DETECTING LAND USE CHANGES
IN AGRICULTURAL AND WOODLANDS
BY THE USE OF AERIAL PHOTOGRAPHS

by

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A TECHNICAL REPORT
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I. Purpose

The purpose of this paper is to show the amount of land use change taking place between 1963 and 1974 in T. 11 S., R. 4 W., W.M., which is located between Albany and Corvallis. The changes of primary interest involve the shifts of agricultural land to residential, commercial and industrial use. In addition, other land use shifts and their effects on agricultural land are to be noted.

II. Objectives

1. Develop a method to show amounts and types of land use change by using aerial photographs.
2. Use this method to find the amount of change in the study area.
3. Find the amount of agricultural and woodland lost to other uses.

III. Methodology

The following basic steps were used to determine the classification types and acreages for each section within the township.

1. The dates chosen for the aerial photos used in the study were based on the following criteria.
   a. Access and availability of aerial photos.
   b. Suitability of available dates to give adequate coverage over time.
   c. Obtaining the most recent photo date available.
   d. Aerial photo scales available.

2. Based on the above criteria, the aerial photos flown during the following years were chosen.
   
   1963  1:20000 Black and white
   1971  1:63360 Color
   1974  1:63000 Black and white

3. A classification system was then devised for the different land uses identifiable on the photos. The number of classifications used in the system were based on:
a. The number of different uses observed in the photos.
b. The objectives of the study and the type of classification system needed to meet these objectives. (See appendix for classification designations.)

4. After the classification system was formed, the area in acres of each type was determined for each section. These areas were found by photographically enlarging the 1971 photos to a scale approximating 2"=1 mile. A grid of 256 dots to the square inch was placed over each section, and the number of dots covering each type was counted. Using the above scale and dot grid intensity, each dot represents 0.625 acres.

5. Because the 2"=1 mile scale was an approximation, it was felt that the dot count alone would not give a true area. To overcome this, the exact area of each section on the original 1971 photo was determined by using a planimeter. The area of each type was then found by the following ratio:

\[
\frac{\text{number of dots per type per section}}{\text{total number of dots per section}} \times \frac{\text{total area per section obtained by planimeter}}{\text{classification type}} = \text{actual area of each classification type}
\]

6. Distortion in the photos was not corrected because of the complexity and cost involved. Any distortion that was present would probably be minimal, since the study area is relatively flat and topographic distortion decreases with an increase in flying height. The only major changes in elevation are in the northwest and northeast corners of the township.

7. After the 1971 photo was classified and the areas found, the 1963-1971 and 1971-1974 changes were determined based on the 1971
information. The 1971 photo series was used as a base because it was in color, which made it easier to classify than the black and white photos.

IV. Discussion of Results

A. General Overview of Use Changes

This study shows that the land use characteristics of T. 11 S., R. 4 W., W.M., have been gradually shifting from woodland and agricultural use to one with increasing residential, commercial and industrial use. The shift has ranged from zero change in some sections, to Section 26 which has lost almost 20% of its agricultural land to commercial and residential development. Also, the acreage of gravel pits has increased almost 250% during the 1963-1974 study period. This increase in gravel pits, coupled with the increases in residential and commercial developments, has removed an area equivalent to three-quarters of a section from wooded, semi-wooded, and agricultural use. (For acreage changes see Fig. 1 and Tables 3, 4, 5 and 8.) The majority of these changes have been taking place in Linn County (east of the Willamette River), where the land is zoned primarily suburban residential (SR) and urban residential (UR). The Benton County side of the township (west of the Willamette River) is zoned primarily exclusive farm use (EFU), with some areas zoned rural residential (RR) and residential urban (RU). (See Map 1 for zoned areas.) The effect of the Benton County zoning ordinances has helped to concentrate development in specific areas, leaving most of the land zoned EFU for agricultural purposes. Linn County, with the majority of its
Figure 1
Comparison of Acreage Changes
land zoned residential, has development throughout its farming regions (see Map 3).

The major portion of the land use change has taken place in five specific areas scattered throughout the township. These areas are:

1. The southwest corner of the township in Sections 19 and 32.
2. Sections 24 and 25 along Highway 99E.
3. The northeast corner of the township in Sections 1 and 2.
4. Sections 9, 16 and 17 between the highway and the Willamette River.
5. Along the highway in Sections 32 and 33.

The first three areas listed are mostly agricultural land shifting to residential and commercial development. The fourth is where most of the gravel pit expansion is taking place. The last area is commercial and light industrial development along the highway leading from Corvallis to the freeway. (See Maps 2 and 3 for specific changes.)

B. Agricultural and Woodland Changes

1. General Gain-Loss Trends

The change in the acreage of useable agricultural land located within the township is influenced by the amount of accessible wooded and semi-wooded land that can be converted to agricultural use. In addition, the amount of agricultural land is influenced by zoning and the amount of land being withdrawn for gravel pits, commercial and residential use. This interrelationship between agricultural gains and losses has kept the total amount of agricultural land fairly constant during the 1963-1971 study period, resulting in a net agricultural loss of 184.59 acres which equals 1.2% of the 1963 agricultural land base.
It should be noted that the 184.59 figure is a net loss and not a total change. The total amount of agricultural land that has shifted into residential, commercial, industrial, and other uses is 362.92 acres, which is almost twice the net amount. About 68 acres of this loss was to orchard, so only about 295 acres of land can be considered totally lost to agricultural type uses. The 362.92 acres lost to other uses was partially offset by woodland and semi-woodland areas being converted to agricultural use. From 1963 to 1971, 118.46 acres of woodland areas were converted to agricultural land, and from 1971-1974, another 56.74 acres were converted. Thus, over the eleven year period, 175.20 acres of woodlands shifted to agricultural use, which resulted in the net loss figure of 184.59 acres. This amount does not seem as critical when compared to the loss of 362.92 acres.

It should be noted that the woodlands are acting as a reserve account to the agricultural land, in that the woodlands are slowly changing to agricultural use. Unfortunately, this reserve account is gradually being depleted, and there is nothing it can draw from to replenish its losses.

The total amount of woodland and semi-woodland areas that have shifted to other uses is 307.74 acres, which is 8.1% of its 1974 acreage. This loss is serious because when the woodlands are gone, there is nothing else to convert to agricultural use, and all remaining residential, commercial and industrial development will then come from agricultural or forested areas.
Figure 2

Average Yearly Increase of Land Use Changes
(Slope of line shows average change)

A. Shifts to residential use
   1963-1971  18.6 Ac/yr
   1971-1974  27.6 Ac/yr

B. Shifts to commercial use (non-school)
   1963-1971  7.0 Ac/yr
   1971-1974  8.5 Ac/yr

C. Shifts to commercial use (schools)
   1963-1971  4.0 Ac/yr
   1971-1974  5.8 Ac/yr

D. Shifts to gravel pits
   1963-1971  8.3 Ac/yr
   1971-1974  12.0 Ac/yr
Agricultural and Woodland Shifts

Table 1

A. Shifts to Residential Use

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<td>Agricultural shifts</td>
<td>134.19</td>
<td>78.13</td>
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<td>Woodland and semi-woodland shifts</td>
<td>14.52</td>
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<td>Total</td>
<td>148.71</td>
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<td>231.48</td>
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B. Shifts to Commercial Use (Non-school)

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<td>56.67</td>
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<tr>
<td>Total</td>
<td>56.67</td>
<td>25.40</td>
<td>82.07</td>
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C. Shifts to Commercial Use (Schools)

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<td>Agricultural shifts</td>
<td>32.37</td>
<td>17.40</td>
<td>49.77</td>
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<td>Woodland and semi-woodland shifts</td>
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<tr>
<td>Total</td>
<td>32.37</td>
<td>17.40</td>
<td>49.77</td>
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D. Shifts to Gravel Pits

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<td>33.49</td>
<td>2.95</td>
<td>36.44</td>
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<tr>
<td>Woodland and semi-woodland shifts</td>
<td>33.27</td>
<td>33.01</td>
<td>66.28</td>
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<tr>
<td>Total</td>
<td>66.76</td>
<td>35.96</td>
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See Figure 2 for rates of change (p.7)
This increased pressure will cause agricultural lands to deplete at a faster rate; and without the zoning the depletion rate will increase even faster. It should also be noted that not all of the 3,799.05 acres of woodlands are suitable for other purposes. Much of this land is along the Willamette and Calapooia Rivers where there is annual flooding. Other areas are fairly steep, thus not well suited for agricultural or commercial development. Therefore, only part of the woodlands are readily available for conversion to other uses.

The total amount of agricultural, woodland and semi-woodland areas that shifted to other uses was 670.66 acres. Of this amount, 75.04 acres of agricultural land shifted to orchard, and 178.33 acres of semi-woodland and woodland shifted to agricultural use. This left 417.29 net acres of agricultural, woodland and semi-woodland areas that shifted to residential, commercial and industrial use during the study period.

2. Areas of Major Change

There are four areas in the township where the majority of the agricultural and woodland changes are taking place. These are:

1. Sections 32, 33 and 34 where agricultural land is shifting to commercial and light industrial use.
2. Section 25 in the area of Linn Benton Community College.
3. Sections 19 and 31 along the highway from Corvallis to Albany.
4. Sections 9, 16 and 17 along the Willamette River where the semi-woodland areas are being converted to gravel pits and agricultural land.

C. Commercial Development

1. Overview

The majority of the commercial development is taking place in
two areas of the township. These areas are Section 25, where Linn Benton Community College (LBCC) is located, and Sections 33 and 34 along the highway leading from Corvallis to the freeway. There is also some scattered development taking place in Sections 1, 19, 32 and 36, but this is primarily individual establishments and not concentrations of development. There was some scattered commercial use established prior to 1963, which was mostly schools, small retail businesses and an agricultural experiment station.

2. Commercial (Schools)

In 1963 there was a total of 55.34 acres of land in commercial use within the township. 7.94 acres, or 14.3% of the area, was used by schools located in Sections 18, 19, 22 and 36. By 1971 the amount of land occupied by schools had increased to 40.31 acres. This increase was caused by the construction of LBCC in Section 25. LBCC construction occupied 32.37 acres, for an increase of 507.70% over the 1963 school acreage. By 1974, the amount of school development had increased to 57.71 acres, again caused by LBCC, which increased by 17.40 acres to a total of 49.77 acres. From 1963 to 1974 the amount of land used for schools increased from 7.94 acres to 57.71 acres entirely as a result of the construction of LBCC (see Map 3). Unless LBCC expands further, the amount of land used for schools will probably remain constant. If the population of the area shows much increase, however, additional schools may be needed. Since the Linn County side of the township is zoned primarily UR and
SR, most growth will probably take place in that area, thus causing the schools to be built east of the Willamette River.

3. Commercial (Other than schools)

The remaining 47.40 acres of commercial use in 1963 was scattered fairly well throughout the township. The largest concentration of use was in Section 8, and consisted of a drive-in theater, radio station, gas storage area, USDA and State of Oregon agricultural experimental areas. The other commercial uses in the township were mainly gas stations, retail sales, and light industrial operations. By 1971, the total commercial usage had increased to 112.01 acres, with non-school use accounting for 71.70 acres. Most of this increase occurred in Sections 33 and 34 along the highway. By 1974 the total commercial use had grown to 137.41 acres, with non-school use accounting for 79.70 acres. This growth took place entirely in Sections 33 and 34.

Between 1963 and 1974 commercial non-school use increased from 47.40 acres to 79.70 acres, for a 59.50% increase. The majority of this growth took place in Sections 33 and 34 of Linn County, an area which is zoned primarily light industrial. Commercial growth is still increasing in Linn County, but is being confined fairly well to the zoned areas. Checks in late 1975 have shown that the area zoned light industry in Sections 33 and 34 is being developed at a fairly rapid rate, so it will not be too long before most of the agricultural land in these two sections will be converted to commercial use.
D. Residential Development

Residential development has occurred in two types of growth patterns: Single houses scattered throughout the township, and subdivisions of concentrated houses built in specific areas.

1. Single Houses

Most of the housing construction is taking place in Linn County along the primary roads. A few single houses are being built in Benton County as well, but those are located mainly in Sections 1 and 2 where the growth is beginning to form a subdivision type pattern.

In 1963 there were 401.05 acres of single houses, with the majority located in Linn County (Map 1). By 1974 the figure had risen to 448.71 acres, for an increase of 11.88 percent.

The majority of this growth also occurred in Linn County (Map 2). The zoning in these two counties is extremely important when considering the present and future growth.
patterns of the study area. Most of the Benton County portion of the township is zoned Exclusive Farm Use (EFU), with smaller areas zoned Rural Residential (RR) and Urban Residential (UR). Development in Benton County takes place almost entirely in the RR and UR zoned areas, with only an occasional house being built in the EFU zone. Since the housing development within Benton County has been confined to the RR and UR zones, encroachment on agricultural land has been kept to a minimum, thus leaving large areas available for future farm use. In Linn County most of the area is zoned Urban Residential (UR), Suburban Residential (SR) or some form of commercial or industrial zone. There are only a few areas zoned EFU, thereby leaving most of the agricultural land open for development (see Map 1). This zoning pattern has allowed most of the residential construction, both single house and subdivision, to take place on Linn County agricultural land. As can be seen on Map 3, residential construction encroachment on agricultural land has been quite serious in some areas. Taking into consideration the zoning and possible population increases, this depletion of Linn County farm land will probably continue at its present, or possibly even a faster rate.

2. Subdivision Housing

In 1963 there were subdivisions located in Sections 13, 15, 19, 22, 24, 28 and 30 (see Map 1). Many of these subdivisions consisted mostly of groups or clusters of houses along the main roads in Linn County. The larger organized subdivisions were
just beginning to develop, and the few which were already established were located in Sections 19 and 24. The combined area of organized subdivisions and housing clusters accounted for 350.77 acres of residential land use in 1963. Since that year, subdivision growth has been fairly rapid. It is especially noticeable in Sections 25 and 32 of Linn County, and in Section 19 of Benton County. Some concentrated development is taking place in Sections 1 and 2 of Benton County, but as yet does not seem to be of a totally organized nature. The existing subdivisions have also shown some increases, but not to the extent that has occurred in Sections 19, 25 and 32. By 1971 the subdivision acreage had risen to 475.56, an increase of 38.58 percent. Most of this development took place in Linn County. Growth in Section 32 accounted for 36 of the 124.79 acres of increase (see Map 2). Subdivision area by 1974 totalled 535.61 acres, for a 52.69 percent increase over the 1963 acreage. Again, most of the growth occurred in Linn County (see Map 3). It is only natural under the current zoning patterns that large residential increases in the township will occur in Linn County, for it is primarily zoned SR and UR. The subdivision development has been spread throughout the area, and seems to be replacing agricultural land at an increasing rate. In Benton County, however, subdivision type development has been zoned into only two areas, which are in Sections 1, 2 and 19 (see Map 3). Since subdivision development has been fairly well restricted to those areas, residential encroachment on farm land has been kept to a minimum.
During the 1963-1974 study period the total amount of residential housing increased from 751.82 acres to 984.32 acres, for a 30.92% increase. As a result, residential acreage now comprises about 4.5% of the total area of the township. The increases in residential acreages are shown in the following table.

Residential Housing Acreages

Table 2

|       | Benton County | | Linn County | | Total |
|-------|---------------|---|-------------|---|-------|---|
|       | Single | Sub Division | Total | Single | Sub Division | Total | Total |
| 1963  | 185.17 | 94.59 | 279.76 | 215.88 | 256.18 | 472.06 | 751.82 |
| 1971  | 196.78 | 142.46 | 339.24 | 229.21 | 333.10 | 562.31 | 901.55 |
| 1974  | 202.70 | 157.61 | 360.31 | 246.01 | 378.00 | 624.01 | 984.32 |

E. Gravel Pits

1. Locations

The gravel pits in the township are located in Sections 2, 9, 11, 16, 17, 20 and 28, with the primary concentrations in Sections 9, 16, 17 and 28 (see Map 3). The gravel pits lie within the confines of the old Willamette River beds, which cover an area roughly two miles wide, and extend from the southwest corner to the northeast corner of the township. Because the river meanders, approximately one-third of the township has gravel deposits that are fairly accessible for exploitation.
2. Amount Gained

There are currently eleven gravel pits that show up as being active or recently active. This does not include some gravel bar areas that may be operated during times of low water or on a periodic basis. During the study period the number of gravel pits, excluding the seasonal ones on gravel bars, increased from seven to eleven, which does not seem extremely great until the acreage gain is taken into account. In 1963 there were about 52.65 acres of gravel pits. This increased to 147.36 acres in 1971, and to 178.32 acres by 1974, which is a gain of 125.67 acres, or an increase of 339 percent in eleven years. Most of the growth took place in Benton County. The areas currently used as gravel pits are in agricultural, semi-woodland and non-productive lands. These areas are all in EFU and SR zoned locations, but a gravel pit is a conditional use in both zones, so continued use and expansion of the gravel pits will not be restricted too much by the zoning designations. Since the gravel pits are in agricultural and wooded areas, any expansion of the pits would result in additional agricultural acreage being lost to farm use. With the current rate of growth, or an increase in growth, such as might occur with the Hewlett Packard construction, the amount of agricultural lands shifting to gravel pits will probably increase in the future.

F. Orchards

1. Locations

Orchards are located in both Benton and Linn Counties, with
about two-thirds of the acreage found in Benton County. These acreages are in Sections 1, 2, 7, 11, 17, 19, 20 and 30, with the largest percentage in Sections 1, 11 and 20.

2. Increases

The acreage of orchards has increased from 154.70 in 1963 to 229.74 acres in 1971, for an increase of 48.51 percent. There was no noticeable increase between 1971 and 1974. The entire growth occurred in Benton County in Sections 17, 19 and 30 (see Map 2). The largest increase occurred in Section 17 where 59.58 acres of woodland and agricultural land were shifted to orchards. There was also a loss of at least 4.15 acres of orchard between 1963 and 1971. This was located in Section 1 where residential development is gradually taking over the remnants of some old orchards.

G. Area Lost to Primary Roads and Railroads

A land use that has not yet been discussed is the amount that is used for railroad and highway right of ways. This use is important, but for ease in calculating the classification types, the land taken up by highways and railroads was excluded. There are approximately 13.30 miles of railroads and 51.25 miles of paved primary two and four lane highways in the township. These figures do not include gravel roads or some of the minor paved ones. The roads that are included are the ones that were readily identifiable on the aerial photos. The 13.30 miles of railroad right of way cover approximately 45 acres, and the highways use an additional 274 acres, for a total of 319 acres. This amount
is 1.47 percent of the entire land area involved in the study. There could easily be another 100 acres of land taken up by gravel or paved roads, thus making the roaded area equal about two percent of the township.

H. County Zoning

The zoning of the township has been briefly discussed in various sections of the report. The zoning designations and lot sizes for the two counties are contained in the appendix. This section will provide a brief summary of the zoning in the township. As seen on Map 1, Linn County is primarily zoned residential and industrial, with selected areas of EFU. The Benton County side of the township is zoned mostly EFU with selected areas of residential development. The effect of this zoning difference shows up when the three overlays are viewed without the base map (see Map 4). The majority of the development is taking place in Linn County, while in Benton County development is being restricted to certain areas zoned for residential development. If this building trend continues, the Linn County portion of the township will gradually be pocketed with residential and commercial developments. This pocketing will probably make agricultural use extremely difficult, if not impossible, in future years.
Land Use Classifications

Woodland - Areas with ground cover consisting primarily of trees, and a crown closure that is generally over 50 percent.

Semi-woodland - Areas of grass, brush, and woodland mixtures where the grass and brush combination is the predominate ground cover. Tree crown closure is generally less than 50 percent.

Water - Rivers, streams, and lakes. Ponds formed by gravel pits are included in the light industry classification.

Powerline R/W - Areas cleared for powerlines. The area under the powerline may be used for agricultural purposes, but are designated on the map as powerlines.

Agricultural land - Pasture, row crops, grain or open fields that might be used for agricultural purposes. Excludes orchards.

Orchards - An area of cultivated trees bearing a fruit or nut crop.

Residential (Single house) - An individual house, or a house with small outbuildings such as a garage, storage shed or pump house.

Residential (subdivision) - An area with two or more houses that are adjacent or in close proximity to each other. The actual size of the subdivision is equivalent to the area covered on the map.

Commercial (light industry) - Wholesale and retail sales, drive-in theaters, light manufacturing, public buildings (excluding schools), service stations, radio stations, storage areas, substations.

Commercial (schools) - Includes primary and secondary schools, community colleges and universities.

Industrial (gravel pit) - Surface mineral excavation and related operations.

Non-productive land - River banks, sand and gravel bars, and other areas where the land is generally not suitable for woodland and agricultural use. This does not preclude the future use of extracting surface or sub-surface mineral resources.
Zoning Designation - Linn County

S.R. - Suburban Residential

Uses Permitted Outright

Limited animal husbandry; farm use and management and harvesting of timber products; residential use (including individual mobile homes); home occupations; public parks, playgrounds, and community centers.

Conditional Uses Permitted

Limited animal husbandry; airports, with commercial spraying operations; cemeteries; day nurseries; nursing homes; mobile home parks; multiple-family dwellings; private recreation; quarrying; solid waste disposal sites.

Minimum Lot Size (Unless otherwise prescribed by sub-district)

1 acre - without public water
½ acre - with public water or sewer

U.R. - Urbanizing Single-Family Residential

Uses Permitted Outright

Single-family dwelling, excluding mobile homes; accessory buildings and structures; other uses permitted outright in the S.R. District; governmental parks; playgrounds and community centers.

Conditional Uses Permitted

Cemeteries; day nurseries; nursing homes; mobile home parks; private golf courses; public or semi-public buildings or structures; solid waste disposal sites; quarrying.

Minimum Lot Size (Unless otherwise prescribed by sub-districts)

1 acre - without public water or sewer
½ acre - with public water or sewer
With public water and sewer:
  10,000 sq. ft. ½ a.
  9,000 sq. ft.
  8,000 sq. ft.
  7,000 sq. ft.
  6,000 sq. ft.

UMF - Urbanizing Multiple Family Residential
Uses Permitted Outright

Multiple-family dwellings (three or more on one lot shall be provided with a sewer system) uses allowed outright in the UR District.

Conditional Uses Permitted

Conditional uses allowed in the UR District.

Minimum Lot Size (Unless otherwise prescribed by sub-district)

1 acre without public water and sewer
½ acre with public water and sewer
6,000 sq. ft. with both public water and sewer

UHC - Urbanizing Highway Commercial
Uses Permitted Outright

Selected amusement; professional service; retail sales and maintenance enterprises which are compatible with large volumes of traffic and commercial strip developments.

Conditional Uses Permitted

Bus terminals; drive-in theaters; driving ranges, and other "open" commercial recreation uses; mobile home or trailer parks; public or semi-public buildings and uses; solid waste disposal sites; conversion of single-family dwellings to commercial use; truck service station centers; veterinary clinics; other uses of similar character as may be determined by the planning commission.
Minimum Lot Size (Unless otherwise prescribed by subdistrict)

1 acre without public water and sewer
½ acre with public water and sewer
10,000 sq. ft. with both public water and sewer.

UGI - Urbanizing General Industry

Uses Permitted Outright

Selected light and medium intensity manufacturing and heavy semi-commercial uses applied to partially developed industrial areas near existing urbanizing centers.

Conditional Uses Permitted

Drive-in theaters; kennels; manufacturing; compounding, processing, etc. of selected food and beverage products; quarrying; sawmills; planing mills; solid waste disposal sites; auto or building wrecking yards.

Minimum Lot Size (Unless otherwise prescribed by subdistrict)

1 acre without public water and sewer
½ acre with either public water or sewer
10,000 sq. ft. with both public water and sewer.

LI - Limited Industrial

Uses Permitted Outright

Selected light industries generally not requiring full urban services.

Conditional Uses Permitted

Drive-in theaters; driving ranges or other open recreational uses; mobile home or trailer parks; solid waste disposal sites; conversion of existing residences into commercial or industrial structures; truck service station centers (heavy repair); storage of combustible liquid or explosives.
Minimum Lot Size (Unless otherwise prescribed by subdistrict)

1 acre without public water and sewer
½ acre with either public water or sewer
10,000 sq. ft. with both public water and sewer.

IFF - Interim Farm-Forest
Uses Permitted Outright
Residential and non-residential uses allowed in the ART district.

Conditional Uses Permitted
Conditional uses allowed in the ART District.

Minimum Lot Size (Unless otherwise prescribed by subdistrict)

20 acres

EFU - Exclusive Farm Use
Uses Permitted Outright
Farm use; buildings, other than dwellings, customarily provided in conjunction with farm uses; one single-family dwelling or mobile home for any lot of 40 acres or more, where such dwelling or home is in conjunction with farm use; propagation or harvesting of a forest product; public or private schools; churches; utility facility necessary for public service, except commercial facilities for the purpose of generating power for public use by sale.

Conditional Uses Permitted
Commercial activities that are in conjunction with farm use; quarrying; private parks, playgrounds, hunting and fishing preserves and campgrounds; parks, playgrounds or community centers owned and operated by a governmental agency or a nonprofit community organization; golf courses; commercial utility facilities; accessory dwellings or mobile homes for the use of persons assisting in carrying out the farm use on the property including farm labor camps; single-family dwellings or mobile homes not provided in conjunction with farm use.
Minimum Lot Size (Unless otherwise prescribed by subdistrict)

1 acre without public water and sewer
½ acre with either public water or sewer
10,000 sq. ft. with both public water and sewer.

EFU - Exclusive Farm Use

Uses Permitted Outright

Farm use; buildings, other than dwellings, customarily provided in conjunction with farm uses; one single-family dwelling or mobile home for any lot of 40 acres or more, where such dwelling or home is in conjunction with farm use; propagation or harvesting of a forest product; public or private schools; churches; utility facility necessary for public service, except commercial facilities for the purpose of generating power for public use by sale.

Conditional Uses Permitted

Commercial activities that are in conjunction with farm use; quarrying; private parks, playgrounds, hunting and fishing preserves and campgrounds; parks, playgrounds or community centers owned and operated by a governmental agency or a nonprofit community organization; golf courses; commercial utility facilities; accessory dwellings or mobile homes for the use of persons assisting in carrying out the farm use on the property including farm labor camps; single-family dwellings or mobile homes not provided in conjunction with farm use.

ART - Agriculture Residential and Timber Use District

Uses Permitted Outright

General farming; limited animal husbandry; public recreation; management and harvesting of forest products; residential use (including mobile homes); home occupations; limited sale of agricultural products grown on premises; dwelling units in conjunction with agricultural or forestry use.

Conditional Uses Permitted

Airport; cemetery; kennel; mobile home park; gravel pit; surface and subsurface mining; private recreational use; multiple use recreational development; radio or TV station,
transmitter or tower; solid waste disposal site; veterinary clinic; limited animal husbandry and agricultural related uses; campgrounds; day nurseries; nursing homes; public and semi-public buildings and uses; sale of agricultural products grown on premises (sales are not exceeding 200 sq. ft.); temporary sawmills.

Minimum Lot Size (Unless otherwise prescribed by subdistricts)

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(6)
Zoning Designations - Benton County

RR - Rural Residential

Permitted Uses

1. Management, production, and harvesting of agricultural and/or forestry products.
2. One single-family dwelling, one two-family dwelling, or one mobile home per lot.
3. Additional structure, dwelling unit, or mobile home for employers or employees or other uses directly required for the management, production, or harvesting of agricultural or forestry products.

Conditional Uses

1. Park or recreational facility, greenway corridor acquisition, and bike paths.
2. Public wildlife preserve.
3. Dam, power plant, transmission line, transmission station, together with associated structures.
4. Water supply, water treatment facility, or waste treatment facility.
5. Operations conducted for the exploration, mining, and processing of geothermal resources as defined by ORS 522-010(4), aggregate and other mineral resources or other subsurface resources.
6. Private air strip.
7. Church, grange hall, community hall, or other nonprofit facility rendering a public service to the community.
8. Solid waste disposal conducted under the sanitary landfill or other landfill method (subject to the provisions of Oregon statute).
9. Cemetery
10. A change of minimum lot area indicated by the suffix number as outlined in section 2.02 (2) of this ordinance.
11. Planned development.
12. Open space as defined under ORS 308.740 and 308.745.

Lot Area Requirements

The minimum area of any lot located in the rural residential district shall be designated by the suffix number indicated on the official Zone Map of the county. The lot area requirements shall vary from a minimum of one (1) acre to ten (10) acres....
UR - Urban Residential

Permitted Uses:

1. Management, production, and harvesting of agricultural and/or forestry products including nurseries, except for keeping, breeding, or raising of animals primarily for fur-bearing or feedlot purposes.
2. One single-family dwelling per lot.
3. Church, grange hall, community hall, or other similar nonprofit facility rendering a public service to the community.
4. Public utilities which are aesthetically compatible.
5. Accessory use and building customarily incidental to the above uses.

Conditional Uses:

1. Park or recreational facility, greenway corridor acquisition, and bike paths.
2. Dam, power plant, transmission line, transmission station, together with associated structures.
3. Water supply, water treatment facility, or waste treatment facility.
4. Operations conducted for the exploration, mining and processing of geothermal resources as defined by ORS 522.010 (4), aggregate and other mineral resources or other subsurface resources.
5. Solid waste disposal, including pickup and transfer centers, conducted under the sanitary landfill or any other landfill method (subject to the provisions of Oregon statute).
6. Cemetery.
7. Mobile home or mobile home park.
8. Retirement center or child day-care center.
9. A change of lot area minimum and corresponding suffix number as outlined in section 2.02(2) of this ordinance.
10. Planned development.
11. Dwelling, two-family, per lot.
12. Open space as defined under ORS 308.740 and 308.745.

Lot Area Requirements:

Example: RU-0 10,000 Square feet minimum lot size
         RU-½ One-half acre minimum lot size
         RU-1 One acre minimum lot size
         RU-2 Two acre minimum lot size
         RU-3 Three acre minimum lot size
         RU-5 Five acre minimum lot size
EFU - Exclusive Farm Use District

Permitted Uses

1. Farm use (as defined in ORS 215.203).
2. The propagation or harvesting of a forestry product.
3. Utility facilities necessary for public service, except commercial facilities for the purpose of generating power for public use by sale.
4. The dwellings and other buildings customarily provided in conjunction with farm use, referred to in ORS 215.203(2)(a).

Conditional Uses

1. Commercial activities that are in conjunction with farm use.
2. Operations conducted for the exploration, mining and processing of geothermal resources as defined by ORS 522.010(4), aggregate and other mineral resources or subsurface resources.
3. Private parks, playgrounds, hunting and fishing preserves, and campgrounds.
4. Parks, playgrounds or community centers owned and operated by a governmental agency or a non-profit community organization; greenway corridor acquisition and bike paths.
5. Golf courses.
6. Commercial utility facilities for the purpose of generating power for public use by sale.
7. Single-family residential dwellings, public or private schools, and churches, not provided in conjunction with farm use, upon a finding that each such proposed dwelling:
   a. is compatible with farm uses described in ORS 215.203(2) and is consistent with the intent and purpose set forth in this article and ORS Ch. 215 and
   b. does not interfere seriously with accepted farming practices, as defined in ORS 215.203(2)(c), on adjacent lands devoted to farm use; and
   c. does not materially alter the stability of the overall land-use pattern of the area; and
   d. is situated upon generally unsuitable land for the production of farm crops and livestock, considering the terrain, adverse soil or land conditions, drainage and flooding, vegetation, location and size of the tracts; and
   e. complies with such other conditions as the Planning Commission considers necessary.
8. Lot area of less than forty (40) acres, provided such lot size is in conformity with the intent of this article and ORS Ch. 215.
9. Open space as defined under ORS 308.740 and 308.745.

Lot Area Requirements

Minimum lot area of any lot located in the Exclusive Farm Use District shall be forty (40) acres.
FP-A - Flood Plain - Agricultural District

Permitted Uses

1. Management, production, and harvesting of agricultural and/or forestry products.

Conditional Uses

1. One single-family dwelling or mobile home when it has been demonstrated that the health, safety, and welfare of future occupants is not threatened by recurring floods. Lot area requirements and setback requirements shall be established by the Planning Commission on an individual basis at the time a conditional use approval is given.
2. Public wildlife preserve.
3. Dam, power plant, transmission line, transmission station, together with associated structures.
4. Water supply, water treatment facility, or waste treatment facility.
5. Operations conducted for the exploration, mining, and processing of geothermal resources as defined by ORS 522.010 (4), aggregate and other mineral resources or other subsurface resources.
6. Solid waste conducted under the sanitary landfill or other landfill method (subject to the provisions of Oregon statute).
7. Park or recreation facility, greenway corridor acquisition and bike paths.
8. Open space as defined under ORS 308.740 and 308.745. (3)
Map 1

1963 Base Map and Zoning

-31-
Map 2

1963 Base Map, 1971 Change and Zoning
LAND CLASSIFICATION BASE MAP

T. 11S. R. 4 W.

W. M.

1971 1963 1974

ZONING 1975

LEGEND

TWO LANE ROAD
FOUR LANE ROAD
RAILROAD
RESIDENTIAL - SINGLE HOUSE
RESIDENTIAL - SUBDIVISION
COMMERCIAL - LIGHT INDUSTRY
COMMERCIAL - SCHOOL
INDUSTRIAL - GRAVEL PIT
WOODLAND
SEMI-WOODLAND
ORCHARD
Agricultural Land
Nonproductive Land
WATER
POWERLINE R/W

DATUM

TOWNSHIP OUTLINE WAS TAKEN FROM U.S. GEOLOGICAL SURVEY 7.5-MINUTE QUADRANGLE MAPS.
1963 BASE MAP, block 1971 CHANGE, 1974 CHANGE AND ZONING

SCALE: 3 INCHES = 1 MILE

Map 3

1963 Base Map, 1971 Change, 1974 Change and Zoning

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1971-1974 GAIN-LOSS ACREAGES
### Table 8

**Land Use Change Summary**

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<th>1963</th>
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<th>1974</th>
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BIBLIOGRAPHY


3. Benton County Zoning District Designations, Benton County Planning Department, Corvallis, Oregon.


6. Linn County Zoning Ordinances, Summary of Use Districts, Linn County, Oregon.