Zoning. The majority of the study area is outside municiple boundaries and as a result was zoned by Benton County. As is frequently the case with this implementation technique, zoning has changed throughout the district from time to time.

The largest portion of the study area is presently zoned RU-1 and RU-2 (see Figure 3). Both are urban residential designations with the numerals indicating minimum lot sizes, e.g. RU-2 indicates two-acre lot size. The permitted uses within these urban residential zones include farming, single family residences, schools and churches, parks, planned development, and industrial operations in existance at the time the zoning ordinance was adopted.[22] The real limiting factor for residential growth is the minimum lot size.

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22 Benton County, Oregon, Zoning Ordinance, April 1970, p.8.

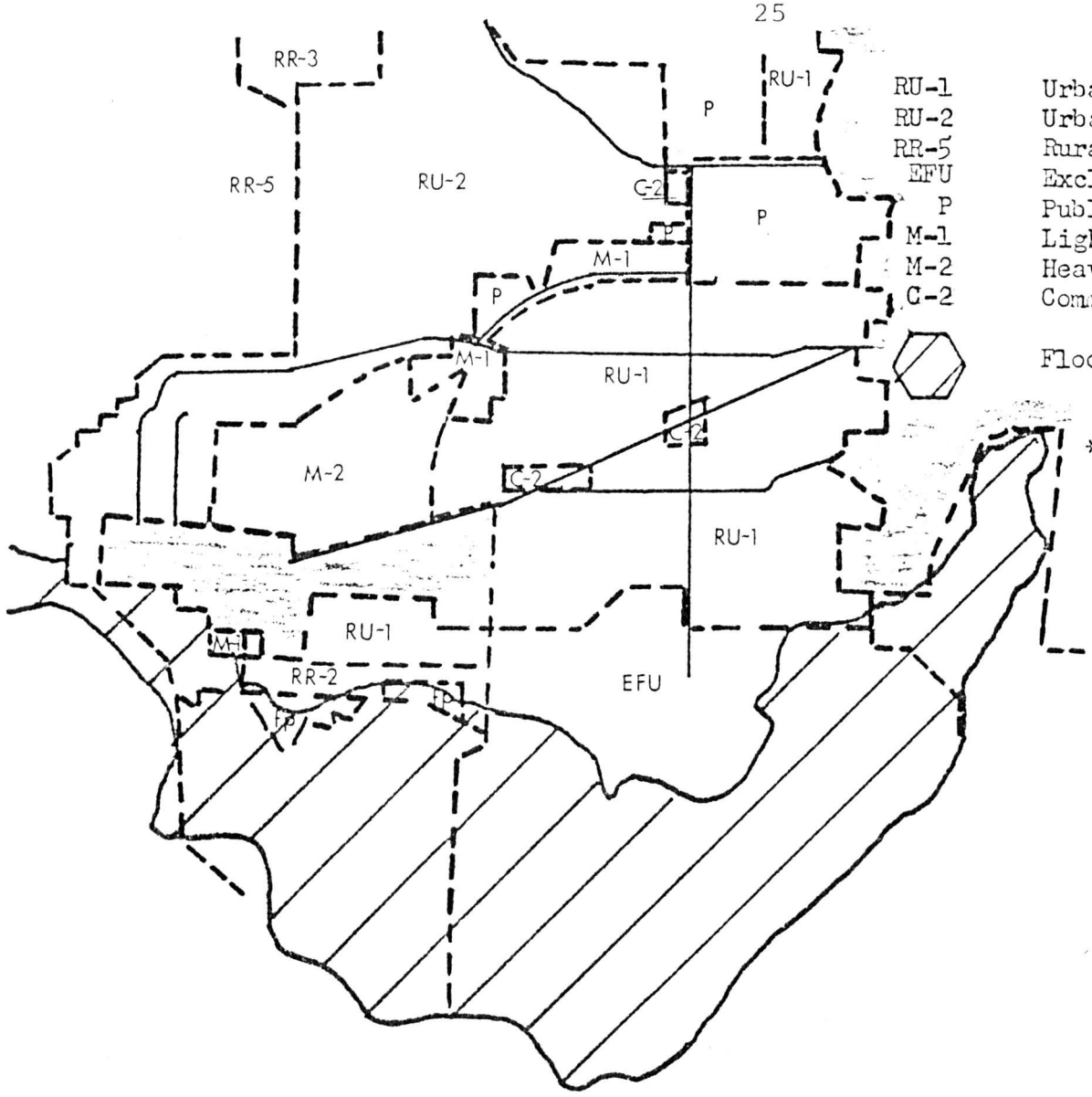

Figure 3 - ZONING AND FLOOD PLAIN. Adapted from the Benton County General Zoning Map, 1974.

The rural residential (RR) districts are similar to the urban residential zones except they are slightly more restrictive in permitting uses and lot sizes are generally larger. These districts may be found to the north and south of Philomath.

The area to the northeast of Philomath is zoned M-2 or heavy industrial. Presently there are a number of sawmill operations within that zone. M-2 is the most permissive district as any use is permitted so long as it meets environmental goals.[23]

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23 Benton County, Oregon, op. cit., Footnote 22, p. 15.

There is also an industrial strip following West Hills Road, this zone designation is M-1 or light industrial. Any use is permitted here including retail, wholesale, and service establishments, farming, public parking facilities, seed cleaning, freight terminals, government buildings, and manufacturing and repair industries so long as the use does not create a nuisance because of order, noise, dust, smoke, or gas.[24]

In the middle of the M-1 district is a P (Public Use) district. This zone surrounds Baldy Hill, a City of Corvallis property. The other public use districts in the study area are the Oregon State University landholdings.

The C-2 (Community Commercial) districts are found along Highway 20-34 and 53rd Street. Permitted uses include retail stores, offices and a large number of types of service establishments.[25]

The exclusive farm use (EFU) zones fall mainly along the marginal flood plain. The only unconditionally permitted uses are farming, public parks and recreation facilities and park utilities which are aesthetically compatible.[26]

Zoning need not be an insurmountable obstacle to growth. There are a number of ways to get around it, including conditional uses, general exceptions, special exceptions, and

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24 Benton County, Oregon, op. cit., Footnote 22, p. 14.

25 Benton County, Oregon, op. cit., Footnote 22, p. 11.

26 Benton County, Oregon, op. cit., Footnote 22, p. 7.

variances. Amendments also are continually made to zoning ordinances as an area changes. There is a good possibility that zone changes will become a common occurrence in the study area in years to come.

Social Factors

It is difficult to discern whether or not there is social pressure favoring one type of land use as opposed to another in the study locale without an areawide survey of opinions. Conjecture is the only source of information. With a growing public awareness of the environment, it can be surmised that there might be some demand for open space, aesthetically pleasing construction, and pollution free industry. There might also be some concern for the preservation of farmland. But until there is an actual survey taken, any criteria using social values will have to be estimated and very broad in nature.

Political Factors

The most noteworthy political constraints to growth in the study area are the municipal boundaries of Corvallis and Philomath. Any development outside the city limits of either of the municipalities would be ineligible for city services. As mentioned earlier this constitutes a problem, as both water and sewerage are more difficult to receive in the unincorporated areas. Though the county is responsible for the construction and upkeep of the roads in the non-municipal ares it frequently lags behind the cities in quality of service. Police and fire protection also is less substantial in the areas outside Corvallis and Philomath.

Once again the matter of annexation arises. In order for an outlying area to receive city services, it must either be voted the privilege or annexed by the city.

Economic Factors

It should be noted that there is a cause and effect relationship between population and economic conditions. Summarized briefly, the population in Benton County will not grow significantly by natural increase alone. New sources of employment will be required to produce rapid population gains of the magnitude that occurred in the county the last decade.

Government, employing forty-nine percent of all workers, is the major industry in the county. Eighty-six percent of those employees are employed by the state or federal government. Oregon State University is the employer of a large number of these individuals.[27]

Manufacturing in 1970 employed only 11.8 percent of the county workers.[28] This is far below the national and state averages. However, with the addition of the new manufacturing plant in northeast Corvallis and the growing manufacturing concerns near the Corvallis airport, this percentage should grow substantially, as will the general population and the need for housing.

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27 The United States Census Bureau, op. cit., Footnote 7, p. 392.

28 CH2M-Hill, op. cit., Footnote 19, p. 11.

Prospects for expansion in the two current major manufacturing industries in the county are not promising. Forest products are experiencing a decline in the number of plants and a consolidation of smaller plants into larger, more modern facilities. Output has been steadily declining the last five years or so as competition from new plants in the south and southeast United States has reduced the demand for northwest lumber.[29]

Agriculture employment has declined steadily and can be expected to decline further through the rest of this decade. Mechanization and increased farm size are partly to blame, but the trend away from farming marginal land and the trend toward urbanization of prime land have also had effects.

The major economic impetus for growth in the study area over the next decade or so will probably be two fold: First, the area is located next to Oregon State University. Although the University has currently a growth ceiling, it can be expected to continue as one of the attractions for research and development activities. Second, the placement of both of the Hewlett Packard plant in northeastern Corvallis and the growing industrial complex to the south of the city should, according to projections, accelerate the population increase for the county. The study area might also provide a partial answer to the saturated occupancy level presently seen in the city of and the area surrounding Corvallis.

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29 Clay Myers, Oregon Blue Book, 1975-76, pp. 153-55.

Transportation

The major arterials in the area are Highway 20-34 and West Hills Road, both running approximately east-west, and 53rd Street running north-south. The rest of the road system is not particularly well developed and cannot be expected to become so until there is a greater demand for improvement.

Rail access to the area is provided by Southern Pacific whose line roughly bisects the study locale. Charter airplane service is available from the Corvallis airport.

PROSPECTS FOR IMMEDIATE GROWTH

The most obvious constraint to substantial growth in the study area is the soils. Because they have such limitations as slow percolation, a tendency to flood, and a high water content, the soils are almost exclusively rated severe for septic tank absorption fields and sewage lagoons by the the U.S.D.A.-S.C.S. (see Table 2). As a result of this the zoning of the area requires from one to five acres per lot for housing constructions. With this type of zoning, dense development, obviously, cannot be expected.

There are, on the other hand, a number of features in the study area attractive to growth. Both Corvallis and Philomath are expected to grow substatially during the next 15 years (see Table 3). That growth must be absorbed somewhere and, but for for zoning, the study area is situated ideally. It may be seen in appendix A that urbanization bulges from both Corvallis and Philomath are encroaching on

TABLE 3 Population Projections

CENSUS SUB-DISTRICTS	1976 HIGH	1976 LOW	1981 HIGH	1981 LOW	1990 HIGH	1990 LOW
CORVALLIS	45,500	42,830	54,200	48,600	69,000	61,000
PHILOMATH	5.060	4,480	5,780	4,740	7,300	5,125
CITY OF PHILOMATH	2,050	1,860	2,350	2,030	2,800	2,300

The Benton County, Oregon, Comprehensive Water and Sewerage Study, CH2M-Hill, 1972

the area. And growth corridors are developing along the main arterials. The locale has become increasingly popular for the location of businesses, services, and industries. This trend cannot be expected to accelerate because of the sewerability problems, however.

If the area acquires the sewer lines proposed in appendix C, though, a gradual merging of Corvallis and Philomath can be expected. The area urbanized would lie north of the flood plain and skip over Oregon State University landholdings. Residential development would be the norm with patches of commercial development spread along the main arterials. Industrial development cannot be expected at this time due to the decline in the logging industry.

In conclusion, growth depends on a number of factors, the most important of which is the sewerability problem. If sewer mains are laid through the area, substantial growth can be expected. Both Corvallis and Philomath are expected to grow

rapidly in the near future because of new industry locating in the Corvallis area. The study area could not only help to accommodate some of that growth but could also help to alleviate the housing saturation problem presently facing Corvallis. If, on the other hand, sewer lines are not layed through the area growth will occur but much less densely and at a much slower rate.

REFERENCES CITED

Benton County, Oregon. Zoning Ordinance--Benton County, Oregon. 1 April, 1970.

Benton County Planning Commission. Urban Area Comprehensive Plan, 1988. May, 1968.

Cornell, Howland, Hayes, and Merryfield--Hill. Benton County, Oregon, Comprehensive Water and Sewerage Study. Project No. C6589.0, Feb., 1972.

Myers, Clay. Oregon Blue Book, 1975-1976. Salem: Clay Meyers, Dec., 1974.

Philomath City Planning Committee, et al. Philomath General Plan. 1974.

United States Bureau of the Census. County and City Data Book, 1972. United States Department of Commerce, Social and Econonic Statistics Administration, March, 1975.

United States Department of Agriculture--Soil Conservation Service. Soil Servey of Benton County Area, Oregon. Washington, D.C.: U.S.D.S., July, 1975.

Scale 1:21 000

APPENDIX A

INTERURBAN GROWTH[1]

Legend[2]

1976 1963 1948

SINGLE-FAMILY RESIDENTIAL[3]

MULTI-FAMILY RESIDENTIAL[4]

PRODUCTION
- 211 Extractive/Agriculture (farmyards)
- 221 Manufacturing/Durable
- 232 Utilities
- 233 Miscellaneous

BUSINESS
- 311 Primary Retail Trade
- 312 Secondary Retail Trade
- 313 Convenience Trade

SERVICES
- 410 Consumer Services
- 411 Personal Services
- 412 Amusement Services
- 413 Transportation Terminals
- 431 Repair Services

SOCIAL AND CULTURAL
- 612 Religious
- 613 Recreational
- 621 Medical
- 622 Instutional
- 623 Oregon State University Buildings

WATER

EXTENT OF CONTINUOUS URBANIZATION

[1]Map compiled by R. M. Highsmith, III

[2]Code borrowed from the Land Use Classification Committee, North Carolina Section, American Institute Of Planners

[3]Each dot represents one dwelling

[4]Each dot represents two dwellings

Scale 1:20 000

APPENDIX B

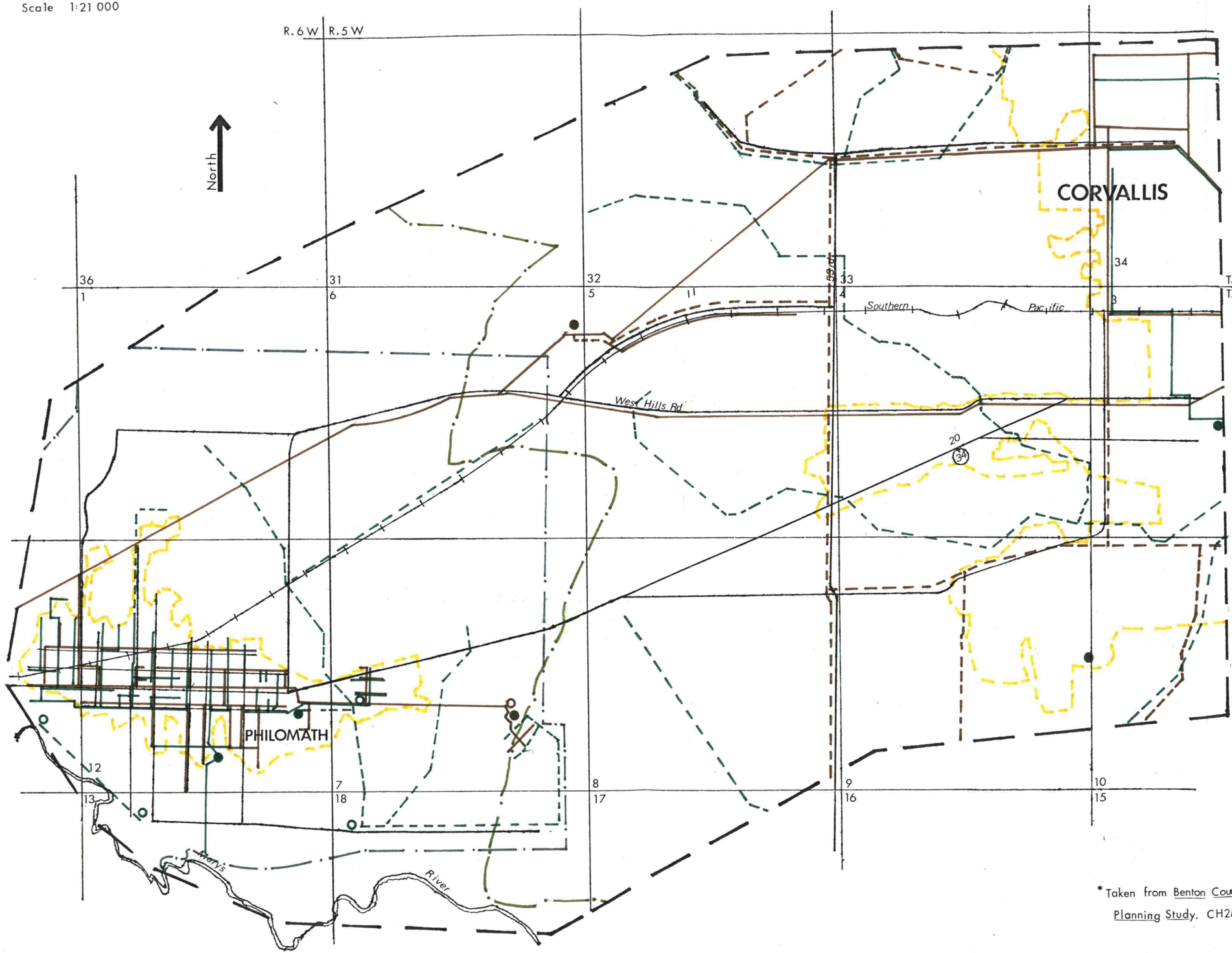
SOILS*

Legend

AbB	Abiqua silty clay loam, 3 to 5 percent slopes
Am	Amity silty clay loam
Ba	Bashaw silty clay loam
Bc	Bashaw clay
BeC	Bellpine silty clay loam, 3 to 12 percent slopes
BeD	Bellpine silty clay loam, 12 to 20 percent slopes
BeE	Bellpine silty clay loam, 20 to 30 percent slopes
Cn	Coburg silty clay loam
Co	Concord silt loam
Cs	Conser silty clay loam
Da	Dayton silt loam
DnC	Dixonville silty clay loam, 3 to 12 percent slopes
DnD	Dixonville silty clay loam, 12 to 20 percent slopes
DnE	Dixonville silty clay loam, 20 to 30 percent slopes
DuC	Dupee silt loam, 3 to 12 percent slopes
HaC	Hazelair silt loam, 3 to 12 percent slopes
HeC	Hazelair complex, 3 to 12 percent slopes
HeD	Hazelair complex, 12 to 20 percent slopes
Ma	Malabon silty clay loam
Mn	McAlpin silty clay loam
PhE	Philomath silty clay, 12 to 45 percent slopes
PrD	Price silty clay loam, 12 to 20 percent slopes
VeB	Veneta silt loam, 2 to 7 percent slopes
Wa	Waldo silty clay loam
WeA	Willamette silt loam, 0 to 3 percent slopes
WeC	Willamette silt loam, 3 to 12 percent slopes
WkB	Witham silty clay loam, 2 to 7 percent slopes
WoA	Woodburn silt loam, 0 to 3 percent slopes

*Reprinted from the Soil Survey of Benton County, Oregon, USDA–SCS, July, 1975

Scale 1:21 000



APPENDIX C

WATER AND SEWERAGE SYSTEMS*

Legend

WATER

- Existing Pipelines
- Proposed Pipelines
- Existing Reservoirs
- Proposed Reservoirs

SEWERAGE

- Existing Sewer Main
- Proposed Sewer Main
- Existing Pump Station
- Proposed Pump Station

SERVICE AREA LIMITS

- Corvallis
- Philomath

- Present Extent Of Continuous Urbanization

* Taken from Benton County, Oregon, Comprehensive Water and Sewerage Planning Study, CH2M-Hill, Project No. C6589.0, Febuary, 1972