BENTON COUNTY

COMPREHENSIVE
LAND USE
PLAN

Board of County Commissioners
BENTON COUNTY
P.O. Box 190 Phone (509) 786-4278 or 545-2496 Prosser, Washington 99350

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July 1, 1985

CITIZENS OF BENTON COUNTY
OTHER INTERESTED READERS

We are pleased to submit, as adopted by Resolution nos. 84-270 and 84-417, the results of several years of work by various groups of local residents, local and state agencies, the Benton County Planning Commission, and the Benton County Planning Department to update the county's comprehensive plan.

This comprehensive plan document not only defines official county policy with regard to physical development, it also serves as a representative statement of the public interest. All ordinances and planning programs will be guided by and brought into conformance with this plan.

Special credit must go to the local residents who contributed many hours of time at citizen advisory meetings and workshops in preparing much of the comprehensive plan provisions found herein. Benton County especially owes these dedicated people a sincere vote of appreciation.

Thank you for your interest and participation in this effort.

Sincerely,

W H Sebero
Chairman of the Board

Member

Member

Constituting the Board of County Commissioners of Benton County, Washington.

ACKNOWLEDGEMENTS

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BENTON COUNTY

COMPREHENSIVE LAND USE PLAN

ERRATA SHEET

On page 149, under Land Use Map Classifications, the "139-144" in the second line of the first paragraph should be 167-172.

On page 168, the Land Use Plan for PROSSER-ROZA, map 42, the left "Range 25 East, W.M." should be Range 24 East, W.M.

The land use maps on pages 167-172 are a reduction from the original land use maps and are considered generalized at this scale. For more specific detail and for designations within the county, please see the display maps on file at Benton County Planning Department, Prosser, Washington.

On page 168, the Land Use Plan for PROSSER-ROZA, map 42, the white land use classification in Section 6, Township 9 North, Range 25 East, W.M. should be classified as public.

On page 119, the Irrigation Districts, map 33, should indicate Benton Irrigation District and Kiona Irrigation District around Benton City, Washington, rather than Sunnyside Valley Irrigation District. On map 33, it should read Sunnyside Valley Irrigation District rather than Sunnyside Irrigation District.

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CHAPTER I

INTRODUCTION

INTRODUCTION

PLAN PURPOSE AND SCOPE

A responsibility of county government in the State of Washington is to provide the long-range leadership, goals, and policies for the sound development of the county. This is accomplished primarily through the development and maintenance of a long-range comprehensive plan.

This Comprehensive Plan is designed for a long-range planning period of approximately 20 years. It provides a framework for County decisions, and provides citizens with a document that explains long-range public policy so that they can make informed individual planning decisions with some assurance that there will be reasonable continuity in the County's goals, policies, and planning process over an extended period of time. The Plan enables County citizens and decision makers to take a comprehensive look at the direction in which the County is heading, and provides a means by which the County can influence its own long-range destiny.

It should be noted that the land use portions of the Comprehensive Plan cover only unincorporated area. Land use planning jurisdiction within city limits comes under the purview of the respective cities.

To a limited extent, this Plan is a revision of the Comprehensive Plan which was adopted in 1967. It should be noted however that the 1967 Plan basically only covered the unincorporated areas surrounding the cities of Prosser, Benton City, and Kennewick. It was not in actuality a comprehensive county plan in any realistic sense of the term. In addition, as noted on page [illegible]e of the 1967 Plan, the major source of the background data for that Plan was the Economic Base Study which was completed for Benton County in 1963. In judging the current adequacy of the 1967 Plan, it is helpful to realize that the Plan has never been amended or updated since its adoption. Thus Benton County is today faced with a situation of being one of the fastest growing counties in the nation, while its most important tool for dealing with that growth covers less than five percent of the County area, is based upon data that is approximately 20 years old, and has never been revised to reflect changes that have occurred during that period. The need for a complete revision of the 1967 Plan is self-evident.

PLAN FORMAT

The Plan consists of 13 chapters, nine of which are standard Comprehensive Plan "Elements" (Transportation, Housing, etc.). Each Element covers a separate topic area. Most of the Elements consist of two major parts: (1) a background information section, and (2) an analysis of the long-range needs of the subject area. The Land Use Element is somewhat unique in that the Land Use Plan Maps are in essence major policy statements.

The relationship between the Plan goals, policies, and recommendations and the Plan Elements is a very direct one. The Elements contain the background information, including data and maps, that provided the basis for the development and/or refinement of many of the Plan goals, policies and recommendations. For example, the written policies address such topics as areas subject to natural disasters and hazards, while the Physical Element includes maps and text describing the location and nature of these factors. The Plan Elements also serve the following purposes:

1. They provide long-range need estimates which serve as basic parameters and general guides to assist in the plan development and refinement process.

2. They provide pertinent information to aid the understanding of the forces that shape the development of the County.

3. They will provide later planners and decision makers with the kind of information that will be useful in the development and adoption of refinement plans or in review and revision of the County Comprehensive Plan.

DEFINITION OF TERMS

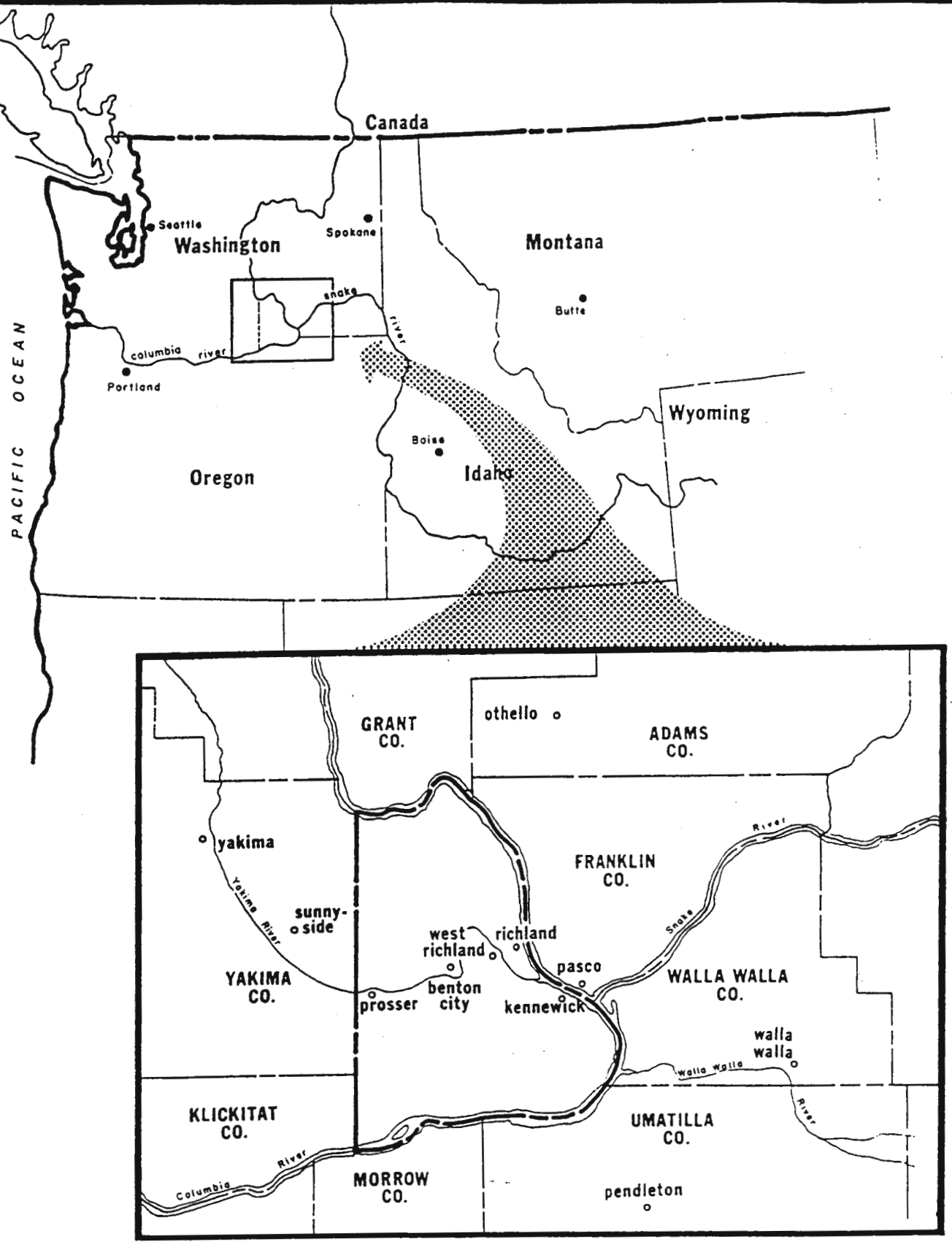
It is important that the major terms utilized in the Plan be understood. The three major terms are goals, policies, and recommendations.

Goals are broad statements of intent and philosophy expressing countywide values and attitudes. Goals are used as a general guide for action by the County. A goal may never be completely attainable but is used as a point to strive for.

Policies are decision making guidelines which provide the basis for specific courses of action to move the County toward attainment of the adopted goals. Policies have a strong effect on a

Benton County Comprehensive Plan

Benton County Location



MAP 1

county because county decisions and programs should not contradict adopted county policies. A policy is the official position of Benton County.

Due to budgetary and other constraints, complete implementation of all adopted policies may not be possible at any given time. When decisions are being made to which adopted Plan policies are applicable, the policies should be followed unless it can be shown that a different decision better supports the particular goals involved.

Recommendations are implementation measures which need to be undertaken in order to accomplish the Plan policies. They provide County decision makers with a range of options for implementing the Plan and help to clarify the intent of Plan policies. Listing of a recommendation does not obligate the County to employ that recommendation. Recommendations are to be considered as guidelines only and are not binding by law.

RELATIONSHIP OF THE PLAN TO STATE PLANNING LAW

The statutory authority for county planning in the State of Washington is established by the Planning Enabling Act of 1959 as amended and as codified in Chapter 36.70 of the Revised Code of Washington.

In general terms, the purpose and intent of the Enabling Act is to:

> "provide the authority for, and the procedures to be followed in, guiding and regulating the physical development of a county or region through correlating both public and private projects and coordinating their execution with respect to all subject matters utilized in developing and servicing land, all to the end of assuring the highest standards of environment for living, and the operation of commerce, industry, agriculture and recreation, and assuring maximum economics and conserving the highest degree of public health, safety, morals and welfare (RCW 36.70.010)."

This Comprehensive Plan is in conformance with the statute's definition of a comprehensive plan which is as follows:

> " 'Comprehensive Plan' means the policies and proposals approved and recommended by the planning agency or initiated by the board and approved by motion by the board (a) as a beginning step in planning for the physical development of the county; (b) as the means for coordinating county programs and services; (c) as a source of reference to aid in developing, correlating, and coordinating official regulations and controls; and (d) as a means for promoting the general welfare. Such plan shall consist of the required elements set forth in RCW 36.70.330 and may also include the optional elements set forth in RCW 36.70.350 which shall serve as a policy guide for the subsequent public and private development and official controls so as to present all proposed developments in a balanced and orderly relationship to existing physical features and governmental functions (36.70.020(6)".

The Enabling Act goes on to require that comprehensive plans include at least land use and circulation elements. Counties are authorized to include as many additional elements as may be desired.

Basically, if a county chooses to exercise land use planning authority as provided for by the Planning Enabling Act, as Benton County chose to do in 1967 through the adoption of County Ordinance No. 86, then by the provisions of that Act the County is required to develop and adopt a comprehensive plan.

This Comprehensive Plan has been developed so as to adhere to State planning law. At the same time, however, the legislative authorization has been viewed not as a restrictive requirement, but rather as an opportunity for the County to identify the goals and desires of the citizens of Benton County for the long-range destiny of their County, and as an opportunity to develop a document that reflects those goals and desires and that provides a means for their realization.

RELATIONSHIP OF THE PLAN TO ZONING AND OTHER "OFFICIAL CONTROLS"

The relationship of the Comprehensive Plan to zoning and other official controls is stated succinctly by the Planning Enabling Act's definition of and authorization for development of official controls by a county. The pertinent statutes read as follows:

> "'Official controls' means legislatively defined and enacted policies, standards, precise detailed maps and other criteria, all of which control the physical development of a county or any part thereof or any detail thereof, and are the means of translating into regulations and ordinances all or any part of the general objectives of the comprehensive

plan. Such official controls may include, but are not limited to, ordinances establishing zoning, subdivision control, platting, and adoption of detailed maps." (RCW 36.70.020(11)) (Underlining added)

"From time to time, the planning agency may, or if so requested by the board shall, cause to be prepared official controls which, when adopted by ordinance by the board, will further the objectives and goals of the comprehensive plan. The planning agency may also draft such regulations, programs and legislation as may, in its judgement, be required to preserve the integrity of the comprehensive plan and assure its systematic execution, and the planning agency may recommend such plans , regulations, programs and legislation to the board for adoption." (RCW 36.70.550). (Underlining added)

In addition, the Enabling Act states that "Zoning maps as an official control may be adopted only for areas covered by a comprehensive plan containing not less than a land use element and a circulation element." (RCW 36.70.720)

These statutory citations serve to clarify the relationship between a comprehensive plan and a zoning ordinance. Simply put, a zoning ordinance (and other controls) is intended to implement the comprehensive plan. Upon passage of a comprehensive plan, a county assumes a responsibility to effectuate that plan and to conform the zoning ordinance and other implementing tools to it.

Clearly, the enactment of a zoning ordinance is an important step in implementing the comprehensive plan. The zoning ordinance is a means of plan implementation which regulates the use of land by dividing a county into residential, commercial, industrial, and other zoning districts. It establishes uniform regulations within each district as to use, building height, lot size, building setbacks, and other similar requirements. In short, the zoning ordinance is a specific, detailed piece of legislation which carries out the more general goals and policies of the Comprehensive Plan.

CHRONOLOGY OF PLANNING IN BENTON COUNTY

1935 - Washington's first planning enabling statute, "The Planning Commission Act", passed.

1938 - Benton County Planning Commission established.

1946 - First Benton County Zoning Ordinance adopted.

1959 - Planning Enabling Act passed by State Legislature.

1961 - Benton Regional Planning Commission established.

1965 - Comprehensive Plans for the Urbanizing Areas of Benton County, Washington prepared by the Benton Regional Planning Commission.

1966 - Benton-Franklin Governmental Conference established.

1967 - Benton County Board of Adjustment established. County Comprehensive Plan adopted.

1976 - Decision made to update 1967 Comprehensive Plan.

1977 - Planning staff hired to prepare Comprehensive Plan. County divided into six citizen advisory committee planning areas. Citizen steering committees established in each area. Over 50 citizen involvement meetings held with these groups to formulate the Plan framework including goals and policies.

1978 - Complete resource inventory and mapping of the County conducted.

1979 - Citizen advisory committees reactivated. Over 40 citizen workshops held to evaluate the results of the resource inventory. Over 1500 citizen attitude surveys mailed out to strengthen the Draft Plan's responsiveness to citizen concerns. Meetings held with cities and other public and semi-public agencies to ensure Plan coordination. County Planning Commission meetings held throughout the year to provide framework and guidelines for Plan development process.

1980 - Preliminary Draft Comprehensive Plan completed and printed. Public hearings held in each of the six citizen advisory committee planning areas on the Draft Plan. Planning Commission workshop sessions held to evaluate public hearings results. Draft Environmental Impact Statement on Draft Plan completed and distributed. Public hearing held on Draft E.I.S.

1981 - Final E.I.S. on Draft Plan completed and distributed. Draft Plan background elements revised.

1982 - Final series of public hearings on the Draft Plan held by Planning Commission. Final revisions made in preparation for approval of Draft Plan and recommendation to the Board of County Commissioners for adoption.

1983 - Board of County Commissioners public hearings on the draft plan held. Revisions made to the draft plan and then transmitted back to the Planning Commission for final consideration.

As can be seen by the above, an extensive and thorough program has been devoted to producing the best Comprehensive Plan possible. The keystone of this process has been citizen involvement which is described more thoroughly below.

CITIZEN INVOLVEMENT

As mentioned, citizen involvement has been the keystone of Benton County's plan development process. This arrangement has been established and adhered to in order to ensure that the planning decisions made reflect the goals and desires of the people of the County. This has been the case from the very beginning of the process in 1977 when citizen steering committees were established to develop goals and policies, through the second series of more than forty (40) meetings with the citizen advisory committees to evaluate the results of the staff resource inventory in 1979, and continuing through the Countywide public hearing process that has accompanied the more formal adoption stages of the process.

The Planning Commission and Planning Department staff have continually sought out new and innovative ways to provide for citizen involvement throughout all stages of the planning process. An example was the distribution of over 1500 citizen attitude surveys in 1979.

Availability of information to the public has been an important aspect of the citizen involvement process. At all public hearings and meetings, whenever possible, copies of the reports or proposals being discussed have been made available to both the public and the press. In addition, all reports were distributed to the press as soon as they were available for release to ensure the widest possible dissemination of information to the public. As an example of this policy, over 700 copies of the Preliminary Draft Comprehensive Plan have been distributed.

A special effort has been made to ensure that all interested citizens were aware of public meetings and hearings. As a matter of course, all such meetings and hearings are announced according to legal notice requirements, but in addition to that, a strenuous effort has been made through the use of all available media to get as wide a dissemination of meeting announcements as was possible. The successful result has been meetings and hearings that have been well attended by citizens of the County.

Over the long-range planning period, the quality and effectiveness of the County's comprehensive planning efforts will be heavily dependent upon a continued commitment to an active citizen involvement program. Plan implementation, review, and amendment are all elements of the County's comprehensive planning process that will need to include citizen involvement as an integral part of that process.

In summary, the County has a history of intensive efforts designed to maximize active citizen involvement throughout the planning process. This commitment is an ongoing one and will continue throughout the long-range planning period.

COMPREHENSIVE PLAN DEVELOPMENT AND ADOPTION PROCESS

The following description and outline of the development and adoption process for the Benton County Comprehensive Plan is presented in order to provide for a better understanding of that process.

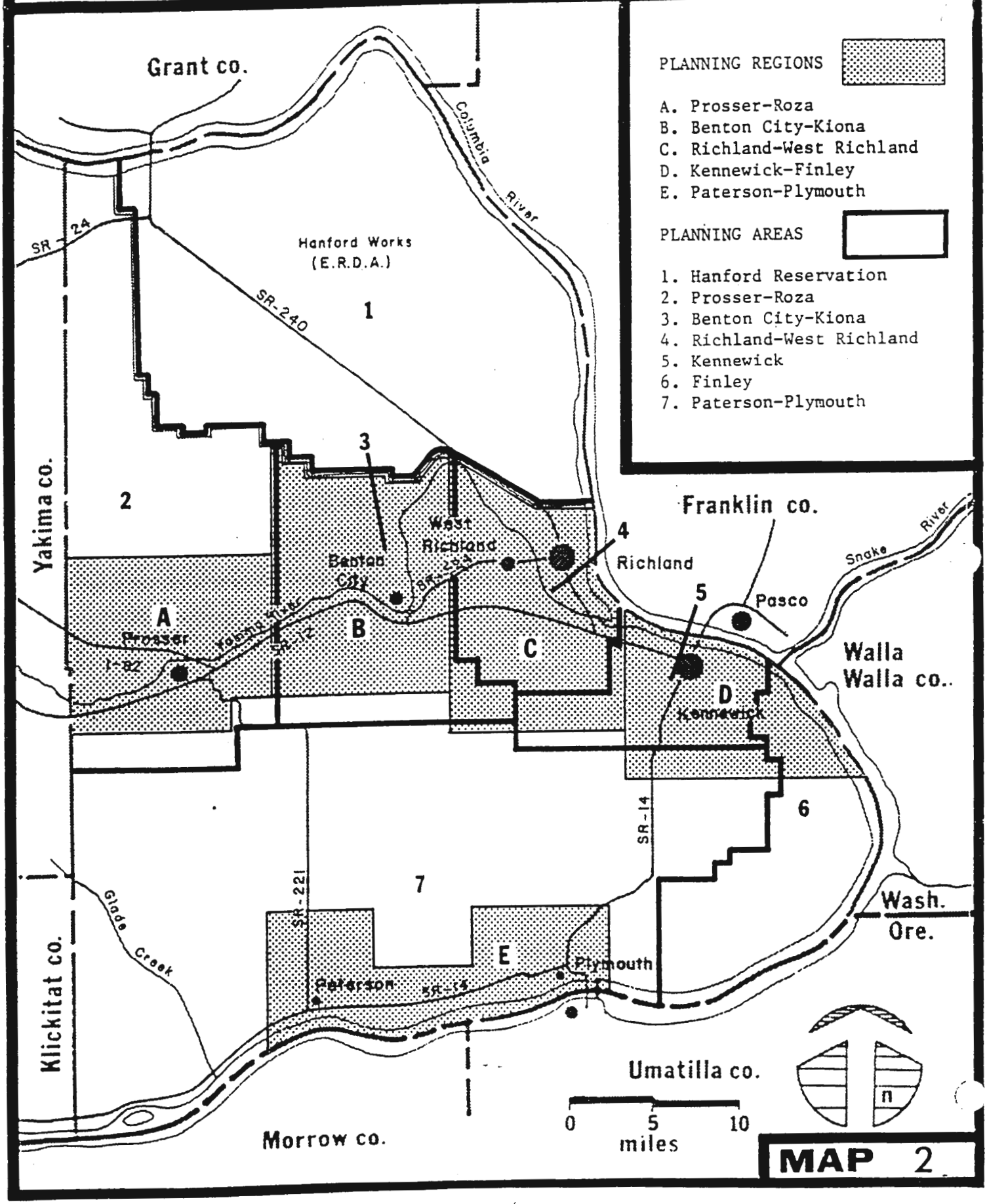
The first step in the process was the establishment of six citizen advisory committees, representing the seven different planning areas that the County had been divided into. (No committee for Hanford Area - See Map 2.) The citizens on these committees developed the Plan framework including goals and policies. These committees held over 50 meetings during 1977 to establish these guidelines.

Following the development of the Plan framework, Planning Department staff conducted a complete resource inventory of the County. This activity included such tasks as the identification and mapping of the County's existing housing stock, agricultural soils, existing land uses, natural hazard areas, soils with construction limitations, etc.

Following the completion of the resource inventory, the results and findings of the inventory were reported back to the citizen advisory committees for refinement and integration of the

Benton County Comprehensive Plan

Planning Areas and Regions



goals and policies with those findings. Over 40 citizen meetings were held during 1979 to evaluate the results of the resource inventory and to ensure that those results and the goals and policies would lead to a consistent and coordinated comprehensive plan. Also during 1979 over 1500 citizen attitude surveys were mailed out in order to strengthen the emerging Draft Plan's responsiveness to citizen concerns. Meetings and communications with affected agencies such as the County's cities were conducted in order to coordinate Plan provisions with the plans and policies of other agencies to the extent feasible.

The preliminary Draft Comprehensive Plan was completed and printed in March, 1980. Public hearings on the document were held in each of the six citizen advisory committee planning areas. County Planning Commission workshops were held to evaluate the results of the public hearings and to identify needed refinements.

In August, 1980 a Draft Environmental Impact Statement on the Preliminary Draft Plan was completed and distributed. In September of that year a public hearing was held on the Draft E.I.S., and in March, 1981, the Final E.I.S. was completed and distributed.

During 1981 the Draft Plan was revised to incorporate changes that evolved out of the public hearings and workshops and to include background elements (Housing, Population, Public Facilities and Services, etc.). The resulting revised Draft Plan was reviewed by the Planning Commission in a series of workshop sessions. Following these review sessions, the Planning Commission held additional public hearings on the revised draft. The Planning Commission then held final review workshops to decide upon any final changes to be made in the Draft Comprehensive Plan prior to forwarding the document to the Board of County Commissioners. Having made any final changes that it deems necessary, the next step is for the Planning Commission to approve the Draft Comprehensive Plan and forward and recommend it to the Board of Commissioners for adoption.

Having received the recommended Draft Plan from the Planning Commission, the Board of Commissioners will hold workshops to review the Draft Comprehensive Plan as recommended by the Planning Commission.

Following its review of the Draft Plan, the Board of Commissioners will hold public hearings in order to provide further opportunity for citizen input.

After holding public hearings, the Board of County Commissioners has two options. If it intends to adopt the Comprehensive Plan as recommended by the Planning Commission, the adoption process can be completed simply by adoption of the Comprehensive Plan by the Board of Commissioners. If the Board wishes to incorporate substantive changes however, the Draft Plan must be referred back to the Planning Commission for a final public hearing and final recommendations by the Planning Commission. The Board of Commissioners can then adopt the Comprehensive Plan.

Once adopted, the Comprehensive Plan should undergo a major revision every five years in order to keep the Plan up to date and to maintain its effectiveness in providing guidance for the County's growth and development over time. In addition, there are specific procedures for amending the Comprehensive Plan after it has been adopted. These factors are described in Chapter XIII, "Review and Amendment Procedures".

Figure 1 provides a graphic presentation of this comprehensive planning process.

BENTON COUNTY SETTING AND BACKGROUND

Setting

Benton County is located in south-central Washington in the middle of the Columbia Basin (See Map 4). The Columbia River forms the County's northern, eastern, and southern boundary as that major watercourse swings in an arc some 50 miles wide as the river shifts to a westerly orientation for its final 300 mile journey to the Pacific Ocean. To the west, Benton County is bordered by Yakima and Klickitat Counties.

The Yakima, Snake and Walla Walla Rivers join the Columbia within 30 miles of one another along Benton County's eastern border near the point where the Columbia River bends to begin its westward course to the Pacific Ocean. This is the historic spot where the Lewis and Clark expedition first sighted and crossed the Columbia on their march west.

Background

Benton County was established in 1905, and named after Senator Thomas Hart Benton of Missouri, who had been a longtime advocate of the development of the Oregon Territory. Prior to World War II, Benton County's economic base was predominantly agriculture. Population was small and the County was rural in character. As late as 1940, Prosser and Kennewick, each with a population of approximately 2,000 were still vying for the title of the County's largest city.

In 1943 the northeastern one-quarter of Benton County was abruptly taken over by the U.S. Army Corps of Engineers as a site for a plutonium production plant. The plutonium produced at the site was an essential part of the "Manhattan Project" which resulted in the development of the world's first nuclear weapons.

Since that time, as is described in the Economic Element, the Hanford nuclear industries have formed the basis for a strong and diverse industrial base of the County's economy. The growth and development of the County over the 35 years since World War II has resulted in the Tri-Cities (Richland and Kennewick in Benton County, Pasco in Franklin County) becoming a major metropolitan area servicing the Columbia Basin region which includes parts of Washington, Oregon and Idaho.

Benton County now has the ninth largest population of all Washington counties. During the decade 1970-1980, the County had the fourth highest population growth rate of all counties in the State and had the largest growth rate of any of the counties of comparable population. In 1971, the Benton-Franklin County area was classified as a "standard metropolitan statistical area" (SMSA). If the three adjoining cities of Richland, Kennewick and Pasco were combined they would be the fourth largest city in the state. Only Seattle, Spokane and Tacoma would have larger populations. In late 1979, a business periodical, Sales and Marketing Management predicted that the Tri-Cities would be one of the two fastest growing SMSA's in the United States during the period 1980-1983. Clearly Benton County has been experiencing phenomenal growth.

At the same time that the above mentioned growth and development has been taking place, the agricultural and related products industry, which constitutes the second major pillar of the County's economic foundation, has also been growing and developing at a substantial rate. The County is strategically located in the heart of the State's important irrigated agriculture areas. The Columbia Basin Project, the Yakima Project and the center pivot (circle) irrigation developments along the Columbia River are all important factors in the preeminence of the Columbia Basin as an irrigated agriculture area in the Pacific Northwest. As the central metropolitan area in the Basin, the Tri-Cities area has been a natural for development into an agribusiness regional service center. The County has become a center not only for the production of food and fibre products, but also for their processing, packaging, and distribution, as well as for the manufacture of such related products as chemical fertilizers.

The degree and rate of growth described above has never come painlessly to a county. The ability of local government to provide facilities and services to adequately meet the increased need in a cost effective manner is often times a very difficult task. An additional and to some extent more ominous result of such rapid, large-scale growth is the threat to the productive agricultural lands that form the foundation of the County's eminence as a developing agribusiness center. This issue is dealt with in more detail in the Economic Element of the Plan, but in brief, in a growing area, urban sprawl represents the greatest threat to the continued productivity of the agricultural and agribusiness sectors of that area's economy.

GENERAL INTENT OF THE COMPREHENSIVE PLAN

Throughout the development and adoption process for this Comprehensive Plan, several issues have continually risen to the surface as major concerns that the people of Benton County believe should be addressed by the County's Comprehensive Plan. These issues (in no particular order) are:

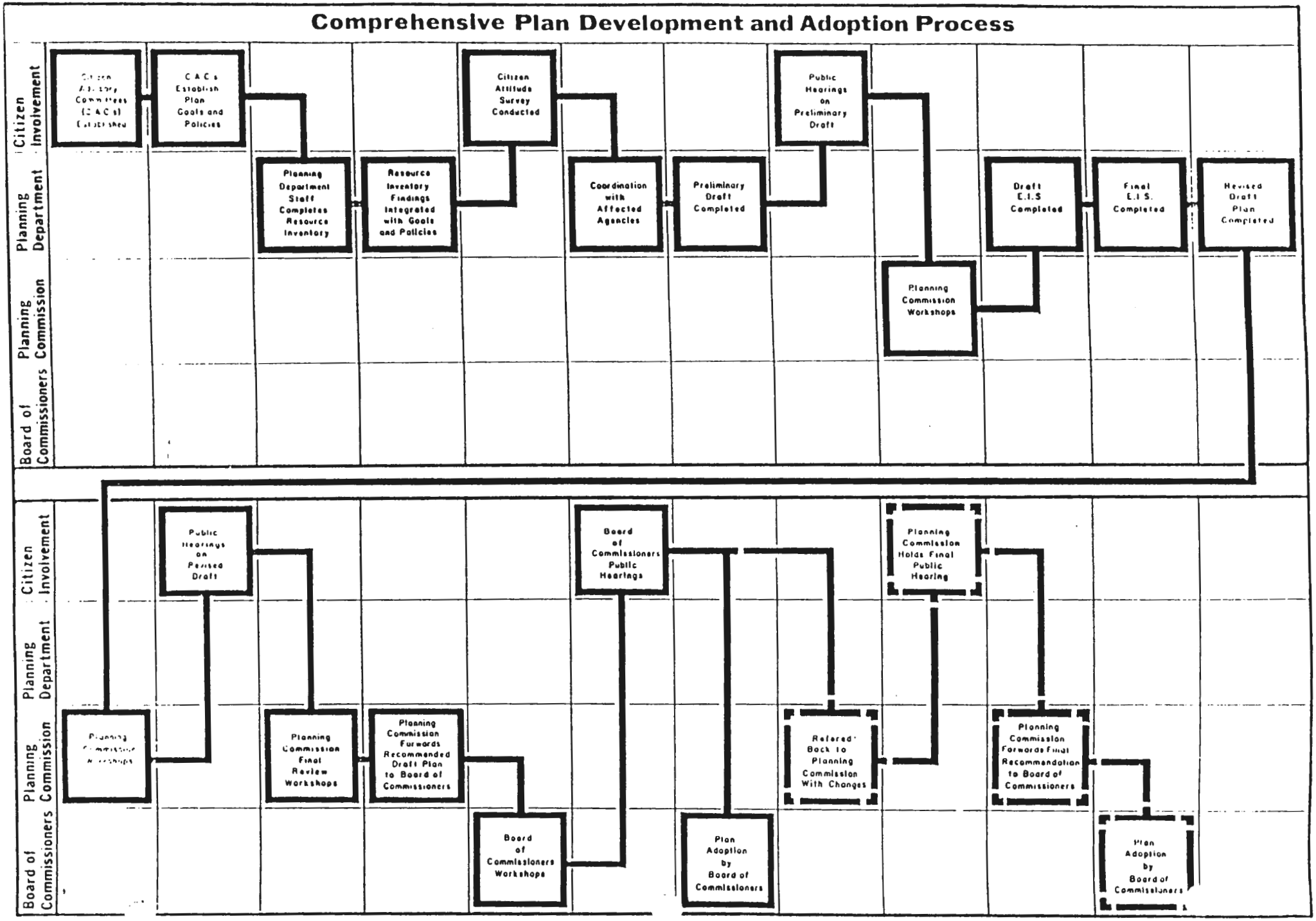
1. provisions for the economic growth of the County,
2. provisions for a variety of residential living opportunities,
3. provisions for the preservation and protection of the County's good agricultural lands,
4. provisions for the protection of the County's environmental quality and
5. provisions for the minimization of incompatible land uses.

The intent of this Comprehensive Plan is to provide for the realization of these five general goals in such a way that the County's livability is protected and enhanced for both present and future generations.

CHAPTER II

GOALS, POLICIES, AND RECOMMENDATIONS

Comprehensive Plan Development and Adoption Process



GOALS, POLICIES, AND RECOMMENDATIONS

INTRODUCTION

The following goals, policies, and recommendations provide the framework for making planning decisions in Benton County. The goals are the principal objectives of the Plan and provide the guiding framework for the future development of the County. Policies are more specific than goals and are statements that are used individually or collectively as the basis for planning decisions. They are used as implementing means for achieving the goals. Recommendations are generally more specific than policies and are those implementation measures which may be undertaken in order for the Plan provisions to be accomplished. The recommendations are advisory rather than regulatory.

The land use and circulation plan maps are the graphic provisions of the Comprehensive Plan and were formulated after the goals, policies, and recommendations contained in this chapter were drafted. The goals, policies and recommendations serve as the criteria for defining, delineating, or amending the various designations of the land use and circulation plan maps. The maps must complement the goals and policies rather than contradict them. In this respect, the goals and policies are the most important provisions of the Comprehensive Plan.

As described in Chapter 1, the Plan Elements, which follow this chapter, have a direct bearing on the goals, policies, and recommendations. The Elements contain the background information, including data and maps, that provided the basis for the development and/or refinement of many of the goals, policies, and recommendations.

The goals, policies, and recommendations have been categorized by topic area.
The categories are as follows:

1. Planning Process
2. Citizen Involvement
3. Land Use
4. Urbanization
5. Rural Lands
6. Agricultural Lands
7. Mineral and Aggregate Resources
8. Natural Disasters and Hazards
9. Environmental Quality
10. Environmentally Sensitive Areas
11. Parks, Recreation, Open Space, and Historic Preservation
12. Public Facilities and Services
13. Transportation
14. Housing
15. Economic Development
16. Community Development
17. Critical Fish and Wildlife Habitat

GOALS, POLICIES AND RECOMMENDATIONS

PLANNING PROCESS

GOAL 1

To establish a land use policy framework and planning process to be utilized as a basis for all decisions and actions related to land use and to assure that such decisions and actions are based on factual information.

POLICIES

A. That zoning and subdivision ordinances, performance standards and related implementation measures shall be used to implement the plan to ensure development and land use that are compatible with surrounding uses and which do not create traffic, safety or health hazards, or undue adverse economic impacts.

B. That Countywide resource inventories shall be used and maintained to assist in the determination of the suitability and capability of the land and its resources to support future development.

C. That land use decisions shall be determined by the inherent capability of the land to sustain that use without creating problems that require a publicly funded solution, (e.g. flooding, landsliding, etc.).

D. That the County's plans and programs shall be coordinated with those at local, regional and state levels.

GOAL 2

To develop and maintain a comprehensive plan that adapts to changing conditions.

POLICIES

A. That, as a condition of making plan changes, it shall be determined that physical, social, economic or environmental changes have occurred in the planning area or related areas since plan adoption and that a public need supports the change, or that the original plan was incorrect.

B. That the Comprehensive Plan shall undergo a major review every five years commencing the fifth year after adoption.

CITIZEN INVOLVEMENT

GOAL 3

To continue a citizen involvement program that insures the opportunity for full citizen participation in public decision-making.

POLICIES

A. That opportunities shall be provided for citizen involvement and input on issues in advance of making land use related decisions.

B. That citizens shall be provided with information through the news media to allow a maximum of citizen involvement during the land use decision making process.

LAND USE

GOAL 4

To provide a diversity of land uses while minimizing conflicts between different land uses to ensure the highest degree of public health, safety and general welfare, without unduly jeopardizing the rights of the individual.

POLICIES

A. That all lands in the County shall be classified with a land use designation and shown on the comprehensive plan map and that all implementing ordinances shall be in conformance with such map.

RECOMMENDATIONS

A. That compatible mixed uses should be considered in urban areas where community sewer and water are available or provided and when the total design is a planned unit development.

B. That in any land use plan designation there may be a diversity of potential zones to maximize opportunities for compatible development when feasible.

URBANIZATION

GOAL 5

To establish urban growth boundaries adjacent to the incorporated areas designed to provide an orderly transition from rural to urban land uses in those areas which may reasonably be anticipated to become annexed within the next 5-10 years.

POLICIES

A. That development within established urban growth boundaries as delineated on the plan map shall conform to public works requirements, performance standards and land use and circulation patterns compatible to the city and county.

B. That established community councils of unincorporated communities shall be made aware of and be encouraged to comment on developments proposed within or adjacent to their communities.

RECOMMENDATIONS

A. That agreements (including joint development standards) between the county and cities and established community councils of unincorporated communities should be established for coordinating land use planning and decision-making within urban growth boundaries.

GOAL 6

To concentrate urban development in and adjacent to existing urban areas.

POLICIES

A. That the urban growth boundary line shall be utilized to concentrate urban development in and adjacent to existing urban areas where urban services are available or are anticipated to be provided in the foreseeable future.

B. That new urban development shall be encouraged to take place near existing development.

RECOMMENDATIONS

A. That areas now served by public or private sewer and water services and other undeveloped lands existing within such service areas should develop at urban density prior to extending further urban-type development and utilities into rural areas.

B. That "leapfrog" development outside of urban growth boundaries as delineated on the plan map should be avoided.

RURAL LANDS

GOAL 7

To preserve rural lifestyles while accommodating new population growth.

POLICIES

A. That mineral and aggregate resources shall have the highest use priority where their removal is compatible with established uses.

B. That incompatible uses shall be discouraged from encroaching upon mineral and aggregate resources.

C. That sites used for the extraction of mineral and aggregate resources shall be reclaimed in a manner consistent with applicable laws and ordinances.

RECOMMENDATIONS

A. That a study should be initiated to determine quantities, qualities and location of aggregate resources within the County.

NATURAL DISASTERS AND HAZARDS

GOAL 10

To protect life and property from natural disasters and hazards.

POLICIES

A. That developments subject to damage or that could result in loss of life shall not be planned or located in known areas of natural disasters and hazards (e.g. areas potentially subject to flooding, flash flooding, subbing, landsliding, creeping, eroding, rock fall, etc.) without appropriate safeguards.

B. That an ordinance shall be adopted and maintained by the County wherein specialized building and design regulations will be set forth for the purpose of preventing hillside disasters.

RECOMMENDATIONS

A. That land use in areas subject to natural disasters and hazards should be limited to agricultural, recreational and water dependent uses or uses that will not interfere with the primary natural functions of such areas.

B. That areas downslope from irrigation canals should be considered sensitive and potentially susceptible to high water tables and that site specific studies should be required in such areas prior to making development decisions. Such studies might include but not necessarily be limited to: (1) locating perched water tables, (2) identifying areas with impermeable clay layers located close to the ground surface, and (3) identifying areas potentially susceptible to flooding due to canal failure.

C. That a study should be initiated to describe and identify areas potentially subject to subbing due to irrigation activity.

D. That until such time as the County adopts a hillside development ordinance, the Hillside Development Standards Report, Benton County Engineer Project No. E-76022, March, 1979, should be used to condition developments within areas of greater than 10 percent average ground slope.

ENVIRONMENTAL QUALITY

GOAL 11

To protect and improve the environmental quality of the County.

POLICIES

A. That land use decision making shall take into account the immediate and long-range effects of proposed uses on the environmental quality of the County, and unless so mitigated, those uses which may likely have an adverse effect on environmental quality shall be restricted.

RECOMMENDATIONS

A. That minimum lot size provisions shall be made that will ensure the perpetuation of rural lifestyles within those areas planned for rural-type development.

RECOMMENDATIONS

A. That compatible mixed uses should be considered in rural areas when the total design is a planned unit development concept provided the intent of the Comprehensive Plan is maintained.

AGRICULTURAL LANDS

GOAL 8

To identify areas for a variety of agricultural uses in an effort to preserve and maintain productive farmlands to the maximum extent possible.

POLICIES

A. That areas designated "exclusive agriculture" on the plan map shall be preserved to the maximum extent possible and protected from the encroachment of incompatible uses.

B. That areas designated "general agriculture" on the plan map shall be preserved to the extent practical until such time that demand for higher density residential or other uses is established to warrant the change.

C. In the event of a conflict between residential uses and the normal agricultural activities of a preexisting agricultural use, County support shall be in favor of the agricultural use to the extent practicable.

RECOMMENDATIONS

A. That only uses related to or supportive of agricultural activities should be allowed in designated agricultural areas. Migrant farm labor housing should be allowed but should be restricted to individual farm use and not allowed to develop as a subsidiary business.

B. That those properties that are primarily used for family hobbies and small businesses in agriculture, floriculture, horticulture, aquaculture, and stock raising should be encouraged to locate in areas designated for rural residential and general agricultural uses.

C. That only compatible land uses should be established adjacent to agricultural areas to minimize problems caused by farm operations such as overspray, underspray, dust, noise, odors, etc.

D. That legal mechanisms should be developed and used to protect productive agricultural lands from suburban growth pressures. Such mechanisms might include performance standards for developments within and adjacent to agricultural lands, zoning restrictions, property tax defferal programs, etc.

E. That prime and unique farm land (as defined by the Soil Conservation Service) and perennial-type crop land that remains in actual production year after year should be reserved for agriculturally related uses.

F. That plan provisions for the location of areas to be maintained exclusively for commercial agricultural use should be made in a manner consistent with preserving the County's productive farming areas and protecting and maintaining the County's agricultural base.

MINERAL AND AGGREGATE RESOURCES

GOAL 9

To identify and protect mineral and aggregate resources from encroaching incompatible uses.

POLICIES

A. That all development activities that are likely to have an adverse impact on air quality should file an air pollution control plan with the Tri-County Air Pollution Control Authority to minimize adverse air quality impacts.

B. That the establishment and use of adequate waste management systems should be encouraged to prevent disposal of solid and liquid waste in areas other than approved disposal sites.

C. That natural drainage areas within the County should be identified and protected wherever appropriate.

D. That drainage conditions should be recognized before installing private septic systems.

E. That noise levels should be restricted to those determined suitable for permitted land uses and activities using the Washington State Noise Abatement Regulations as minimum guidelines.

GOAL 12

To protect the integrity of domestic aquifers.

POLICIES

A. That maximum distribution of irrigation water to each parcel of land shall be encouraged in order to minimize use of domestic well water for irrigation purposes.

RECOMMENDATIONS

A. That coordination between the County and other agencies to establish a monitoring system for ground water quality and quantity should be encouraged.
B. That property owners should be encouraged to monitor ground water levels and sanitary conditions of domestic wells on an annual basis.

C. That the formation of sewer districts should be encouraged to serve developments in areas of known high water table where septic tanks are contributing to ground water pollution.

D. That development should be prohibited in areas of known limited ground water resources until adequacy of water can be confirmed.

E. That developments within irrigation districts should be provided with irrigation water distribution systems.

F. That investigation and exploration should be undertaken to define and map existing aquifers and recharge areas and to determine the extent of current use, drawdown, and expected life.

G. Development should make provisions for the protection of the quality and quantity of ground water for public water supplies.

GOAL 13

To improve the water quality of the Yakima River.

POLICIES

A. That the County shall increase its efforts to monitor and improve upstream waste disposal along the Yakima River.

B. That developments which may have detrimental impact on Yakima River water quality shall be prohibited.

GOAL 14

To preserve natural wetlands (marshes, sloughs, shorelines, etc.) that are important wildlife and game habitat or recreation areas, provided that such areas are not a detriment to public health.

POLICIES

A. That natural wetland areas that are important wildlife and game feeding, nesting, rearing or resting areas; or that are important recreation areas shall be recognized as significa wildlife habitats and should be protected from destruction or encroachment of incompatibl uses.

RECOMMENDATIONS

A. That appropriate wetland areas should be retained in their natural state as much as possible provided that such areas do not become a threat to public health.

B. That information should be developed to define and identify significant wetlands and the existing and/or potential wildlife and recreational values of each such area.

C. That public acquisition of significant natural wetlands should be encouraged.

ENVIRONMENTALLY SENSITIVE AREAS

GOAL 15

To identify and protect environmentally sensitive areas.

POLICIES

A. That areas subject to natural disasters and hazards, and appropriate adjoining buffer lands shall be designated as environmentally sensitive areas and protected from incompatible uses locating therein.

B. That on-site studies shall be required to be performed by prospective developers of designated environmentally sensitive areas to assess actual development suitability, carrying capacities and any and all environmental impacts of the proposed development on the sites; and to identify mitigating measures that will be taken by the developer.

C. That public agency acquisition of natural areas of scientific, research and educational significance shall be encouraged.

RECOMMENDATIONS

A. That natural areas of scientific, research and educational significance and appropriate adjoining buffer lands should be identified and designated as environmentally sensitive areas and protected from incompatible uses locating therein.

PARKS, RECREATION, OPEN SPACE, AND HISTORIC PRESERVATION

GOAL 16

To develop and maintain a park system for all the residents of Benton County to provide a variety of facilities and recreational opportunities including regional and local parks and trail systems for off-road recreation vehicle, bicycle, hiking and equestrian use.

POLICIES

A. That the Benton County Comprehensive Parks and Recreation Plan shall be used as a guide to develop and maintain a regional park system.

B. That cooperation shall be encouraged between developers, homeowners, and the County in developing and maintaining neighborhood parks and playgrounds.

C. That the development of a system of off-road vehicle, bicycling, hiking and equestrian trails in the county shall be encouraged and coordinated with existing and/or proposed city systems where practical.

D. That developers of low density, large lot subdivisions shall be encouraged to provide access easements for bicycle and horse riding both within the development and between contiguous developments, and to establish a means of maintaining such easements through coordination between the County, developer and homeowners.

E. That historically and archaeologically significant structures and sites shall be identified and should be preserved whenever feasible.

RECOMMENDATIONS

A. That County parks and recreation programs should be coordinated with those of the cities to avoid duplicative efforts.

B. That adequate funding for support services should be provided for the maintenance and policing of the regional park system.

C. That the County Planning Department and the County Parks Department should coordinate their planning activities to maximize compatibility.

D. That an ordinance for the dedication of parkland or fees in lieu of land by developers of new subdivisions within the County should be developed and enforced.

E. That excess County land should be traded or sold to acquire additional parklands in locations where such parks are needed.

F. That neighborhood parks and playgrounds should be reserved prior to occupancy of newly developed areas.

G. That neighborhood parks and playgrounds should be located so as to provide safe and convenient access to their service areas.

H. That prior to the sale of land owned by the County, consideration should be given to keeping the land under County ownership reserved for use as public open space.

I. That the possibility of establishing a nature trail on the north face of the Horse Heaven Hills should be studied.

PUBLIC FACILITIES AND SERVICES

GOAL 17

To provide areas for the location of public facilities and services.

POLICIES

A. That plan provisions shall be made for the location and/or protection of anticipated and/or existing public uses such as parks, playgrounds, schools, and other public, state or federal activities or facilities owned and operated for the benefit of the general public.

B. That plan provisions shall be made for the location of the United States Department of Energy Hanford Reservation (DOEHR).

C. That if and when DOEHR land is transferred to private ownership, the land use plan designation for such land shall be considered "exclusive agriculture" until such time as the comprehensive plan is amended.

RECOMMENDATIONS

A. That areas designated on the plan map for public development should be protected from the encroachment of incompatible uses and that public development locating therein should be compatible with surrounding uses.

B. That any appropriate public agency interested in purchasing property designated on the plan map for future public use should notify the owner(s) of such property of their interest is being given the right of first refusal in purchasing the property at such time in the future that such property is put on the market for sale.

GOAL 18

To develop a timely, orderly, and efficient arrangement of public facilities and services to serve as the framework for urban and rural development.

POLICIES

A. That areas developing near existing public sewer and water services shall be encourage to utilize such services.

B. That areas developing where public sewer and water services are not available shall be encourage to establish other public or private systems, such as satellite systems, local improvement district, etc., provided the proposed development complies with the intent of the Comprehensive Plan.

C. That future development of land adjacent to existing and proposed school and other public facilities as designated on the plan map shall be compatible with such uses.

D. That proposed public facilities shall be compatible with existing land uses.

E. That provisions for adequate fire protection water supplies shall be required in all developing areas.

RECOMMENDATIONS

A. That city and county emergency services should be integrated and coordinated where feasible to provide a level of protection that adequately insures the safety and security of people and property.

B. That standards for fire fighting equipment and street design should be coordinated to ensure compatibility.

C. That the need for locating efficiently operating sanitary landfills and/or dump stations in the county exists and that such should be developed and maintained.

D. That minimum uniform countywide standards for fire protection should be established.

GOAL 19

To establish standards for sewer and water utilities to provide for the integration of a comprehensive utility system.

POLICIES

A. That sewer and water utilities developed within the County shall be coordinated to facilitate future interties with municipal systems.

B. Where feasible, new drainage systems serving developments in the unincorporated portions of the Tri-Cities urban area shall be directed to areas which have gravity flow to the Yakima or Columbia Rivers or shall be maintained on site rather than directed to areas where the water would have to be pumped over U.S. Army, Corps of Engineers levees.

RECOMMENDATIONS

A. That county and city and other municipal sewer and water utility standards should be coordinated to facilitate future interties between county and city and other municipal systems.

TRANSPORTATION

GOAL 20

To provide safe, convenient and economic transportation networks.

POLICIES

A. That the Transportation Element of the Comprehensive Plan and subsequent revisions shall:

(1) be designed to facilitate the flow of goods and services so as to strengthen the local and regional economy;

(2) conform with the Land Use Element of the Comprehensive Plan;

(3) be based upon an inventory of the existing County transportation network and needs;

(4) encourage the conservation of energy;

(5) minimize adverse social, economic and environmental impacts and costs.

GOAL 21

To provide adequate roads that safely handle anticipated traffic and serve a diversified area of industrial, agricultural, commercial and residential uses.

POLICIES

A. That all road construction and reconstruction shall be designed to tie into existing or anticipated transportation networks.

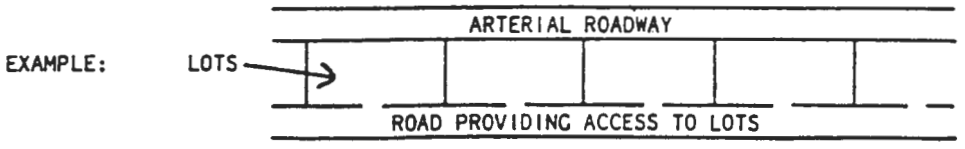
B. That road construction and reconstruction shall be planned to utilize existing facilities and rights-of-way within the County where practical, provided that such are not inconsistent with the policies of the Comprehensive Plan.

C. That increased safety and conservation of energy shall be basic factors in the design, construction and reconstruction of roads.

D. That the Transportation and Land Use Elements of the Comprehensive Plan shall be coordinated to minimize negative social, economic and environmental impacts of transportation facilities.

E. That access on major arterials shall be controlled and minimized where the primary function is through-traffic movement.

F. That "reverse frontage" development shall be encouraged on arterial roads.



G. That development of safe railroad crossings shall be encouraged by limiting the number of crossings, by installation of underpasses or signalization, and by avoiding locating roadways directly adjacent and parallel to railroad tracks where possible.

H. That guidelines for road design and construction shall be periodically updated in conformance with applicable federal and state laws and new technology.

GOAL 22

To establish city, county, and state coordination in planning improvements and maintenance of circulation patterns for the area.

POLICIES

A. That cooperation in the transportation planning and design process shall be encouraged.

GOAL 23

To provide for the means to expand the existing road system so it will accommodate future growth potential.

POLICIES

A. That plan provisions for the location and improvement of existing and future routing shall be made in a manner consistent with the goals, policies and maps of the Comprehensive Plan.

B. That the acquisition of adequate rights-of-way shall be pursued wherever the need for routing or improvements is identified on the circulation plan map.

RECOMMENDATIONS

A. That platting activity should be approved only in those areas where existing roads meet county road construction and right-of-way width standards or in those areas presently served by inadequate roads where such roads are planned to be constructed or upgraded to meet such standards within the foreseeable future.

GOAL 24

To provide safe pedestrian ways and bicycle routes.

POLICIES

A. That plan provisions for an integrated network of safe pedestrian ways and/or bicycle routes shall be made along but not limited to arterial roadways.

B. That before establishing pedestrian ways and bicycle routes, the following factors shall be considered:

(1) inclusion of the proposed way or route on the circulation plan map;

(2) public safety;

(3) the cost of such facilities as compared to the need or probable use.

RECOMMENDATIONS

A. That construction of pedestrian ways and bicycle routes should be in conformance with the uniform design standards for trails and paths as described in the Washington State Department of Transportation Design Manual, or standards developed and adopted by Benton County.

B. That a comprehensive bicycle plan, designating routes and standards, should be developed for the county.

C. That adequate pedestrian ways should be included in the design and construction of new bridges and replacements of existing bridges where feasible and appropriate.

D. That adequate pedestrian ways should be included in the design and construction of new railroad crossings and reconstruction of existing crossings where feasible and appropriate.

E. That the acquisition of abandoned railroad and irrigation canal rights-of-way should be pursued for potential use of bicycle and/or equestrian routes.

HOUSING

GOAL 25

To provide for the development of a balanced variety of dwelling unit types and densities within the County with maximum choice of living environments, considering the needs of the public at all economic levels.

POLICIES

A. That the development of a balanced variety of dwelling unit types and densities shall be encouraged.

B. That both site constructed and factory manufactured housing shall be recognized as needed and functional housing types.

GOAL 26

To provide areas for the location of a variety of residential uses while minimizing the impact on surrounding uses.

POLICIES

A. That Plan provisions for the location of high, medium and low density residential development shall be made exclusively within urban growth boundaries and within or adjacent to the communities of Finley, Plymouth, Paterson, Whitstran and Kiona.

B. That Plan provisions for the location of rural residential development shall be made in a manner consistent with preserving agricultural lands and maintaining the rural lifestyles of the County while minimizing conflicts with commercial agricultural activities.

C. That residential development that fosters energy conservation shall be encouraged provided the intent of the Plan is maintained.

D. That provisions shall be made for the location of manufactured (mobile) homes in planned manufactured (mobile) home subdivisions and parks, or on single lots when in conformance with standards governing location (on lot) of site constructed housing.

RECOMMENDATIONS

A. That standards for setting up manufactured (mobile) homes on lots should be established.

GOAL 27

To preserve existing, viable, single-family residential areas.

POLICIES

A. That existing viable single-family residential areas shall be given sufficient protection to prevent encroaching incompatible land uses which may lead to the deterioration of such residential areas.

B. That rural residential areas located outside of urban growth boundaries shall be discouraged from urbanizing provided such areas are not otherwise designated on the plan map for possible future urban expansion.

ECONOMIC DEVELOPMENT

GOAL 28

To strengthen and diversify the county's economic base.

POLICIES

A. That economic growth in the county shall be encouraged.

B. That the development of environmentally acceptable diversified industries shall be encouraged.

C. That the agricultural economic base of Benton County shall be maintained and protected.

GOAL 29

To provide adequate, accessible commercial areas while minimizing impact on surrounding uses.

POLICIES

A. That Plan provisions for the location of those commercial activities serving regional and community market areas shall be made exclusively within urban growth boundaries and within or adjacent to the communities of Finley, Plymouth, Paterson and Whitstran adjacent to existing commercial development unless the need for additional commercial land can be justified.

B. That Plan provisions for the location of commercial activities serving neighborhood commercial market areas shall be made in those areas where residential densities warrant the use.

C. That neighborhood commercial activities shall be encouraged to develop at arterial intersections and in nodal, as opposed to strip-type, development.

D. That neighborhood commercial development shall be encouraged to utilize a frontage road or a circulation system that will prevent the occurrence of numerous driveways opening onto arterial roadways.

E. That "strip" commercial development shall be discouraged.

F. That Plan provisions for the locations of commercial activities serving interstate highway traffic shall be made in those areas where access to the interstate highway is provided or planned to be provided.

G. That uses locating within areas designated "Interchange Commercial" on the plan map which do not serve interstate highway traffic will be avoided.

H. That the county shall encourage commercial developments to be planned, constructed and landscaped so as to be visually and physically compatible with surrounding uses to the extent practicable.

RECOMMENDATIONS

A. That parking standards should be established to provide adequate off-street parking for all commercial development.

B. That buffers should be provided between commercial and other uses.

C. That the county should develop landscaping and design criteria for commercial developments.

D. That community and regional commercial areas should be nodal in design with frontage roads or circulation patterns designed to limit access onto arterials.

E. That neighborhood commercial areas should be planned to accommodate local neighborhood needs.

F. That performance standards should be established and enforced to control odor, noise, light and glare, dust, fire and explosive hazards, toxic materials and other potential nuisances within commercial areas.

GOAL 30

To provide areas for the location of light and environmentally acceptable heavy industrial uses while minimizing impacts on surrounding uses.

POLICIES

A. That Plan provisions for the location of a diversity of light and heavy industrial uses shall be made in a manner consistent with maintaining environmental and community quality.

B. That light and environmentally acceptable heavy industrial uses shall be encouraged to locate in areas where:

(1) access can be provided by major transportation networks such as road, rail, air and water;

(2) existing development is characterized by and/or compatible with industrial activity;

(3) utilities, including electric, gas, water and sewer, can adequately serve the use.

C. All lands designated heavy industrial located within Urban Growth Boundaries that adjoin any lands designated residential, commercial or public shall be governed by a set of performance standards set forth within the zoning ordinance and by the following restrictions:

CHAPTER III

POPULATION ELEMENT

(1) To comply with all State and Federal laws and regulations with regard to the disposal of pollutants of any nature into the water or the reservoirs.

(2) That any activity which creates a constant or frequent level of noise in excess of 65 decibels beyond the boundary of the property shall not be permitted.

(3) That no activity or use shall be carried on or permitted on the property which would generate obnoxious odors, fumes, dust, or create other conditions which would be in violation of local, State, or Federal laws and regulations with regard to air pollution.

(4) No use shall be permitted that will result in the disposal of pollutants of any nature, floatable or nonfloatable, into water courses, watersheds, reservoirs, by stream, floods, or otherwise which could be detrimental to public health, safety, and welfare.

(5) Prior to the approval or disapproval of any development the County shall take into consideration the following criterion:

(a) That technological advances in industrial operations may allow a variety of uses to operate in a manner that is not detrimental to surrounding land uses.

(b) That industrial operations characteristics such as noise, air pollution, water pollution and odors have benefited from technological advances.

(c) That the opportunity exists to locate a wide variety of industries and regulate their operations to minimize their adverse effects on surrounding land uses.

D. That buffer areas shall be required at the edge of industrial areas where appropriate to protect adjacent existing land uses.

E. That land use types other than industrial or industrially related uses in an industrial area shall be discouraged.

RECOMMENDATIONS

A. That non-agricultural related industry should be located on sites unsuitable for food production and in areas where access problems will be at a minimum.

B. That performance standards should be established and enforced to control dust, odor, glare, smoke, noise, gases, traffic and other potential nuisances at levels compatible with surrounding uses.

C. That established industrial areas in compliance with the Plan and areas designated for industrial use on the plan map should be protected from the encroachment of incompatible uses.

COMMUNITY DEVELOPMENTS

GOAL 31

To allow for the provision of planned communities in agricultural and industrial areas.

POLICIES

A. That in developing agricultural and industrial areas the need for new communities shall be recognized and that upon demonstration of demand and need, appropriate plan designations shall be applied to allow for the development of such communities.

B. That the approval of a new community shall be contingent upon a unified development plan addressing the need to provide for adequate roads, utilities and services; as well as residential, commercial and public land uses.

C. That a new community proposal, located in an agricultural area, shall be developed on lands that have a low potential for agricultural production.

D. That new communities shall be intended to serve adjacent agricultural and industrial populations and to form a community center for that area.

CRITICAL FISH AND WILDLIFE HABITAT

GOAL 32

To identify and protect critical fish and wildlife habitat from destruction or encroachment of incompatible uses.

POLICIES

A. That public acquisition of critical fish and wildlife habitats shall be encouraged.

B. That prior to the County denying proposals or requiring applicants to provide mitigating measures or revise their development to accommodate critical fish and wildlife habitat areas, State or local agencies, or environmental organizations must identify and substantiate that critical fish and wildlife habitat areas do exist within the development project or will be affected by the development.

RECOMMENDATIONS

A. That developers should take into consideration preserving critical fish and wildlife habitat within their development plans.

POPULATION ELEMENT

INTRODUCTION

The recent growth trend for Benton County has been one of almost phenomenal growth, primarily as a result of development and expansion of activities related to the nuclear energy facilities located at the U.S. Department of Energy's Hanford Nuclear Reservation. This rapid population growth and accompanying land development make the need for comprehensive long-range planning all the more self-evident if Benton County is to have any influence on its own destiny.

This Population Element provides an overview of some of the County's population characteristics, trends, and projections. The information provided is intended to be of assistance to the County's decision-makers as they chart the course to be followed by the County over the long-range planning period.

CURRENT CHARACTERISTICS

According to advance counts from the 1980 census, Benton County's 1980 population was 109,444. The number of people living within the city limits of the County's five incorporated cities was 76,789, or approximately 70 percent of the County's total population. Table 1 presents some of this population data.

TABLE 1: 1980 CENSUS DATA

Jurisdiction	1980 Population (Advance Census Counts)
Benton County	109,444
City of Kennewick	34,397
City of Richland	33,578
City of Prosser	3,896
City of West Richland	2,938
City of Benton City	1,980
TOTAL POPULATION, INCORPORATED AREA	76,789 (70%)
TOTAL POPULATION, UNINCORPORATED AREA	32,655 (30%)

Urban/Rural Characteristics

In order to determine a population estimate for what would be considered Benton County's major urban area (i.e., the Benton County portion of the Tri-Cities urban area, both incorporated and unincorporated), the 1980 census counts for the census tracts in these areas were added together. The resulting figures indicate a total population of 84,662 for this metropolitan area within Benton County. This represents approximately 77 percent of the County's total population, indicating that over three-quarters of the County's population live in the Benton County portion of the Tri-Cities urban area.

When the populations of the City of Prosser and the City of Benton City are added to these statistics, we find that over 80 percent of the County's population lives in what would be referred to as an urban environment. Demographically, Benton County is very much an urban county. This characteristic can be further put into perspective by the figures presented in Table 3, which show that out of Washington's 39 counties, Benton County has the ninth largest population.

Ethnic Composition Characteristics

The nonwhite population in Benton County is small. The percentage of the County's population that is in this category is smaller that the percentage found in the State of Washington's total population, and is substantially smaller than the percentage of the Nation's population that is nonwhite. The figures are presented in Table 2.

TABLE 2: 1980 BENTON COUNTY ETHNIC COMPOSITION

White	Black	Am. Indian Eskimo and Aleut	Asian and Pacific Islands	Other	Spanish Language Origin
103,107 (94%)	857 (1%)	779 (1%)	1,458 (1%)	3,243 (3%)	4,598 (4%)

SOURCE: U.S. Bureau of the Census, 1980

TRENDS

As is shown by Table 4 and Figure 2 Benton County has been experiencing substantial and in some cases phenomenal population growth since World War II, largely as a result of the growth and development of the nuclear industries associated with the Hanford nuclear projects.

During the period from 1940 to 1950 the County's population grew 326 percent - a population growth rate rarely experienced by counties. During the 1950's and 1960's this rate tapered off somewhat, only to pick up again during the 1970's. As is shown on Table 5, Benton County experienced the fourth highest population growth rate of all counties in the state during the 1970's and was the fastest growing county of the 10 most populous counties in the state.

As is shown by Figure 2, the population of the County's cities has increased at a much faster rate then that of the unincorporated area. As late as 1940, the total population of all of the cities in Benton County was only 60 percent as large as the County's unincorporated population. Ten years later the County's cities had more than twice the population that was found in the unincorporated area. This trend has continued, and in 1980, almost three times as many people lived within the cities as lived in the unincorporated area.

PROJECTIONS

It is anticipated that Benton County's population growth will continue at a rapid rate. Figure 3 shows the most recent population projections for Benton County available from the State of Washington's Office of Financial Management and indicates a projection of 162,245 people by the Year 2000. This agency is responsible for computing the State's official population projections by county. The projection shown was computed by the Office in the spring of 1981 and includes adjustments resulting from the 1980 Census figures.

TABLE 4: BENTON COUNTY POPULATION TRENDS, 1930-1980

JURISDICTION	1930	1940	1950	1960	1970	1980
Incorporated area	3,661	4,484	35,414	43,112	46,633	76,789
Benton City	365	600	863	1,210	1,070	1,980
Kennewick	1,519	1,918	10,106	14,244	15,212	34,397
Prosser	1,569	1,719	2,636	2,763	2,954	3,896
Richland	208	247	21,809	23,548	26,290	33,578
West Richland				1,347	1,107	2,938
Unincorporated area	7,291	7,569	15,956	18,958	20,907	32,655
TOTAL County	10,952	12,053	51,370	62,070	67,540	109,444

Sources: State of Washington, Office of Financial Management and the U.S. Bureau of the Census.

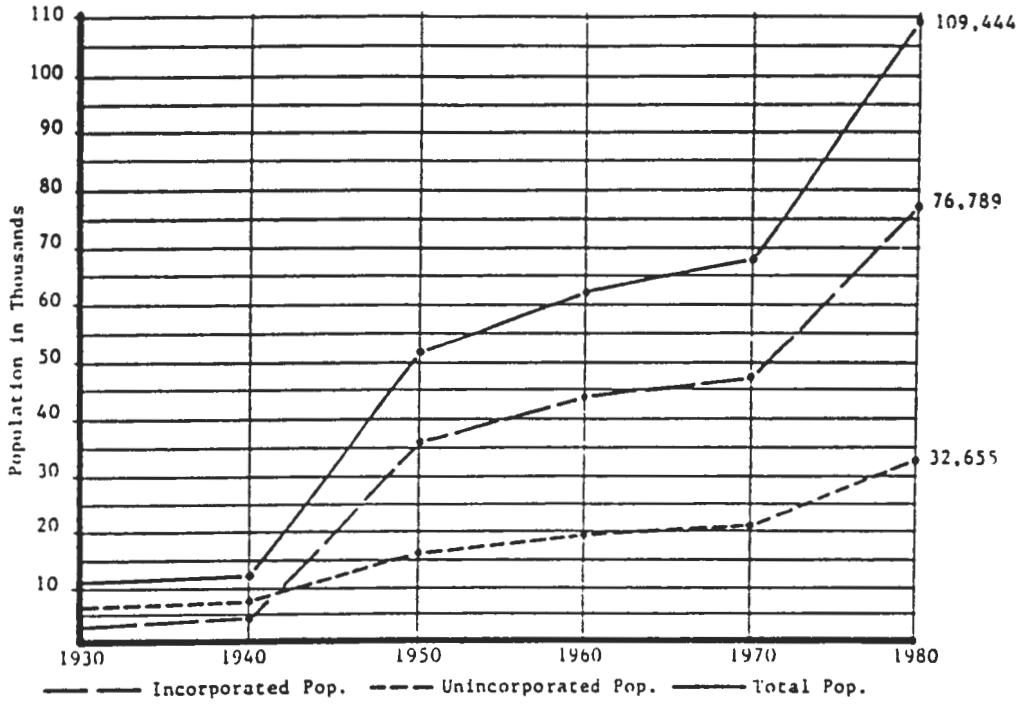
TABLE 3: 1980 POPULATION OF WASHINGTON COUNTIES (Advance Census Counts)

State of Washington 4,130,163

COUNTY	1980 POPULATION	RANK
King	1,269,749	1
Pierce	485,643	2
Spokane	341,835	3
Snohomish	337,016	4
Clark	192,227	5
Yakima	172,508	6
Kitsap	146,609	7
Thurston	124,264	8
Benton	109,444	9
Whatcom	106,701	10
Cowlitz	79,548	11
Grays Harbor	66,314	12
Skagit	64,138	13
Lewis	55,279	14
Clallam	51,648	15
Grant	48,522	16
Walla Walla	47,435	17
Chelan	45,061	18
Island	44,048	19
Whitman	40,103	20
Franklin	35,025	21
Mason	31,184	22
Okanogan	30,639	23
Stevens	28,979	24
Kittitas	24,877	25
Douglas	22,144	26
Pacific	17,237	27
Asotin	16,823	28
Jefferson	15,965	29
Klickitat	15,822	30
Adams	13,267	31
Lincoln	9,604	32
Pend Oreille	8,580	33
Skamania	7,919	34
San Juan	7,838	35
Ferry	5,811	36
Columbia	4,057	37
Wahkiakum	3,832	38
Garfield	2,468	39

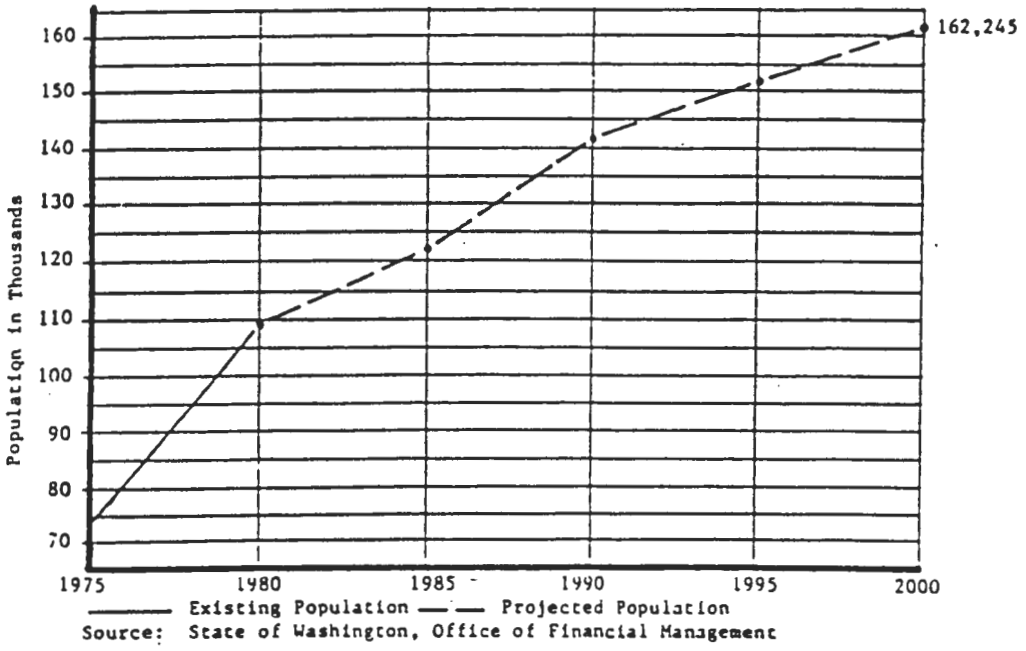
Source: U.S. Bureau of the Census, 1980 Census

FIGURE 2: BENTON COUNTY POPULATION TRENDS, 1930-1980



Sources: State of Washington, Office of Financial Management and the U.S. Bureau of the Census.

FIGURE 3: BENTON COUNTY POPULATION PROJECTION 1980-2000



Source: State of Washington, Office of Financial Management

TABLE 5: PERCENT CHANGE IN POPULATION IN WASHINGTON COUNTIES 1970-1980

	1970 Population	1980 Population	Percent Change
State of Washington	3,413,244	4,130,163	21

COUNTY	1970 POPULATION	1980 POPULATION	PERCENT CHANGE	RANK (BY % CHANGE)
San Juan	3,865	7,838	103	1
Stevens	17,405	28,979	67	2
Island	27,011	44,048	63	3
Benton	67,540	109,444	62	4
Thurston	76,894	124,264	62	5
Ferry	3,655	5,811	59	6
Jefferson	10,661	15,965	50	7
Clark	128,454	192,227	50	8
Mason	20,918	31,184	49	9
Clallam	34,770	51,648	49	10
Kitsap	101,732	146,609	44	11
Pend Oreille	6,025	8,580	42	12
Franklin	25,816	35,025	36	13
Skamania	5,845	7,919	36	14
Douglas	16,787	22,144	32	15
Klickitat	12,138	15,822	30	16
Whatcom	81,983	106,701	30	17
Snohomish	265,236	337,016	27	18
Skagit	52,381	64,138	22	19
Asotin	13,799	16,823	22	20
Lewis	45,467	55,279	22	21
Spokane	287,487	341,835	19	22
Yakima	145,212	172,508	19	23
Okanogan	25,867	30,369	18	24
Pierce	412,344	485,643	18	25
Cowlitz	68,616	79,548	16	26
Grant	41,881	48,522	16	27
Walla Walla	42,176	47,435	13	28
Grays Harbor	59,553	66,314	11	29
Adams	12,014	13,267	10	30
Chelan	41,103	45,061	10	31
King	1,159,369	1,269,749	10	32
Pacific	15,796	17,237	9	33
Wahkiakum	3,592	3,832	7	34
Whitman	27,900	40,103	6	35
Lincoln	9,572	9,604	0	36
Kittitas	25,039	24,877	-1	37
Columbia	4,439	4,057	-9	38
Garfield	2,911	2,468	-15	39

CHAPTER IV

PHYSICAL ELEMENT

It should be noted that one of the major reasons for having a five year review period is to be able to periodically update the long-range population projection for the County. In this way this important piece of background information can be continually kept current with recent population trends.

The population projection utilized should not be considered an absolute. However, the substantial growth being projected for the County over the long-range planning period is significant. That kind of growth can lead to serious difficulties in maintaining the County's livability if it is not well managed. One of the key management tools at the County's disposal in this regard is its planning process. Development and adoption of a comprehensive plan is the fundamental element in this process. The goals, policies, and maps of the Comprehensive Plan identify how the County intends to deal with the problems and opportunities that will arise as the County grows over the long-range planning period.

PHYSICAL ELEMENT

INTRODUCTION

The physical environment of Benton County includes a variety of factors that affect man's developments or improvements upon the land. Some of the factors involved can present hazards to the people who will live and work in the County. This element of the Comprehensive Plan is primarily designed to identify and analyze these natural hazards so that the growth of the County can take place with a minimum of risk to the health and safety of its citizens while at the same time encouraging sound management of the County's important natural resources.

Much of the information provided in this Element is also found in the Draft Environmental Impact Statement (August, 1980) for this Comprehensive Plan. For a more in-depth description of the County's physical characteristics, the reader is referred to that document.

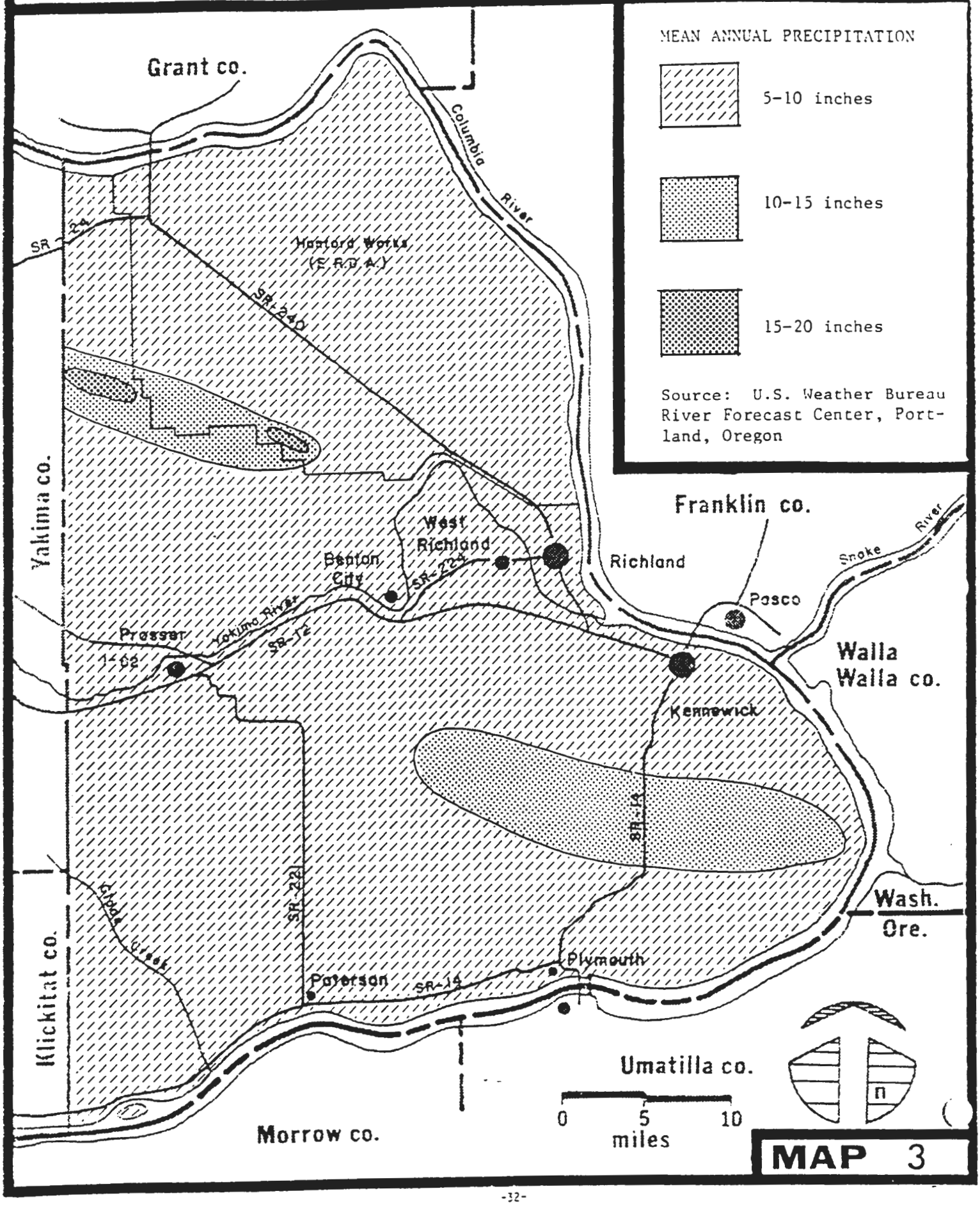
CLIMATE

Benton County is located in the central part of the Columbia Basin. This landform, which is more thoroughly described in the section on topography, is surrounded by mountain ranges which have a pronounced effect upon the region's climate. Meteorological data regarding the region is collected from weather stations located throughout the area. The following description of Benton County's climate has been extracted from a National Weather Service climatological summary for the area.

> "This section of the State has a very dry climate with rather mild winters and warm sunny summers. The Rocky Mountains and ranges in southern British Columbia are effective in protecting the inland basin from the more severe winter storms moving southward across Canada. Occasionally an outbreak of cold air will reach the basin and result in low temperatures or a damaging spring or fall freeze. In a westerly direction, the Cascade Mountains, elevation 4,000 to 7,000 feet with peaks in excess of 10,000 feet, obstruct the easterly movement of moist air from over the ocean. Prevailing westerly winds above the mountains are strongest in winter. Moist air from over the ocean traveling east across the State cools as it rises along the western slope of the Cascade range and warms as it descends along the eastern slope. This results in heavy precipitation on the windward and light precipitation on the lee slopes. Annual precipitation decreases from approximately 100 inches near the summit of the Cascades to less than 8 inches in the driest section of the basin. In the tri-city (sic) area, annual precipitation ranges from 7 to 8 inches in the lower elevations increasing to 10 inches or more on the Horse Heaven Hills and higher elevations. Approximately 70% of the moisture is received in the six-month period November through April. Rainfall is light in the summer gradually increasing in the late fall, reaching a peak of about one inch each month in mid-winter, then decreasing in the spring with an increase in June and a sharp drop in July. In midsummer, it is not unusual for three to six weeks to pass with only a trace of rain. Thunderstorms occur on 10 to 15 days between March and October. Rainfall associated with thunderstorm activity is usually light; however, occasionally hail and heavy showers are reported. Winter precipitation may occur as rain or snow. The winter season snowfall has ranged from less than ½ inch in 1957-1958 to 44 inches in 1915-1916. Snow seldom remains on the ground longer than two to four weeks or reaches a depth in excess of 4 to 6 inches. The greatest depth on the ground, 21 inches, was recorded in February 1916. Snow cover is sometimes melted rapidly by rain or a Chinook Wind.
>
> Afternoon temperatures in the warmest summer months are in the lower 90's and nighttime readings are in the upper 50's. Maximum temperatures can be expected to reach 103° or higher on about four days in two out of ten summers. The number of days with maximum temperatures of 90° or higher has ranges from 26 to 77 in the summer season. Relative humidity is low and the warmest afternoons are not especially unpleasant. Loss of water by evaporation ranges from 8 to 12 inches each month in midsummer. Evaporation from lakes and reservoirs is estimated at approximately 40 inches annually. The growing season is about 185 days extending from mid-April to mid-October.
>
> In the winter season, afternoon temperatures range from 35° to 45° and nighttime readings from 20° to 30°. Minimum temperatures can be expected to drop to 6° above zero or lower of four nights in two out of ten winters. In one of the coldest winters in recent years, 1949-1950, minimum temperatures dropped to zero or lower on 18 nights; -15° or lower on 7 nights; and to -23° on one night. In one of the warmest winters, 1957-1958, the lowest temperature was 19° above zero. Afternoon temperatures remain below freezing on about one-third of the days in January. The number of days with maximum temperatures below

Benton County Comprehensive Plan

Precipitation



MAP 3

freezing has ranged from 2 to 46 in the winter season. A Chinook wind sometimes results in a rapid rise in the temperature.

During the winter season, moist air crossing the Cascade range and mixing with the colder air in the inland basin results in considerable cloudiness and some fog. Sunshine data recorded at Walla Walla is representative of conditions in this section of the State. The percent of the possible sunshine received each month ranges from 20% to 30% in the winter; 50% to 60% in spring and fall; 80% to 85% in midsummer. The number of clear days each month increases from about five in the winter to more than 20 in the summer. Strong westerly winds associated with rapidly moving weather disturbances result in some blowing dust."

TOPOGRAPHY

As mentioned, Benton County is located in the central part of the Columbia Basin. In addition to north central Oregon, the Basin includes most of central and south central Washington east of the Cascades (See Map 4). The Basin is drained by the Columbia River which forms Benton County's northern, eastern and southern boundary. The Columbia Basin is ringed by mountains, with the Cascades to the west, the Blue Mountains to the south, and the Northern Rocky Mountains-including such ranges as the Clearwater, Selkirk, Kettle River, and Okanogan Highlands - to the east and north.

Within Benton County, topography is predominately defined by basin and valley bottomland and upland plateau of the lower Yakima Valley, Pasco Basin and Horse Heaven Hills. The most significant exception is the ridge system of the Rattlesnake Hills, rising more than 2,000 feet above and separating the valley and basin, and rising approximately 1,000 feet above and north of the Horse Heaven Hills plateau. The highest elevation in the County, 3,629 feet, is found in the Rattlesnake Hills north of Prosser near the Yakima County line.

The Rattlesnake Hills ridge system is aligned in a southeasterly direction stretching from the Cascade Range to the Horse Heaven Hills at the approximate midpoint of Benton County. The orientation of the Horse Heaven Hills northern ridge system forms the shape of an inverted "V" as it bisects the County in southwest and southeast lines from this midpoint. The lower Yakima Valley is located between the Horse Heaven and Rattlesnake Hills. East of the midpoint the smaller peaks of the Rattlesnake ridge system (Red, Candy, and Badger Mountains) run parallel to the Horse Heaven Hills forming Badger Canyon. East of Badger Canyon and south of Kennewick and Finley, the Rattlesnake and Horse Heaven Hill converge.

The Horse Heaven Hills encompass approximately two-fifths of the County land area, rising from the lowest elevation in the County of 265 feet at the southern County border along the north bank of the Columbia River, to elevations of over 2,000 feet along peaks of the ridge system at its northern extremities. An escarpment forms part of the northern ridge from the Yakima County line to Badger Canyon, where basalt cliffs are exposed and talus slopes (broken basalt formed from cliff weathering) extend down to the valley floor. East of this escarpment, the basalt is seldom exposed as the Horse Heaven Hills rise to their highest elevation of 2,200 feet at Jump Off Joe south of Kennewick. The Columbia River forms the eastern boundary of the Horse Heavens at Wallula Gap where the river has cut through the basalt, forming high cliffs of the exposed rock.

The Yakima River, flowing from the Cascade Range to its confluence with the Columbia River at the City of Richland on the County's eastern border, traverses both the Yakima Valley and the Pasco Basin. The river cuts through the Rattlesnake Hills ridge system northeast of Benton City.

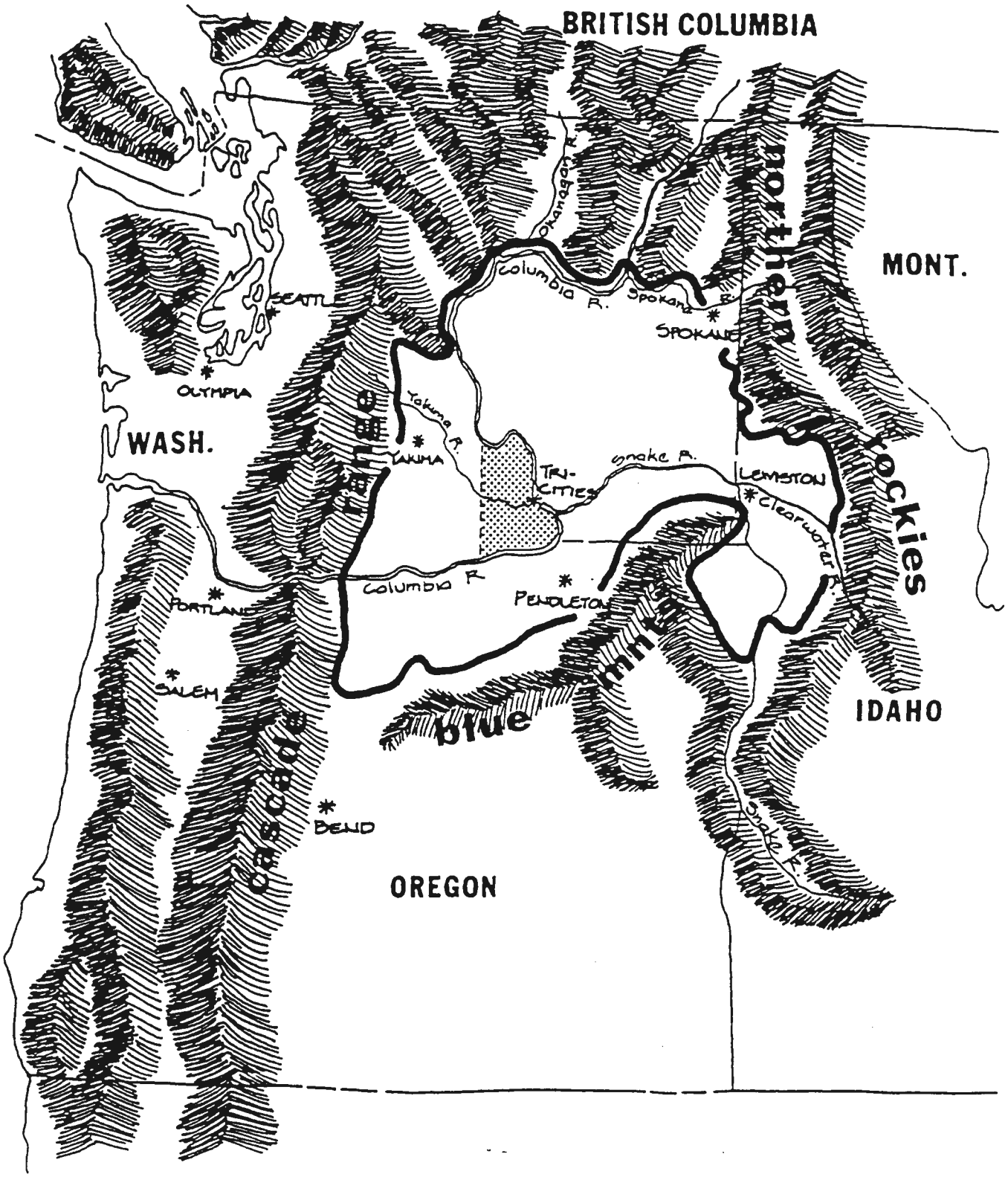
Of the five incorporated communities in the County, Prosser, Benton City, and West Richland are located adjacent to the Yakima River, Kennewick borders the Columbia and Richland is at the confluence of the Yakima with the Columbia. Elevations of all of the communities are in the 300-700 foot range. The two unincorporated communities of Plymouth and Paterson border the Columbia River at the County's southern border below McNary Dam. Elevations at Plymouth and Paterson are 300 and 400 feet respectively.

The Hanford Reservation encompasses virtually all of the desert land of the Pasco Basin north of Richland and northeast of the Rattlesnake Hills. This area forms a broad plain of slight relief with elevations varying in the 400-600 foot range. The lower Yakima Valley and that portion of the Pasco Basin south of Kennewick in the Finley area are of similar mildly sloping relief. Elevations of these areas range from 330-600 feet in the Finley vicinity and from 500-1,100 feet in the lower Yakima Valley.

SOILS

Benton County Comprehensive Plan

The Columbia Basin



MAP 4

The U.S. Soil Conservation Service (SCS) is responsible for the national program designed to conserve and develop our soil and water resources. As part of this program the SCS conducts soil surveys which include mapping of soil types, determining their physical characteristics, and assessing their capabilities and limitations.

In 1971 the SCS published a soil survey of Benton County which described the types of soils found in the County, where they are located, how they can be used, and their capability for growing different types of crops. Similar types of soils are grouped together into soil associations. The SCS defines a soil association as a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and is named for the major soils. The soils in one association may occur in another, but in a different pattern.

Map 5 shown the locations of the soil associations in Benton County as determined by the SCS survey. The usefulness of a general soil map of this nature is described by the following statement extracted from the 1971 Soil Survey:

> "A map showing soil associations is useful to people who want a general idea of the soils in an area, who want to compare different parts of an area, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments."

The following is a description of the eight soil associations found in the County and shown on Map 5. The descriptions have been excerpted from the 1971 SCS Soil Survey.

1. Ritzville-Willia association: Gently sloping soils that are silt loam throughout and very deep to shallow over basalt bedrock; formed in loess; precipitation zone 9 to 12 inches.

   This association occurs mainly in the higher part of the Horse Heaven Hills and midway up the slopes in the Rattlesnake Hills. The topography is generally smooth and gently sloping, but steeper areas along the larger drainageways are included. The mean annual temperature is approximately 48° F., and the frost-free season is about 140 days. Elevations range from 1,200 to 2,500 feet.

   This association is used mainly for wheat, barley and rye in a summer-fallow system. Soils that are shallow, stony, or steep are used for grazing. The vegetation in uncultivated areas is grass and sagebrush.

2. Warden-Shano association: Gently sloping soils that silt loam throughout and very deep to moderately deep over basalt bedrock; formed in lacustrine material and loess; precipitation zone 6 to 9 inches.

   This association occurs mainly midway up the slopes of the Horse Heaven Hills, in the lower Rattlesnake Hills, and in the vicinity of Kiona. The topography is generally smooth and gently sloping but is steeper along the larger drainageways. The mean annual temperature is approximately 50° F., and the frost-free season is about 150 days. Elevations range from 550 to 1,200 feet.

   This association is used mainly for wheat, barley, and rye in a summer-fallow system. Approximately 18 percent of it is within irrigation districts. The Warden and Shano soils are highly productive, and many crops are suitable. Soils that are shallow, stony or too steep for cultivation are used for grazing. The vegetation in uncultivated areas is grass and sagebrush.

3. Walla Walla Endicott-Lickskillet association: Gently sloping soils that are silt loam throughout and very deep to shallow over basalt bedrock; formed in loess, precipitation zone 11 to 15 inches.

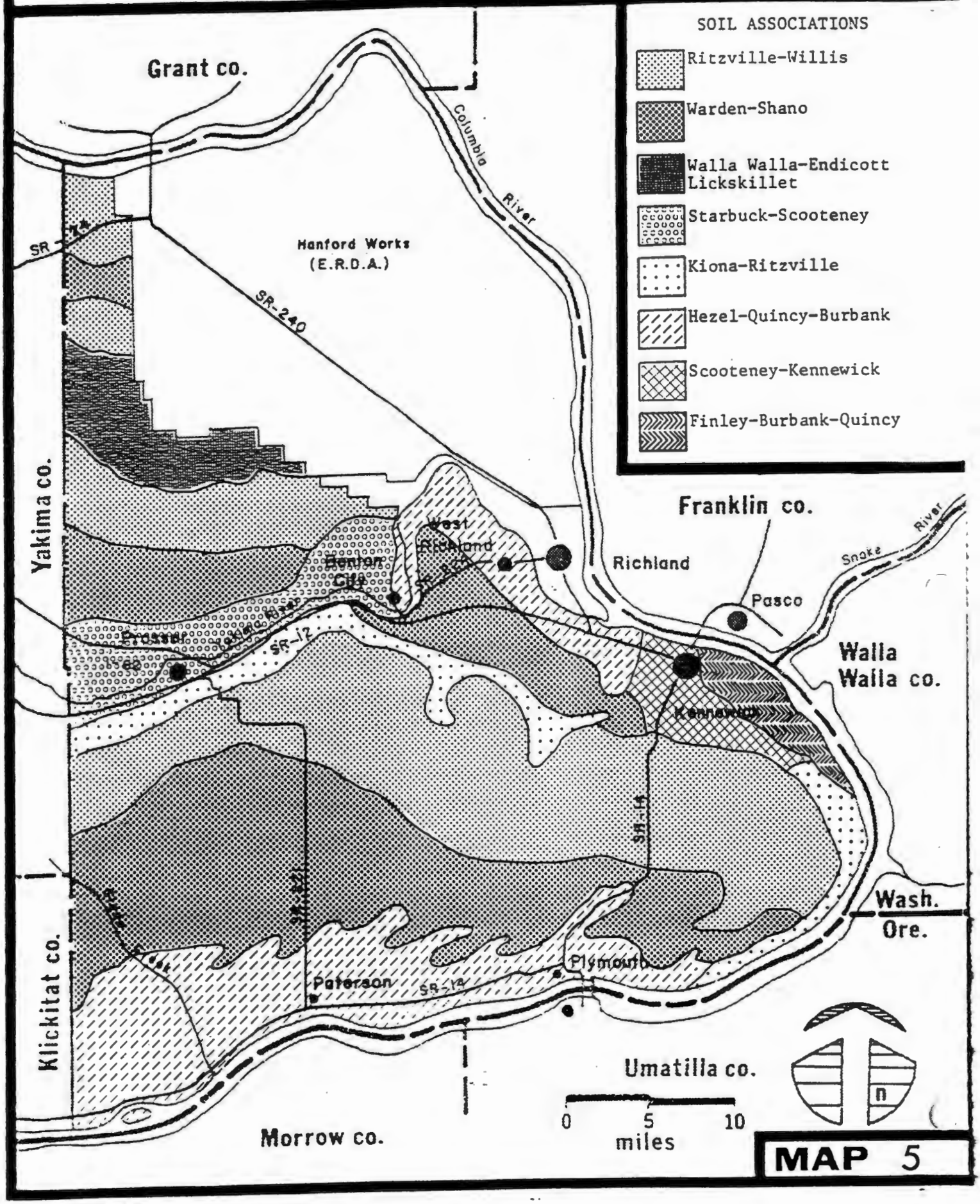
   This association occurs mainly in the higher parts of the Rattlesnake Hills. The topography is generally smooth and gently sloping, but steeper areas along the larger drainageways are included. The mean annual temperature is approximately 47° F., and the frost-free season is about 130 days. Elevations range from 2,200 to 3,500 feet.

   This association is used mainly for wheat, barley, and rye in a summer-fallow system. Soils that are shallow, stony, or steep are used for grazing. The vegetation in uncultivated areas is grass and sagebrush.

4. Starbuck-Scooteney association: Gently sloping soils that are silt loam throughout and shallow to very deep over gravel or basalt bedrock; formed in old alluvium and loess; precipitation zone 6 to 9 inches.

Benton County Comprehensive Plan

General Soils



MAP 5

This association occurs mainly along the Yakima River. The topography is generally smooth and gently sloping but some basalt escarpments are included. The mean annual temperature is approximately 50° F., and the frost-free season is about 155 days. Elevations range from 500 to 1,000 feet.

Except for areas that are too stony or too steep, most of this association is irrigated. Starbuck and Wamba soils are used mainly for hay and pasture. Scooteney soils are used for tree fruits and grapes, as well as for hay and pasture. The vegetation in uncultivated areas is grass and sagebrush.

5. Kiona-Ritzville association: Steep soils that are silt loam throughout and very deep to shallow over basalt rubble or bedrock; formed in loess and residuum; precipitation zone 6 to 12 inches.

   This association occupies bluffs that extend from Horse Heaven Hills to the Columbia River and areas along the Yakima River. The topography is rough and steep; rock outcrops and escarpments are common. The mean annual temperature is approximately 49° F., and the frost-free season is about 147 days. Elevations range from 800 to 2,500 feet.

   This association is used for grazing and for wildlife habitat. The vegetation is mainly grass and sagebrush.

6. Hezel-Quincy-Burbank association: Gently sloping soils that have a loamy sand surface layer and are very deep to shallow over gravel, lacustrine material, or basalt bedrock; formed in windblown sand, lacustrine material, or alluvium; precipitation zone 6 to 9 inches.

   This association occurs in two main areas: One area is in the southern part of Benton County along the Columbia River, and the other is northwest of Kennewick and south of the Horn and the Yakima Rivers. The topography is smooth and gently sloping. The mean annual temperature is approximately 51° F., and the frost-free season is about 170 days. Elevations range from 300 to 900 feet.

   Most of this association is used as rangeland. The natural vegetation is mainly grass and sagebrush.

7. Scooteney-Kennewick association: Gently sloping, very deep soils that are silt loam throughout; formed in old alluvium and lacustrine material; precipitation zone 6 to 9 inches.

   This association, which includes the City of Kennewick, occurs in the southeastern part of the County. The topography is mainly smooth and gently sloping. The mean annual temperature is approximately 50° F., and the frost-free season is about 150 days. Elevations range from 550 to 800 feet.

   This association is used for many kinds of irrigated crops. The vegetation in uncultivated areas is mainly grass and sagebrush.

8. Finley-Burbank-Quincy association: Nearly level soils that are loamy sand to very fine sand throughout; formed in old alluvium and windblown sand; precipitation zone 6 to 9 inches.

   This association occurs in the southeastern part of the County, along the Columbia River. It is generally east of Kennewick. The topography is mainly smooth and nearly level. The mean annual temperature is approximately 51° F., and the frost-free season is about 160 days. Elevations range from 350 to 450 feet.

   Most of this association is irrigated and used for hay and pasture. A few areas are used for grapes, mint, asparagus, and other crops. The vegetation in uncultivated areas is grass and sagebrush.

CONSTRUCTION LIMITATIONS

The SCS has developed soil ratings that indicate the potential degree of limitations for different types of development on different soil types. For example, a particular soil type might be rated as having slight, moderate, or severe limitations for the development of roads or dwellings. A variety of criteria are used in making such determinations, including such factors as depth to bedrock, shrink-swell potential, permeability, slope, etc.

It should be noted that even a "severe" rating would not necessarily mean that constructions

would not be possible. Rather, it means that the potential limitation should be recognized, and that the construction techniques employed may have to take the special soil conditions into consideration. In all cases, SCS emphasizes that on-site inspection or soil survey would be necessary before it can be determined for certain whether or not such soil characteristics exist at a specific site.
The following definitions from the Guide for Interpreting Engineering Uses for Soils (SCS, 1972), describes the SCS soil ratings:

Slight soil limitation is the rating given soils that have properties favorable for the rated use. The degree of limitation is minor and can be overcome easily. Good performance and low maintenance can be expected.

Moderate soil limitation is the rating given soils that have properties moderately favorable for the rated use. This degree of limitation can be overcome or modified by special planning, design or maintenance. During part of the year the performance of the structure or other planned use is somewhat less desirable than with the soils rated slight. Some soils rated moderate require treatment, such as artificial drainage, runoff control to reduce erosion, extended sewage absorption fields, extra excavation, or some modification of certain features through manipulation of the soil. For those soils, modification is needed for those construction plans generally used for soils of slight limitation. Modification may include special foundations, extra reinforcement of structures, sump pumps, and the like.

Severe soil limitation is the rating assigned to soils that have one or more properties unfavorable for the rated use, such as steep slopes, bedrock near the surface, flooding hazard, high shrink-swell potential, a seasonal high water table, or low bearing strength. This degree of limitation generally requires major soil reclamation, special design, or intensive maintenance. Some of these soils, however, can be improved by reducing or removing the soil feature that limits use, but in most situations it is difficult and costly to alter the soil or to design a structure so as to compensate for a severe degree of limitation.

Due to the number and complexity of soil types involved, construction limitations have not been synthesized into a Countywide map. The information is available by soil type and is an important tool in the planning process. As stated in the Guide for Interpreting Engineering Uses of Soils:

> "In rating soils for nonfarm uses, it is important to remember that engineers and others can modify natural soil features or can design or adjust the plans of a structure to compensate for most degrees of limitation. Most of these practices, however, are costly. The owner must be willing to live with a few limitations, providing the use does not violate community codes or regulations. The final decision in selecting a site for a particular use is a personal one and generally involves weighing the costs for site preparation and maintenance."

AGGREGATE RESOURCES

Second in importance to agriculture land as a natural resource in Benton County is aggregate. Aggregate is used here to refer to both (1) sand and gravel deposits and (2) crushed quarry rock. Most of the sand and gravel deposits found in the County are within the flood plains and old ancestral river channels of the Columbia and Yakima Rivers, or in areas inundated by glacial floods of prehistoric time. The entire County is underlain with basaltic rock, some of which has excellent properties for use in road construction. Basalt is easily crushed and, in some cases; is found in such fractured form that little if any crushing is required.

Sand and Gravel

According to the Washington Department of Natural Resources, Benton County's high grade sand and gravel deposits are being depleted at a very rapid rate and may be in short supply in 10-15 years. In addition to the consumption of these resources, a great deal of unused deposits are removed from potential production due to the expansion of urban developments covering the deposits before they are extracted. The major high grade sand and gravel deposits are: (1) in south Kennewick, south of 27th extending east as far as the south Finley area; (2) in the east Kennewick, east of Oak at the Benton-Franklin Fairgrounds; (3) in west Kennewick south and west of Clearwater; (4) along the north and south sides of Highway 12 extending intermittently between Prosser and Benton City: and (5) at the southern boundary of the County along and in the Columbia River. The importance of sand and gravel to the fishery resources of the Columbia River precludes the extensive use of this source for aggregate supplies. All of these general sites are producers of the kind of high grade sand and gravel that is needed for the manufacture of cement and cement products used in the construction industry.

Crushed Rock

Unlike sand and gravel, quarry rock is in ample supply; but not all is high grade material or is close enough to ground surface to economically extract. Much of the quarry rock extracted is crushed for use in street and road construction. The major high grade basalt deposits are: (1) in the north slope of the Horse Heaven Hills south of Finley in the vicinity of Finley Road and Nine Canyon; (2) in the Horse Heaven Hills plateau in the vicinity of Sellards Road southwest of Prosser; and (3) in the vicinity of Four-mile Canyon north of Plymouth. Other good deposits are found south of Badger Canyon in the Horse Heaven Hills Plateau on Clodfelter Road and also south of Prosser in the north slope of the Horse Heaven Hills east of the Painted Hills housing development.

Rate of Use

Data regarding production of aggregate resources is considered confidential by regulatory agencies and, consequently, specific figures are not available. A rough estimate to total County average annual production of sand, gravel and crushed rock is conservatively considered to be in the neighborhood of 300-500 thousand tons. The major use of aggregate resources is for urban and rural residential developments. Construction of both dwellings and road networks consumes substantial amounts of sand and gravel as well as quarried and crushed basalt.

NATURAL HAZARDS

Slopes

Within Benton County there are two major areas of steep slopes (greater than 15 percent) in addition to numerous smaller areas (See Map 6). The two major areas are:

1. The north slopes of the Horse Heaven Hills, which extends across the midsection of the County from the Yakima County line west of Prosser to the Columbia River southeast of the City of Kennewick.

2. The Rattlesnake Hills which run in a northwest-southeasterly alignment along the southwestern boundary of the Hanford Site and extensions of which (e.g. Red Mountain, Candy Mountain, and Badger Mountain) extend to the western fringes of the City of Kennewick.

Slopes of 50 percent can be found in both of the above areas.

Due to the unique problems inherent in development in steeply slopes areas, special care should be exercised in the planning and development of such areas. The cost impacts of slopes on home construction are not particularly under the purview of the County, but an understanding of these factors can lead to a more enlightened land use policy in such areas. In 1976, the Salem, Oregon Homebuilders Association calculated added costs for building a home "in the hills". Their findings are presented in Table 6.

TABLE 6: ESTIMATED EFFECT OF SLOPE UPON COST OF HOME CONSTRUCTION

SLOPE	ADDED COST
0 - 5%	0
6 - 8%	10 - 12%
8 - 12%	50%
12 - 15%	50 - 75%
18+ %	100+ %

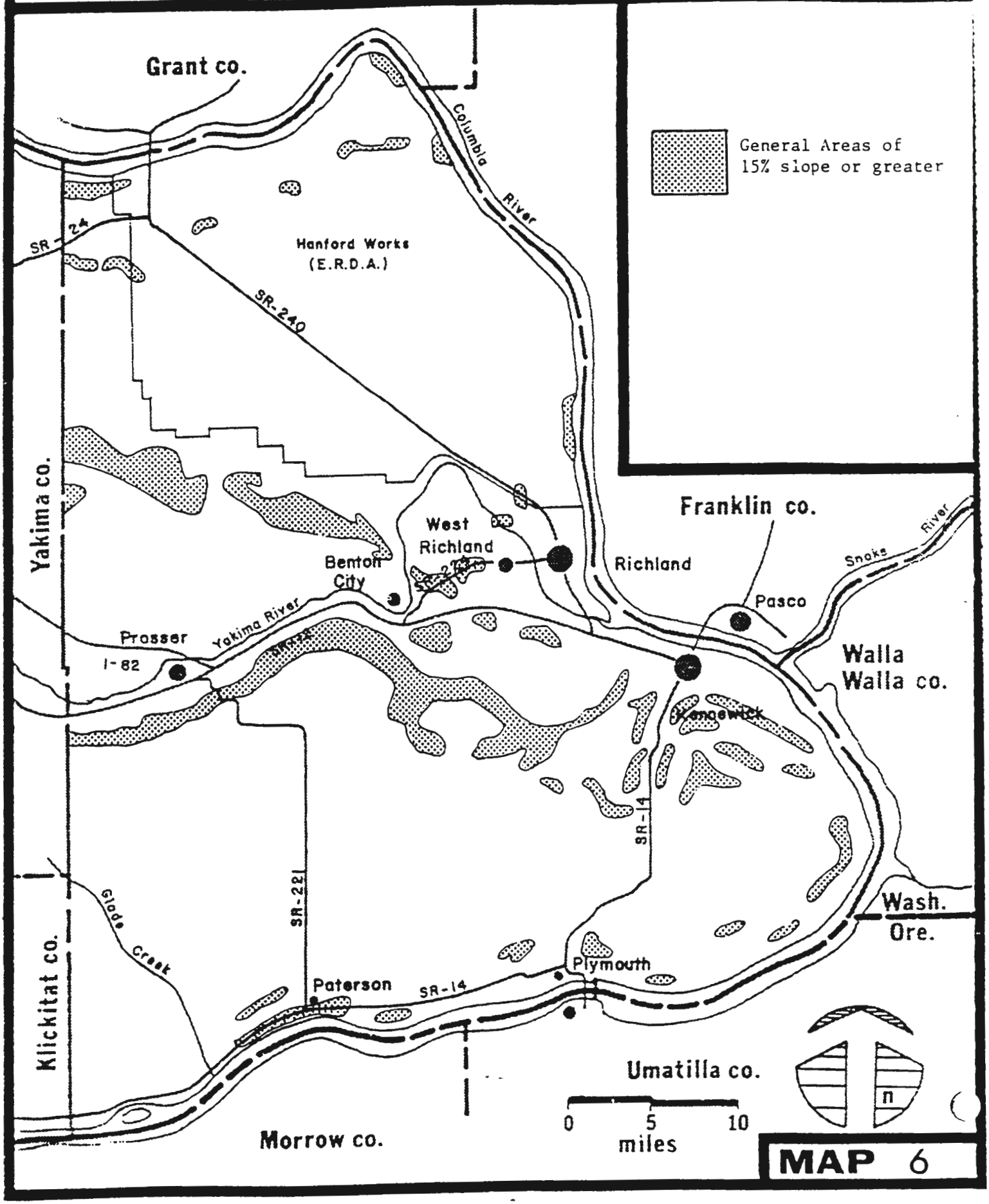
Source: Salem, Oregon Homebuilders Association, 1976

Steep sloped areas have the potential for mass movement and slope erosion hazards. Mass movement is the movement of rock or soil material downslope in response to gravity (hillslides). Slope erosion is the removal of soil or weathered bedrock which occurs as a result of sheet wash (no conspicuous channels), rill erosion (numerous small rivulets) or gully erosion (larger, more nearly permanent channels).

On-site inspection and analysis of steep sloped areas will often be necessary in order to determine the degree of susceptibility of specific locations to these hazards. Any proposed development should not take place on steeply sloped areas without a thorough engineering investigation to determine the extent to which these hazards might be found in the areas proposed for development.

Benton County Comprehensive Plan

Steep Slopes



The Side Hill Development Standards Report, completed for Benton County by a consultant in 1979, examined this problem and recommended a "slope-density" criteria for hillside development in the County. Simply put, this concept calculates the necessary lot size that would be required in order to safely accommodate residential development in steeply sloped areas. The report recommended that the criteria be applied to any proposed development in areas where the slope exceeds 10 percent.

Clearly slope is an important factor to be considered in any development proposal for these types of areas. Important concerns of the County are the appropriate land use designation for steep sloped areas, as well as careful scrutiny of any development proposals for such areas to ensure that there will be no threat to the health, safety, or welfare of the County's citizens as a result of such development.

Flooding

There are areas in Benton County that are subject to flood hazards, the primary area of concern being the flood plain along the Yakima River. The most severe flooding along the Yakima occurs during the winter and spring months as a result of heavy rains and snowmelt runoff on frozen ground. In the West Richland vicinity, flooding is also caused by the simultaneous occurrence of excess runoff and ice jams. Although ice jams are absent from the problems confronting the Kennewick vicinity, problems with regard to frozen, unpenetrable soil do exist, particularly in the Zintel Canyon area. Such soil conditions prevent natural saturation of floodwaters into the soil, forcing water out of natural channels and into lowland areas.

The maximum known flood of the Yakima River occurred in December of 1933 with a depth of approximately 9.5 feet above the top of the river bank at Benton City. The 1933 flood had an estimated recurrence interval of approximately 170 years. Other recent major floods and their recurrence intervals are 1948 (33 year) and 1974 (36 year).

Newspaper reports document major floods in the Zintel Canyon in 1949, 1952, 1956, 1959, and 1964. Flows are confined to the steep, narrow canyon until approximately West Tenth Avenue in Kennewick where the canyon begins to widen into a flat, alluvial fan with no defined stream channel.

There are no flood control measures in operation or planned in the vicinity of Benton City or Prosser. Levees are located on both banks of the Yakima River at its mouth. Additionally, a levee has been constructed from the Van Giesen Bridge at West Richland downstream for approximately one mile. There are currently no flood protection works in operation in Zintel Canyon. Although the U.S. Congress has approved construction of a flood control dam for the canyon, to date no funding has been allocated.

The Benton County Planning Department has mapped certain areas in the County where the potential for flood and flash flood activity exists. These areas are shown on the Environmentally Sensitive Areas Maps at the end of this Element. Due to the scale required, the areas shown are somewhat generalized. For maps of a more site specific detail, the flood hazard maps prepared by the Federal Emergency Management Agency and referred to below should be utilized.

Flood Plain Management*

One of the products of the Federal Emergency Management Agency's (FEMA) flood insurance program has been the mapping of flood hazard areas throughout the nation. The primary area of concern in this effort has been the 100 year flood hazard area. This area can be defined as the land in a floodplain having a one percent or greater chance of flooding in any given year based upon the concept that a 100 year flood has a one percent chance of being equalled or exceeded during any given year.

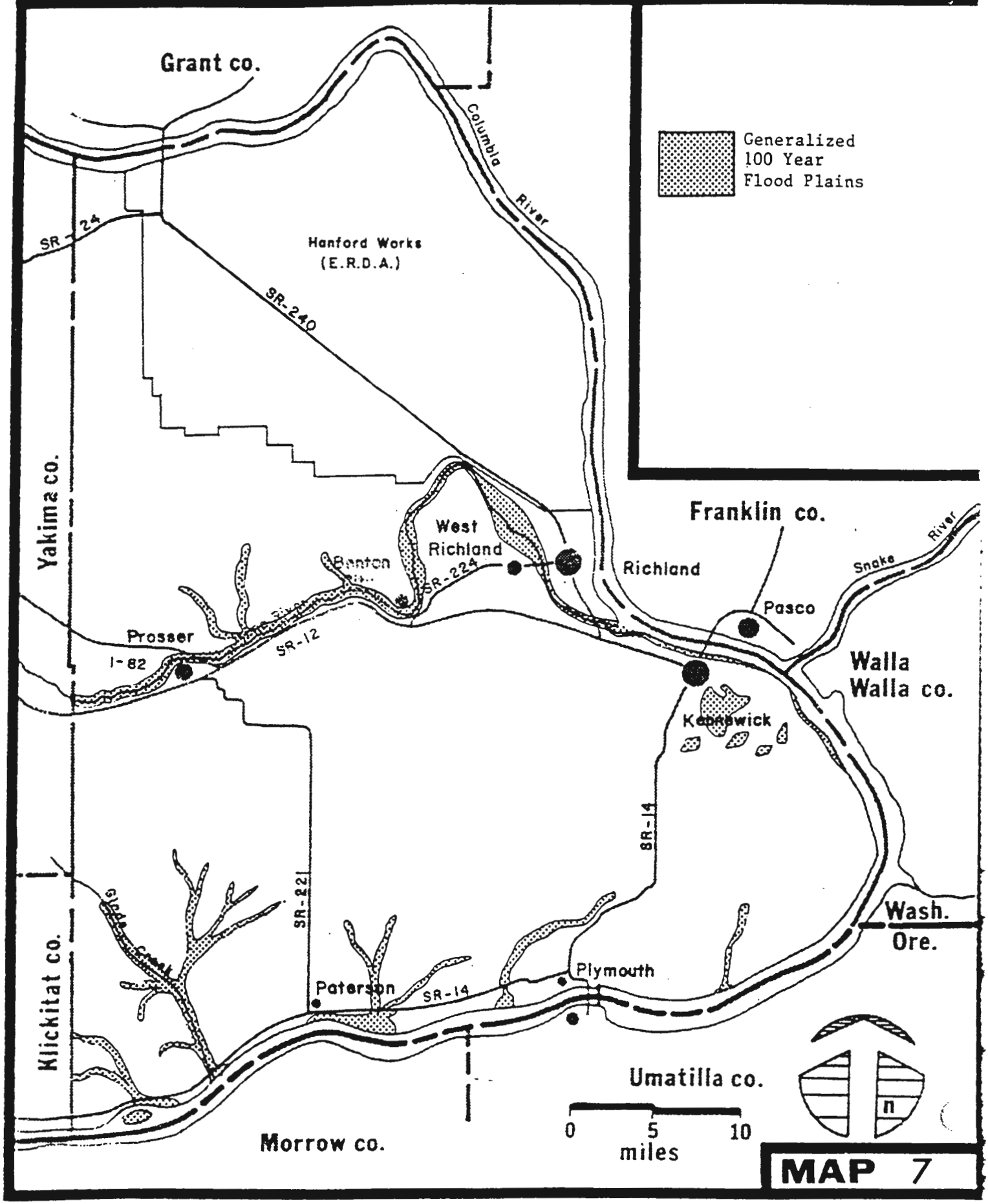
It should be noted that rare floods could exceed the 100 year flood and that the risk of experiencing a rare flood increases when periods greater than one year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (one percent chance of annual occurrence) in any 50-year period, is approximately 40 percent (four in 10), and, for any 90-year period, the risk increases to approximately 60 percent (six in 10). The 100-year flood has been adopted by FEMA as the base flood for purposes of flood plain management measures.

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity and increases flood heights, thus increasing flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain

*Much of the information discussed in this section has been extracted from material provided by the Federal Emergency Management Agency (FEMA).

Benton County Comprehensive Plan

Flood Hazard Areas



MAP 7

development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent flood plain areas, that must be kept free of encroachment in order that the 100-year flood be carried without substantial increases in flood heights. A minimum standards, the Federal Insurance Administration limits such increases in flood heights to one foot, provided that hazardous velocities are not produced.

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than one foot at any point. Practice in Benton County has been to allow development in the floodway fringe if structures are located at flood level or higher at first floor level.

For a generalized map of 100-year flood hazards areas in Benton County, see Map 7.

Seismicity

Benton County is located within a Seismic Zone II according to the Uniform Building Code Seismic Risk Map. This indicates that earthquakes up to Intensity VII on the MOdified Mercalli (MM) Scale can be expected to occur in the county. This would correspond with a 5.5-6.1 event on the Richter Scale and, as is shown on Table 7, is not an inconsiderable event. A description of the range of earthquake intensities is provided in the table to lend perspective to the degree of risk found in Benton County.

ENVIRONMENTALLY SENSITIVE AREAS

This element of the Comprehensive Plan has discussed those physical features found in the County that need to be identified and dealt with in the planning process because of their special characteristics in regard to development. The State Environmental Policy Act (SEPA) Guidelines (WAC 197-11) and the Benton County ordinance implementing those guidelines (Benton County Ordinance No 182) provide an additional means for incorporating an awareness of these areas into the County planning process so that the health and safety of the County's citizens will not be unduly jeopardized. Specifically, the SEPA Guidelines and County Ordinance 182 give Benton County the authority to designate areas within its jurisdiction which are environmentally sensitive. Environmentally sensitive areas are lands wherein unregulated or incompatible development could result in significant damage to the environment, life, property or the long-term public interest. The Plan recognizes the importance of identifying and protecting areas subject to natural disasters and hazards by designating and mapping such lands as Environmentally Sensitive Areas (See Maps 8-12). Plan policy stipulates that site specific studies be performed by prospective developers when developments are proposed for sites located in areas designated as "Environmentally Sensitive" on the maps at the end of this Element. These studies shall (1) assess development suitability and carrying capacity of the site, (2) identify the environmental impacts of the proposals on the sites, and (3) identify mitigating measures to be taken by the developer.

The State Law and County ordinance also authorize the County to select certain activities which are currently exempt from the requirements of State and County environmental policy law, and require these activities to be reviewed if located within designated environmentally sensitive areas. Such activities locating within designated environmentally sensitive areas in Benton County which will not be exempt from the requirements of State and County environmental law as noted in Benton County Code 6.36.010 through 6.36.145 or thereafter amended or replaced.

Comprehensive Plan policy will be used as a guideline in the designation of such areas and the sensitive area maps will be included in the Comprehensive Plan. Categories of environmentally sensitive areas delineated on the regional sensitive areas maps include the following: steep slopes, landslide, 100-year flood plain and flash flood areas. These categories are defined below. It is important that it be kept in mind that all of these map designations are general in nature and that site specific studies will be required in many cases in order to determine the extent to which the environmentally sensitive condition is present on particular properties.

Steep slopes

Lands characterized by average slopes of 15% and greater. Steep slopes were identified from Benton County Planning Department regional topographical condition maps as determined from United States Geological Survey Quadrangles.

Landslides

Land characterized by landslides that are now stable but could become unstable with man's

activities. Most of the slides identified are relatively old (5,000-20,000 years), but when subject to road cuts, excavation, building development, or irrigation, have the potential for further movement. Landslide areas were identified from Benton County Planning Department regional hazards area maps as determined by a consulting geologist.

100-Year Flood Plain

Land which has been or may be covered with water from a flood the magnitude of which has a 1% chance of occurring in any given year. The 100-year flood plain was identified from the most recent flood insurance rate maps of the Department of Housing and Urban Development, Federal Insurance Administration.

Flash Flood

Gullies and canyons that usually drain large areas and are subject to rapid run-off. Alluvial fans at the mouths of such gullies and canyons are also included where the flash flood stream breaks up and spreads over a wide area. Such alluvial fans are particularly hazardous because of the unpredictable course the flash flood water may take from year to year. Flash flood lands were identified from Benton County Planning Department regional hazards area maps as determined by a consulting geologist.

100-Year Flood Plain and Flash Flood

Lands subject to both 100-year floods and flash floods as described and determined above.

CONCLUSION

The physical features and characteristics of the County have historically had a substantial bearing on the location, type, and density of development in the County. These factors in many cases determine the opportunities for, as well as limitations on the development of the County, and as such are one of the most important areas of concern utilized during formulation of the Comprehensive Plan goals, policies, and maps. By utilizing sound planning and engineering practices in regard to development in and around these areas of natural resources and hazards, development can be accommodated so that resources are protected and hazards to the health and safety of the County's citizens, both present and future generations, are minimized.

CRITICAL FISH AND WILDLIFE HABITAT

In March of 1982, the Lower Columbia Basin Audubon Society completed a study entitled Ecologically Sensitive Areas of Benton County, one of the primary purposes of which was to identify critical fish and wildlife habitat in the County. The study was completed with the assistance of some 30 individuals, agencies, and organizations outside of the local Audubon Society in addition to the members of that organization with significant expertise of their own. Contributors included personnel from such agencies as the Washington Department of Game and the U.S. Fish and Wildlife Service. In accordance with the intent of this Plan to protect the County's environmental quality, the portions of the Audubon Society study that identify and describe critical fish and wildlife habitat are incorporated into this Comprehensive Plan as indicated on Map 13.

In reference to the Critical Fish and Wildlife Habitat, as indicated on map 12-A, these areas are general in nature and do not identify specific boundaries for sensitive habitat areas. Prior to approval or disapproval to any development a more extensive on-site field study may be required to identify whether the area is or is not indeed a critical fish and wildlife habitat area and to determine specific boundaries for critical habitat areas to ensure compatibility outside and within the development project.

CONCLUSION

A variety of uses in and around these habitat areas may result in significant changes to the critical fish and wildlife habitat, however by utilizing sound planning and engineering practices in regard to development in and around these critical fish and wildlife habitat areas, development can be accommodated so not to adversely impact the habitat quality of these areas, thus ensuring natural areas for scientific research, educational and recreational activities for present and future generations to enjoy.

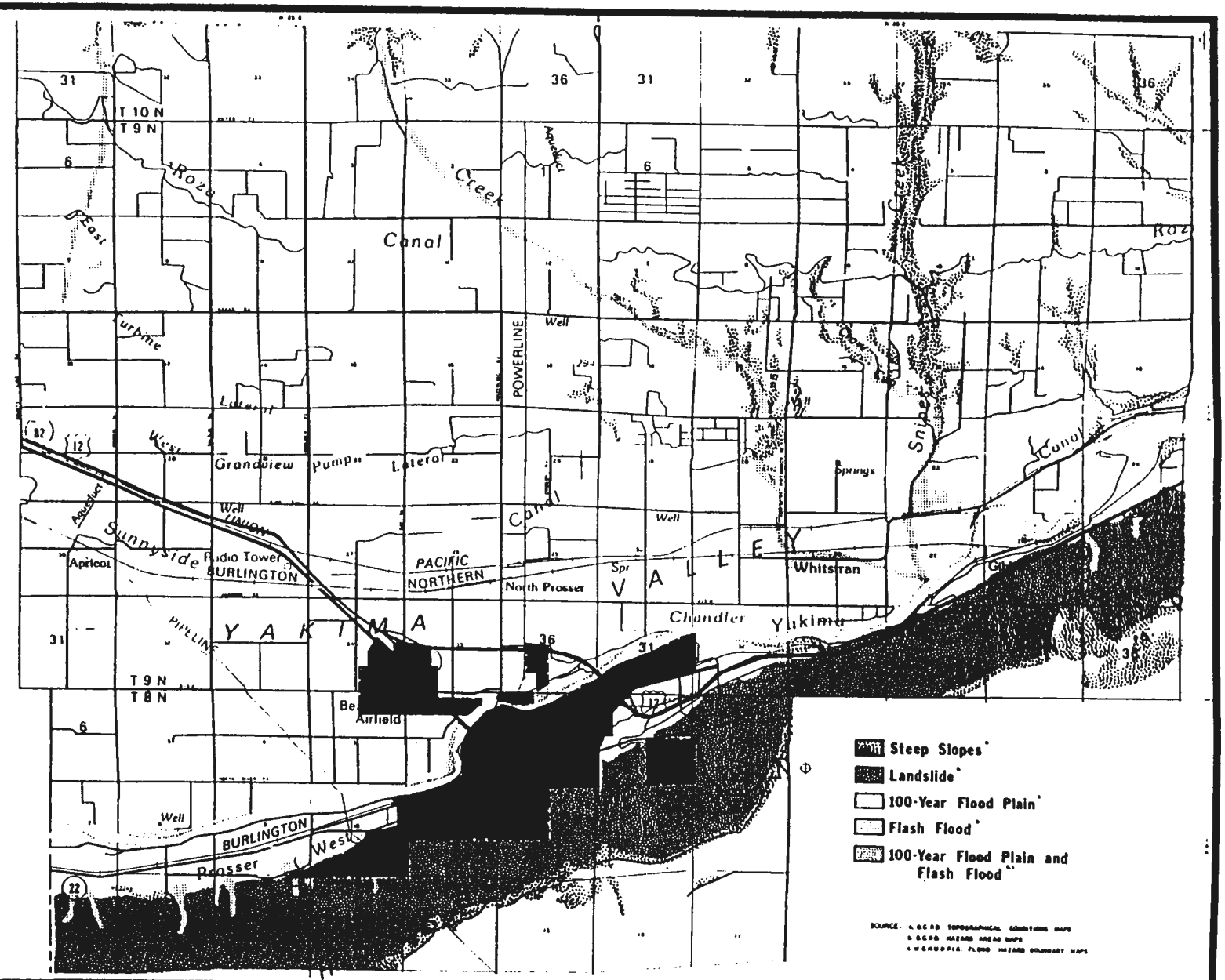
TABLE 7 : SCALE OF EARTHQUAKE INTENSITIES AND MAGNITUDES

Mercalli Intensity	Description of Effects	Equivalent Richter Magnitude
I	Not felt except by a very few under expecially favorable circumstances	
II	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.	3.5
III	Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize as an earthquake. Standing motor cars may rock slightly. Vibration like passing of truck. Duration estimated.	to 4.2
IV	During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building; standing motor cars rock noticeably.	4.3
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. A few instances of cracked plaster; unstable objects overturned. Some disturbance of trees, poles, and other tall objects noticed. Pendulum clocks may stop.	to 4.8
VI	Felt by all; many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.	4.9-5.4
VII	Everyone runs outdoors. Damage negligible in buildings of good design and construction, slight to moderate in well-built ordinary structures, considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.	5.5-6.1
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.	6.2 to
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.	6.9
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river bank and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.	7.0-7.3
XI	Few if any (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	7.4-8.1
XII	Damage total. Waves seen on ground surfaces. Lines of sight and level distorted. Objects thrown upward into the air.	Max. recorded 8.9

Source: Jackson County Comprehensive Plan; Medford, Oregon, 1980

SENSITIVE AREAS

MAP 8

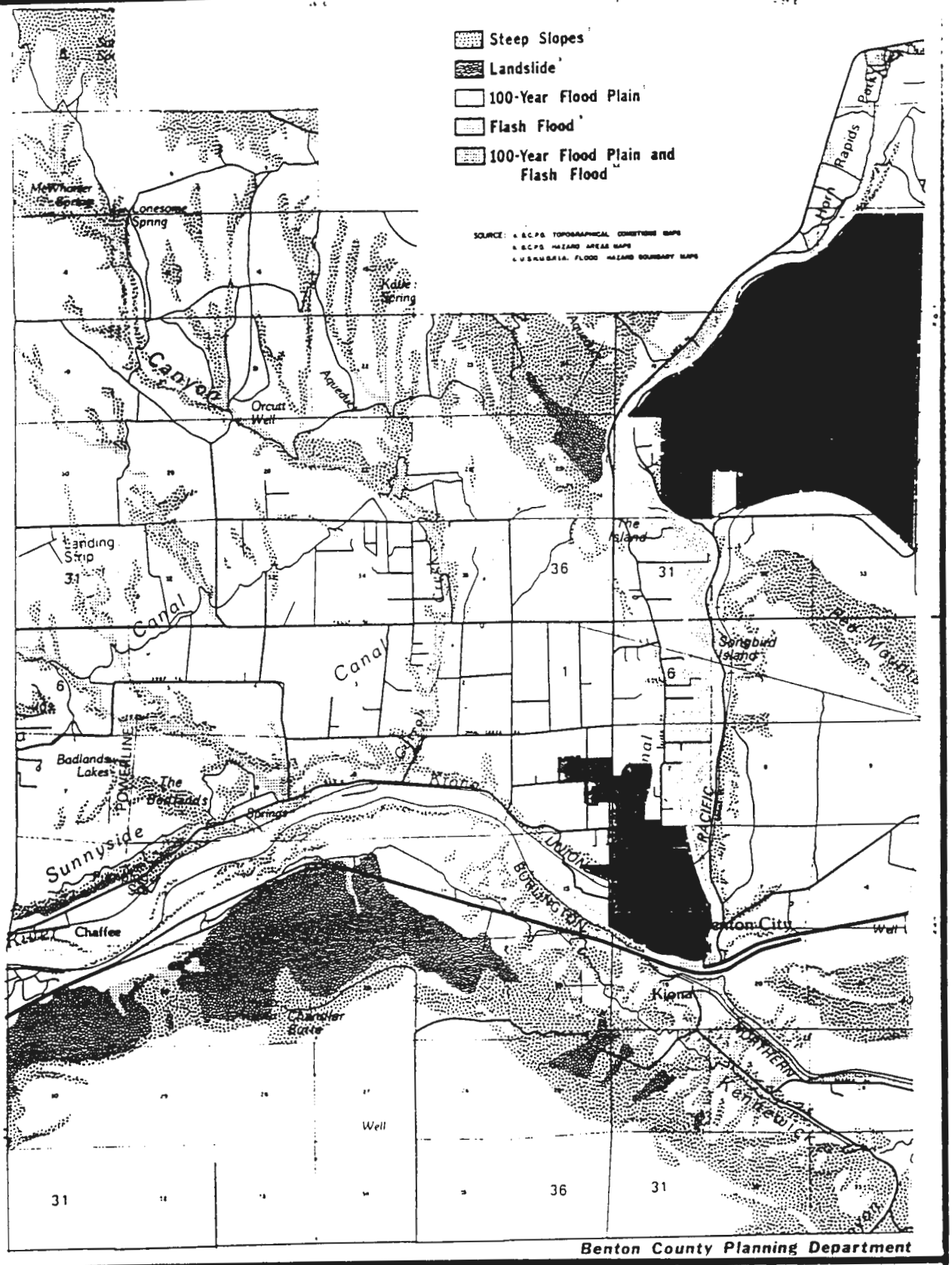


PROSSER - ROZA

Benton County Planning Department

SENSITIVE AREAS

MAP 9

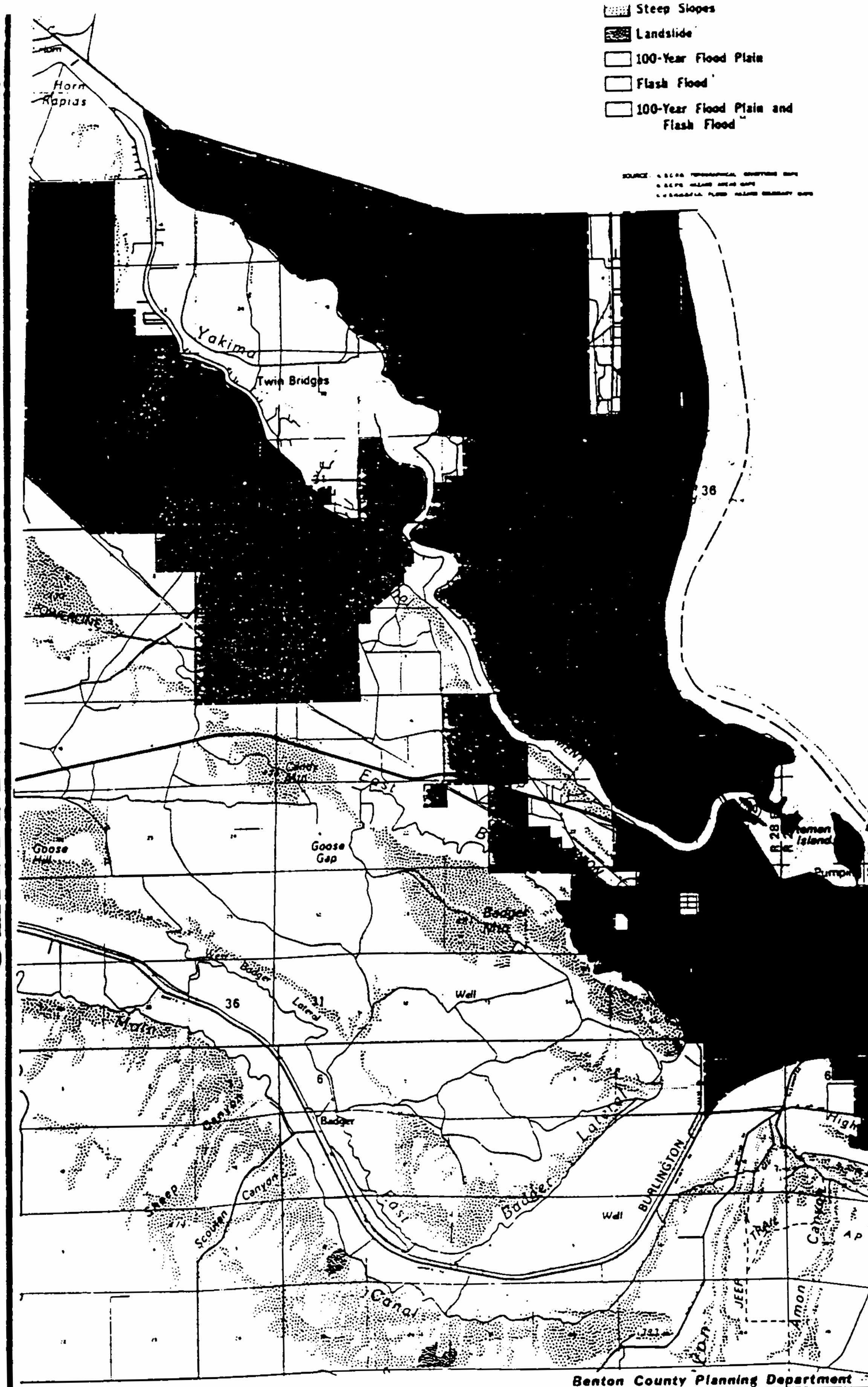


Benton County Planning Department

BENTON CITY - KIONA

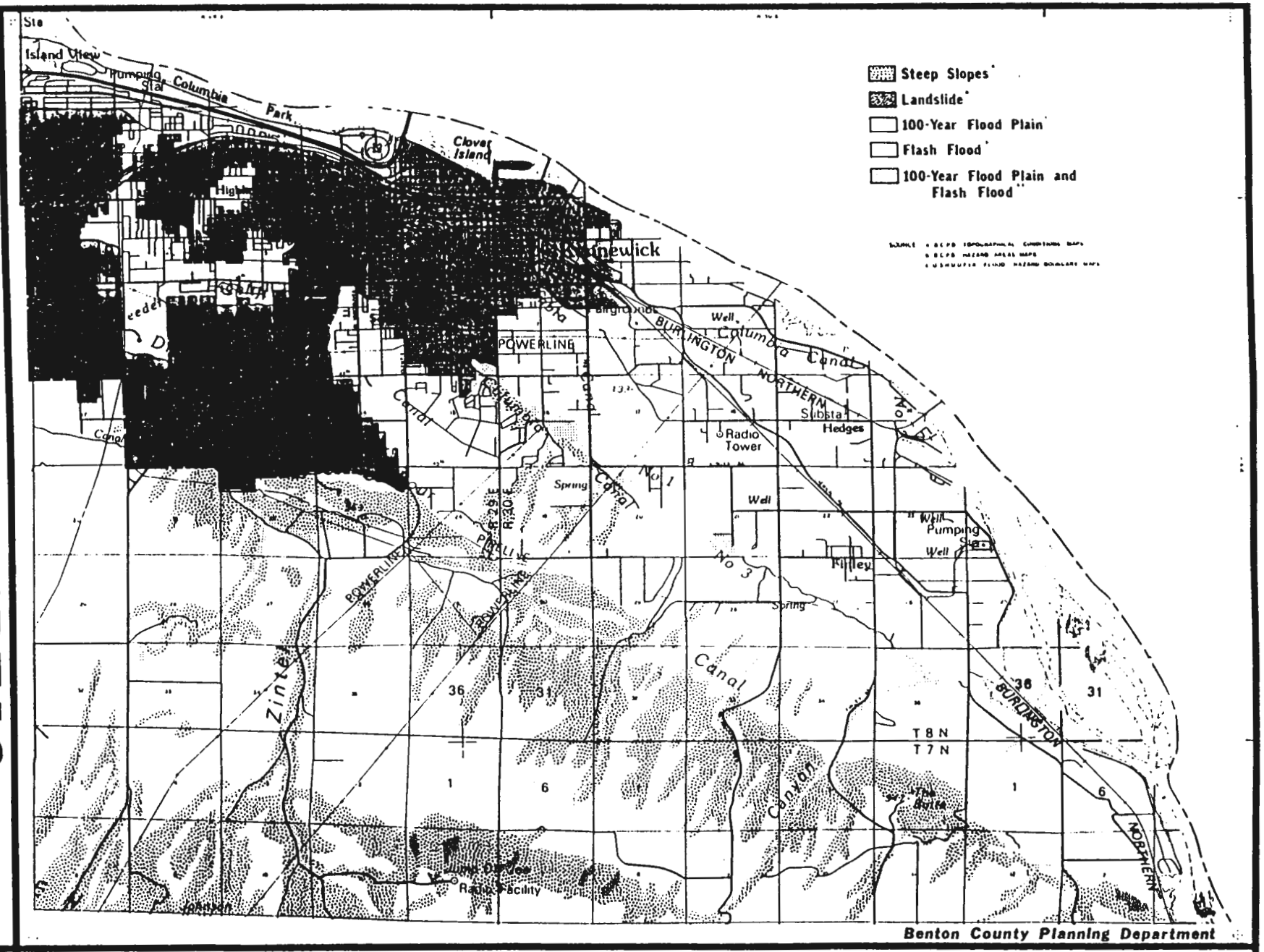
MAP 10

SENSITIVE AREAS



RICHLAND - WEST RICHLAND

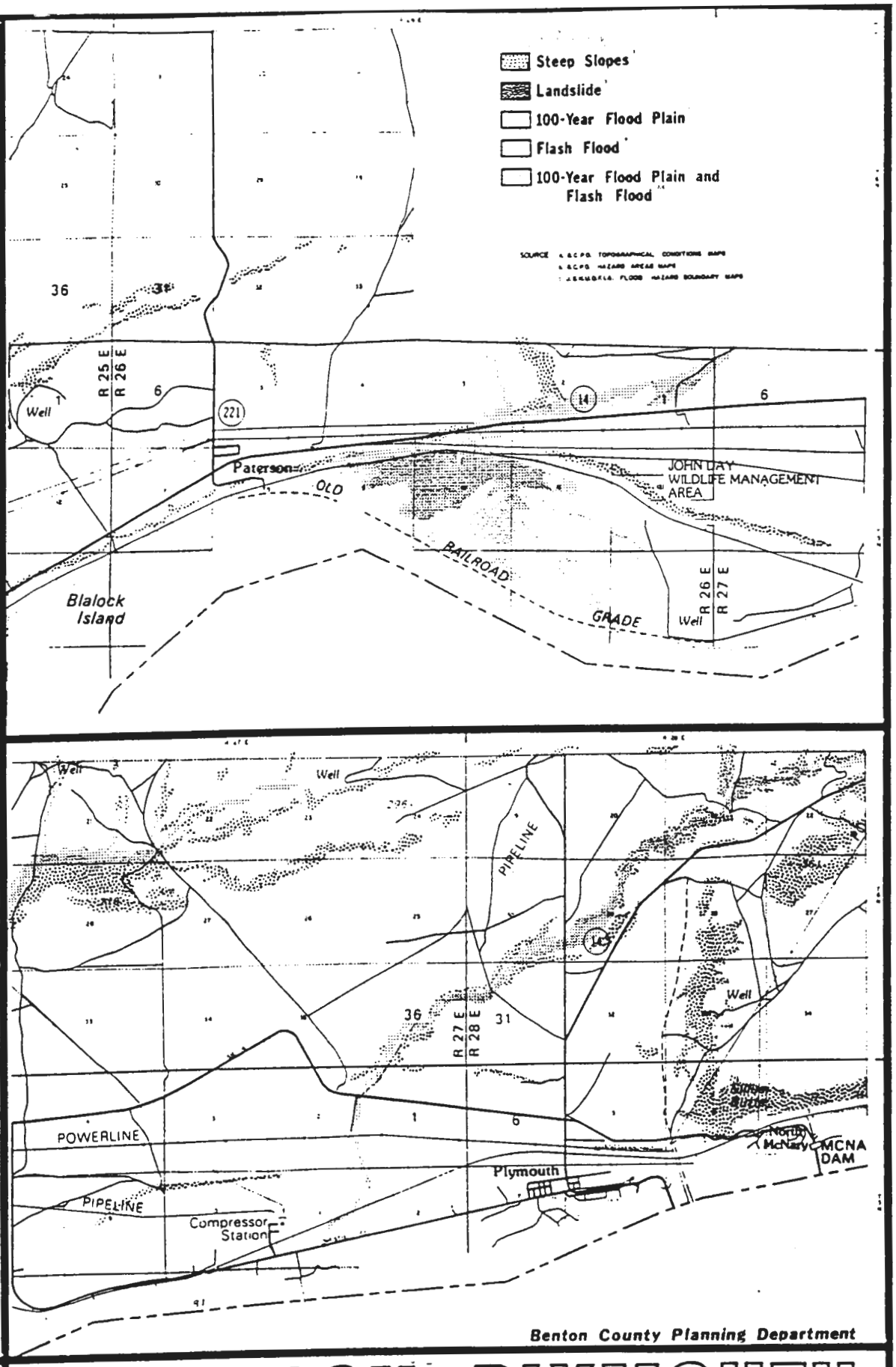
SENSITIVE AREAS MAP 11



KENNEWICK - FINLEY

SENSITIVE AREAS

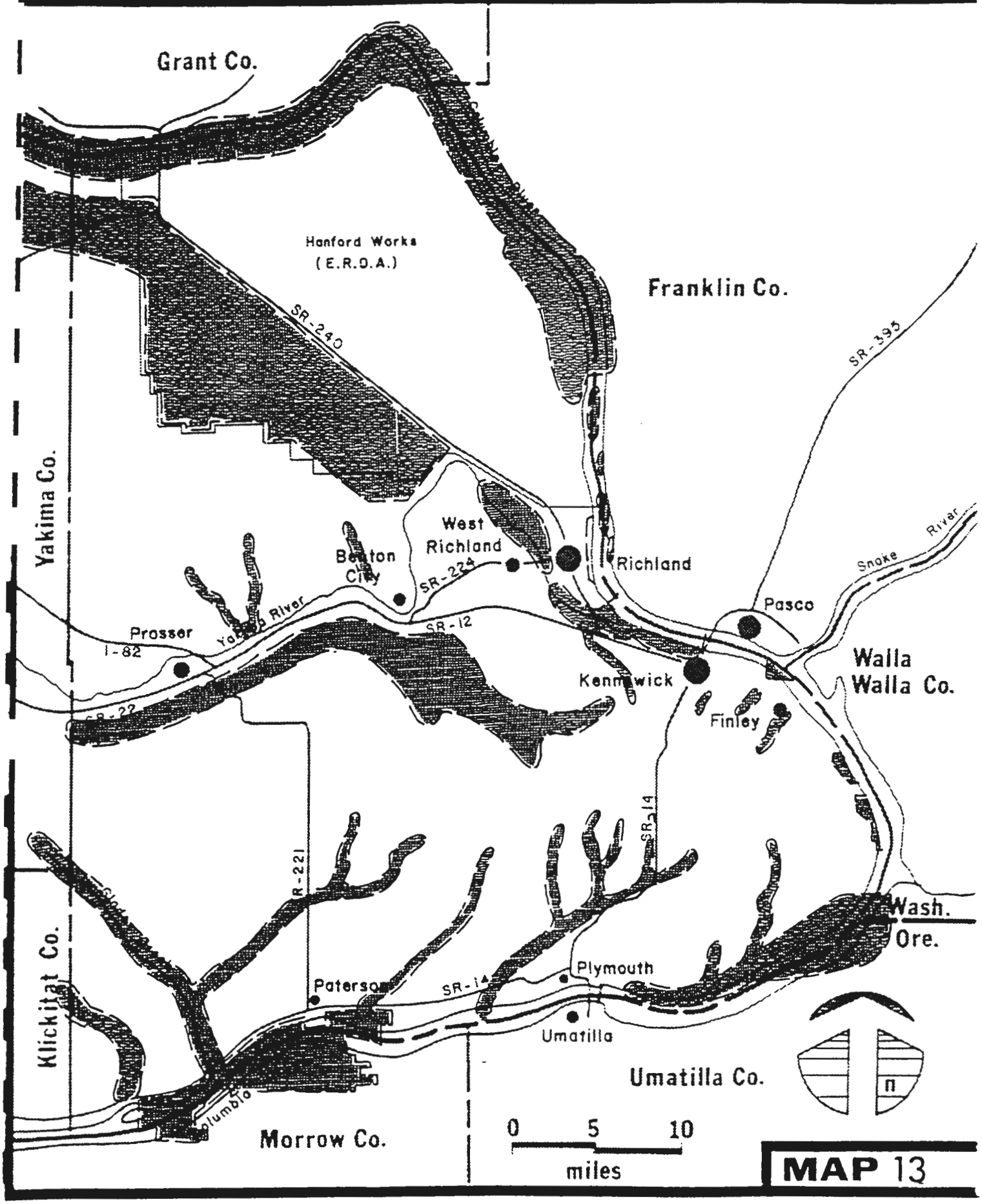
MAP 12



PATERSON - PLYMOUTH

Benton County Comprehensive Plan

Fish and Wildlife Critical Habitat Areas



CHAPTER V

ENVIRONMENTAL QUALITY ELEMENT

INTRODUCTION

To a large extent, the "livability" of an area is a function of the quality of the physical environment found in that area. The complicating factor is that almost any human activity involves some impact on the environment. It is to be expected in developing areas such as Benton County that the natural environment will be subservient to these human activities. Nevertheless, social awareness of environmental issues has increased to the point that large segments of the population are concerned about such environmental aspects of their communities as clean air and water. Primary areas of concern in this regard are the quality of air, water, and land resources; as well as problems associated with excessive noise.

As Benton County continues to develop over the long-range planning period, decisions will have to be made regarding trade-offs between protecting the environment and proceeding with development activities that will almost inevitably have some degree of adverse impact upon that environment. This element of the Comprehensive Plan presents an analysis of these issues that will hopefully be of assistance to the County's decision-makers as they deal with these problems.

The State Environmental Policy Act that was passed in 1971, and the resulting environmental impact statement (EIS) requirements, essentially require proposed major developments to identify significant adverse environmental impacts that can be expected to result from the proposed development. The information provided can then be used by the elected and appointed decision-makers during the review and approval process. An EIS has been prepared for this Comprehensive Plan and although much of the background data used in this Element of the Plan is the same as that used in the EIS, the two documents serve different purposes. The EIS identifies the impacts on the environment that can be expected to occur if the Comprehensive Plan is adopted. This Environmental Quality Element of the Comprehensive Plan presents the environmental data and analyses that together were used as one of the many factors that led to the goals, policies, recommendations and maps that are important guidelines of the Plan.

AIR QUALITY

General

The air quality in Benton County is generally good with the exception of suspended particulates (TSP). The State and Federal governments have set standards for a number of air pollutants including suspended particulates, sulfur dioxide, carbon monoxide, photochemical oxidents, nitrogen dioxide, hydrocarbons, and lead (See Table 8 for a description of most of these pollutants). Benton County has had difficulty in meeting the standards of only one of these - total suspended particulates.

In February, 1978, the U.S. Environmental Protection Agency (EPA) announced that the Tri-Cities was one of 23 urban/industrial areas in the Pacific Northwest which had failed to attain national air quality standards. Specifically, the Tri-Cities had failed to meet the annual primary standard for TSP. In non-attainment areas, EPA requires that before a new pollutant source locates in the area, its emissions must be "offset" by emmission reductions from other sources (the "offset rule"). This policy effectively limits heavy industrial growth in air polluted areas until measures are taken to improve the air quality in such areas.

In July, 1978, EPA rescinded the non-attainment designation when it determined that the primary source of the Tri-Cities' air pollution problem was windblown dust rather than industrial activities. EPA determined that implementation of the offset rule would not significantly improve air quality in the area since existing industry was a minor contributor to air pollution, and any decrease in emmissions from existing industry would not be a significant factor in reducing TSP levels.

Although windblown dust from agricultural fields is the single largest contributor to air pollution in the area, it is not the sole cause of high TSP levels. The Tri-County Air Pollution Control Authority (TCAPCA) 1978 Annual Report stated the following:

> "There is . . . considerable evidence that slash burns and forest fires in and west of the Cascade Mountains of both Oregon and Washington can augment TSP in the Tri-Counties. The Horse Heaven Hills in the southern part of Benton County export huge quantities of dust not only into the Tri-Cities, but also into all other downwind portions of Eastern Washington and Northern Idaho. There are also occasions when wind blowing from the opposite direction carries dust into the Tri-Cities from agricultural sources to the north and northeast."

TABLE 8: AIR POLLUTANT DESCRIPTIONS AND EFFECTS

POLLUTANT	WHAT IT IS	WHAT IT IS FROM	WHAT DAMAGE IT CAUSES
Suspended Particulates	Solid and liquid particles of soot, dust, aerosols, and fumes ranging from 0.01 to 100 microns and average about 2 microns in size (1 micron = 1/2540")	Combustion sources, cars, industry process losses, fugitive dust, field and slash burning, and natural sources, such as ocean spray and wind-raised dust	Aggravates chronic lung disease, heart and lung material damage and visibility reduction
Sulfur Dioxide	A colorless, pungent, irritating gas	Oil and coal combustion and industry process losses	Aggravates asthma, heart, and lung disease in the elderly; irritates lungs, corrosive to metals and marble; causes plant damage
Carbon Monoxide	A colorless, odorless gas that is highly toxic	Incomplete combustion sources, mostly cars	Interferes with the blood's ability to carry oxygen, causing heart difficulties in those with chronic diseases; reduces lung capacity; impairs mental abilities
Photochemical Oxidants	Mostly consists of ozone, which is a toxic gas	Photochemical processes in the atmosphere by reaction between oxides of nitrogen and hydrocarbons in the presence of sunlight	Irritates eyes, causes damage to lung tissue and impairs lung function; causes material and plant damage
Nitrogen Dioxide	A reddish-brown gas toxic in high concentrations	Conversion of nitric oxide (from autos and combustion sources) and industrial sources	Increases chronic bronchitis and irritates lungs
Hydrocarbons	A large family of compounds consisting of hydrogen and carbon	Autos, evaporative fuel losses, industry and combustion processes	Participates in oxidant formation and causes plant damage (Methane is produced naturally by decay of organic matter and is not significant in oxidant formation)

Source: Handbook for Environmental Quality Elements of Land Use Plans, Oregon State Department of Environmental Quality, 1978.

In its 1978 Annual Report, the TCAPCA made the following findings regarding windblown dust - the most significant component of Benton County's TSP problem:

1. Windblown dust is not a natural phenomenon and much can be done to control it.

2. Essentially all suspended dust particles are respirable.

3. Farm fields are by far the most important potential sources of blowing dust, but much can be done to reduce it.

4. Blowing dust from a construction project can be considerably reduced by clearing the land in one small parcel at a time instead of clearing the entire area of development at one time.

5. Line sources in the form of unpaved roads are relatively unimportant sources of dust when compared to equivalent area sources in the form of insufficiently protected farm fields.

Although the major sources of air pollution in the County are those non-point sources described above, some air pollution is the result of point source emissions from industrial activities. Table 9 lists point sources of emmissions according to source, location, amount, and type, for 1979 as identified in the TCAPCA annual report issued in 1980.

Monitoring and Control

All three levels of government are involved in air quality monitoring and control in Benton County with the Environmental Protection Agency (EPA) at the federal level, the Department of Ecology (DOE) at the state level, and the Tri-County Air Pollution Control Authority (TCAPCA) at the local level. There are three TSP monitoring stations in Benton County - one each at Kennewick, Richland, and the Hanford Site.

Benton County is fortunate to have an airshed that is relatively clean except for what is essentially a windblown dust problem. Hopefully the air quality will be maintained at this level or better. The adverse effects of air pollution are clear and have been recognized for some time. Numerous private and government studies have indicated that there is a direct relationship between air pollution and human health problems. Diseases known to be related to air contaminants include bronchitis, emphysema, pneumonia, asthma, tuberculosis, cancer, and cardio-vascular diseases.

Air pollution also has adverse impacts upon forest and agricultural resources. Studies conducted by the U.S. Forest Service have indicated that in the Los Angeles area over 100,000 acres of forest lands in the San Bernardino and Angeles National Forests have been adversly affected by smog. There have also been numerous reports of damage to agricultural crops due to air pollution. A 1971 Stanford Research Institute study estimated annual damage to vegetation to be approximately $132 million. Air pollution also damages stone, metals, plastics, leather, fabrics, paint and rubber.

While it is difficult to estimate the total costs of air pollution when including such factors as increased medical expenses, etc., the Federal government has estimated that the annual cost of air pollution is in the billions of dollars. Hopefully Benton County will be able to avoid this scenario by maintaining the high quality of its airshed.

WATER QUALITY

Surface Water

The two major water resources in Benton County are the Columbia River and the Yakima River. Water quality monitoring and control for all rivers and streams in the State of Washington is the joint responsibility of the federal Environmental Protection Agency (EPA) and the State Department of Ecology (DOE). The Characteristics analyzed by EPA and DOE to evaluate the water quality of the State's rivers and streams are summarized in Table 10.

Columbia River

The Columbia River forms Benton County's northern, eastern, and southern boundaries. This river system has a tremendous influence on the County as it does upon the entire Pacific Northwest. The Columbia River Drainage Basin covers most of the states of Washington, Oregon and Idaho. In all, the river drains approximately 259,000 acres, including portions of seven states and Canada as it flows along its 1,214 mile course (See Map 14).

TABLE 9: POINT SOURCE EMISSIONS IN BENTON COUNTY - 1979

SOURCE AND LOCATION	EMMISSIONS (tons/yr)*				
	Part.	SO	NO	HC	CO
No. Pacific Grain, Kennewick	43	0	0	0	0
Chevron Chemical, Kennewick	1285	1000	2990	4	3
Central Pre-Mix, Kennewick	3	0	0	0	0
Central Pre-Mix, Richland	2	0	0	0	0
Midland Rock, Richland	70	0	0	0	0
Philips Pacific Chemical, Kennewick	7	0	845	0	0
Acme Concrete, Richland	154	0	0	0	0
Hanford Sources					
UNI Blr., 200 W Area	44	506	152	6	8
UNI Blrs., 2 & 3 100-N Area	3	14	17	0	1
Eng. Dev. Lab Blr. 2, 300 Area	2	65	17	0	0
Eng. Dev. Lab Blr. 3, 300 Area	2	35	23	2	3
Eng. Dev. Lab Blr. 4, 300 Area	1	14	24	1	1
Eng. Dev. Lab Blr. 5, 300 Area	5	100	80	4	7
Eng. Dev. Lab Blr. 6, 300 Area	6	30	40	2	2
Pathology Incin., 300 Area	0	0	0	0	0
J.A. Jones Blrs., 1 & 2, 3000 Area	0	9	8	0	0
Rockwell #1, 5 Blrs., 200 E. Area	2400	538	303	30	40
Rockwell #2, 4 Blrs., 200 W. Area	2300	421	237	10	32
Rockwell #3, (Shutdown May, 1979)	0	0	0	0	0
Rockwell #4, Dist., 1100 Area	1	4	7	1	0
Rockwell #5, Dist., 1100 Area	1	2	3	0	0
Fugitive emmissions	320	0	0	0	0
Plant total from all sources	5085	1738	911	56	94
Tri-City Paving, Kennewick	190	0	0	0	0
Tri-City Paving, Richland	10	0	0	0	0
River Grain, Kennewick	4	0	0	0	0
County Total	6853	2738	4746	60	97

*Part. = suspended particulates, SO - Sulphur oxide, NO = Nitric oxide, HC= Hydrocarbons, CO = Carbon monoxide

Source: Annual Report, Tri-County Air Pollution Control Authority, 1979; September 1980

The extent of this river system which is so important to Benton County points out the regional nature of the water quality issue. The Columbia River flows through nine counties in Washington before it gets to Benton County. In this regard, a water quality problem upstream from Benton County is also a water quality problem for Benton County.

As it approaches the northwest corner of Benton County, the Columbia is turned eastward from its southerly course by the Umtanum Ridge. Upon clearing the easternmost extension of this ridge (Gable Mountain), the river resumes its southerly course, being joined by the Yakima River from the west and the Snake River from the east in the vicinity of the Tri-Cities. Approximately 12 miles downstream from its confluence with the Snake, the Columbia is joined by the Walla Walla River just prior to cutting across the Horse Heaven Hills ridge at Wallula Gap. From this point the Columbia begins its 300 mile westerly course to the Pacific Ocean.

Middle Columbia River - For purpose of discussion in this Element of the Comprehensive Plan, the Columbia River is divided into two segments - the middle Columbia, upstream from its confluence with the Snake River, and the lower Columbia, downstream from that point. An EIS was prepared for the proposed Priest Rapids Dam Expansion Project in 1980 that contained an evaluation of the water quality of the middle Columbia River. Much of the following information has been extracted from that evaluation.

The EIS found that the water quality of the middle Columbia River is generally good although there is some algae growth, nitrogen supersaturation, modification of water temperature, and sedimentation. Nutrients from irrigated lands promote algae growth within various river reaches in this area, and nitrogen supersaturation continues to be a concern, although a shift in the operation of the mid-Columbia dams away from spills has reduced this contribution to the dissolved gases in the river. High temperature continues to a problem because of the high rate of summer insolation over this relatively barren reach of the river.

Irrigation return water poses something of a problem as a result of the higher temperature and higher nutrient content of such waters as they flow into the Columbia. This stretch of the river also experiences some localized high turbidity as a result of bank erosion, irrigation return water, and algae growth.

In general, the EIS found that the water quality at Vernita Bridge was good with generally low turbidity, conductivity, suspended sediments, and nutrients. Temperature levels in the midsummer approached 68° F.

The State of Washington has developed a classification system for its surface waters based upon the types of uses that these waters are to be capable of supporting. River and streams are broken down into four classifications as shown on table 11.

The middle Columbia River is designated as a Class A river by the State. The water quality data evaluated by the Priest Rapids Dam project indicated that the criteria for an "A" classification for this stretch of the Columbia were probably being met with the exception of high water temperature in late summer.

The Washington Environmental Quality Profile prepared by EPA in 1979 evaluated water quality values for Washington's principal rivers for the previous six years. The findings regarding the Columbia River from the Canadian border to its confluence with the Yakima River were that on an average annual basis, this stretch of the river had either no pollution or minimal pollution and therefore met the goals of the Federal Water Pollution Control Act. It is also of interest to note the results of EPA monitoring data on radiation in the Columbia at Richland. As stated in the 1979 report "radiation levels are less than three percent of the drinking water standard, well below any level of concern.

Lower Columbia River - The remainder of the Columbia River in the Benton County vicinity consists of two man-maoe lakes: Lake Umatilla which is created by John Day Dam in Klickitat County and which extends upstream to the community of Plymouth, and Lake Wallula which is created by McNary Dam and which extends upstream as far as the City of Richland.

The water quality of this stretch of the Columbia is of special interest insomuch as it as flowed through the Tri-Cities metropoliton area where it could be expected to receive pollutants. In May 1981, a Draft EIS was completed by the consulting firm of CH2M Hill for a proposed ethyl alcohol facility to be located at the Hover Industrial Park approximately 14 miles downstream from the City of Kennewick. That document included an analysis of the water quality of the Columbia River in the vicinity. The findings of the study were as follows:

> "Water flows are recorded downstream from McNary Dam near Umatilla, Oregon. Average monthly flows recorded from 1970 to 1979 ranged from a high of 550,000 cfs in June 1972 to a low of 91,000 cfs in July 1977. The minimum instantaneous flow recorded was 39,500 cfs, in July 1977. Little information is available on the circulation or flow in Lake Wallula.

incompatible with the desired future and/or existing residential character of such areas. Designation of planned residential densities is important in the fringe areas of urban centers because planning for transportation needs, municipal water and sewer services, school facility needs, fire protection needs and other capital improvement needs is contingent upon knowing the future population densities of the areas to be served. Because premature residential development in rural areas is incompatible with rural living and farming operations and practices, low, medium and high density residential uses shall not be designated outside urban growth boundaries, except within or adjacent to the unincorporated communities of Finley, Kiona, Paterson, Plymouth and Whitstran.

Determination of the suitability of lands for the various categories of residential use was primarily based upon the following factors: (1) existing land use; (2) ownership patterns; (3) average ground slope conditions; (4) location of environmentally sensitive areas; (5) distance from urban centers; and (6) occurrence of preliminary subdivision activity. Determination of desirability was based upon citizen concerns and city and agency input. An attempt was made to designate classifications which will facilitate incorporation of these lands into the cities either prior to or subsequent to their development.

Low Density Residential (LDR)

The most restrictive of the three classifications of residential use is the low density residential classification. This classification provides for residential developments of no greater density than three units per gross acre. Unlike the medium and high density residential categories, whose allowed densities would require community water and waste treatment systems for developments constructed at the higher density levels, the low density residential classification provides for areas to develop at urban densities without the availability of municipal or community waste treatment facilities (provided adequate on-site conditions warrant such development). This allows the smaller communities to expand at urban densities prior to the establishment of municipal services and also allows infilling in bypassed urban areas where municipal services may not yet be established. Most importantly, the low density classification provides protection to existing and future developments desiring to maintain a low density character. Low density residential designations are found in the Benton City, Finley, Kiona, Paterson, Prosser, Kennewick, Richland, and West Richland vicinities.

Medium Density Residential (MDR)

The medium density residential classification has a maximum allowed development density of six units per gross acre. Lands designated with this classification are located in the Kennewick, Paterson, Plymouth, Richland, and West Richland vicinities and are shown on the Kennewick/Finley, Paterson/Plymouth, and Richland/West Richland regional land use plan maps.

High Density Residential (HDR)

High density residential is the least restrictive residential classification, allowing up to sixteen dwelling units to be developed per gross acre of land. The classification is shown designated on the Paterson/Plymouth regional land use plan maps. All of these lands are characterized by relatively flat relief and are either surrounded by, adjacent to , or within urban areas.

Neighborhood Commercial (NC)

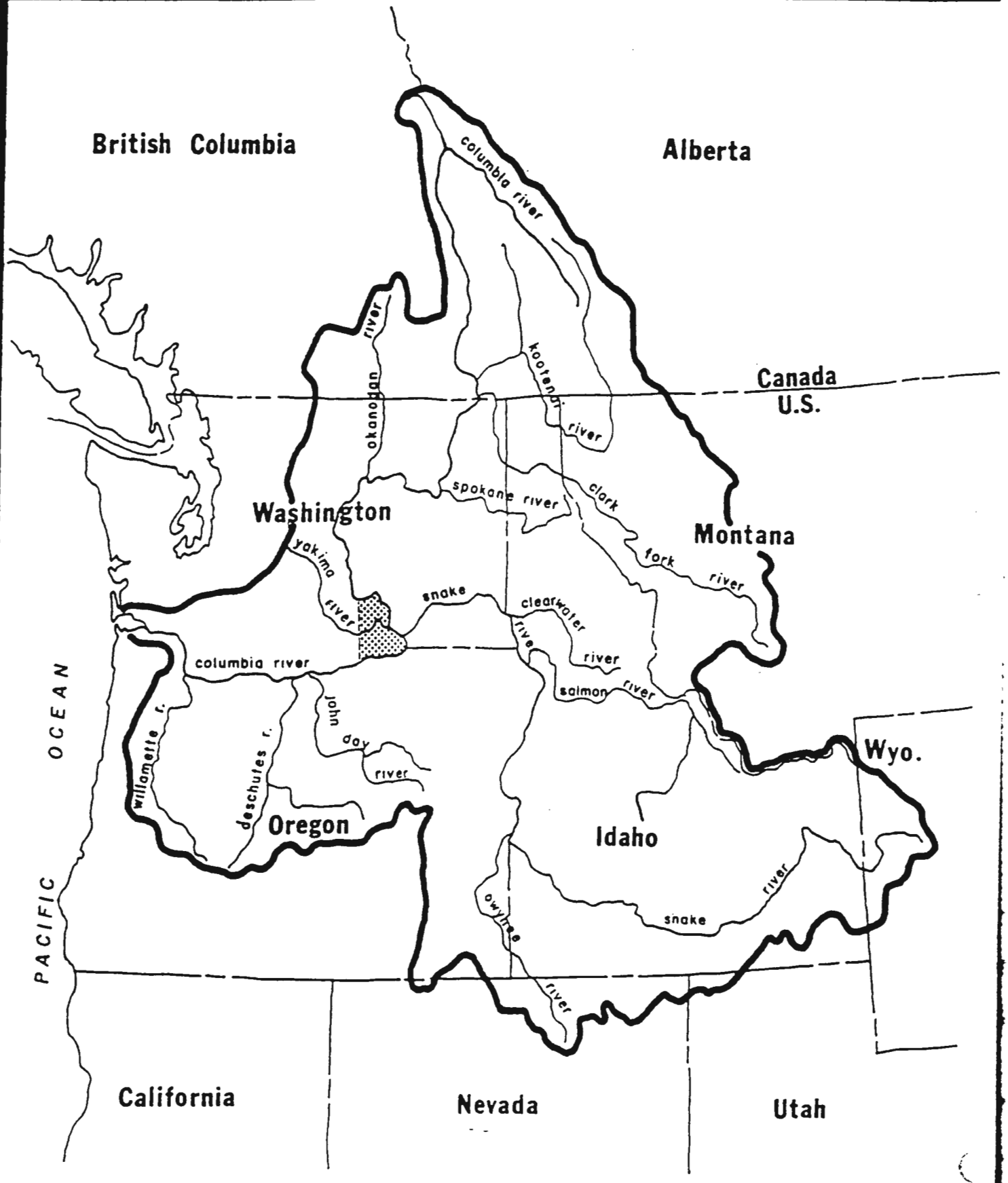
Definition and Purpose:
Areas primarily used to provide land suitable and desirable for those retail commercial activities serving local neighborhood trade areas. Since the primary purpose of this classification is to provide convenience shopping to residents living nearby, development within such areas should be designed to blend into the character of the local neighborhood and not be incompatible with residential living.

As both urban and rural residential areas develop and expand, the need is generated for retail establishments to be located within a few minutes driving or walking distance to supply day-to-day necessities and convenience goods and services demanded by neighborhood residents. In protecting local character and neighborhood livability, it is important to exclude those types of activities which have the potential of becoming generators of community and regional traffic.

It is important that the size of the neighborhood commercial designations be kept to a minimum. In rural areas, the designations should encompass only lands immediately adjacent to arterial intersections. Within urban growth boundaries, standards set by the respective cities should be used as the guide when determining the extent of such designations.

Benton County Comprehensive Plan

Columbia River Drainage Basin



MAP 14

TABLE 11: USES TO BE SUPPORTED ACCORDING TO WATERCOURSE CLASSIFICATION

USE	WATERCOURSE CLASSIFICATION			
	AA	A	B	C
Fisheries				
Salmonoid				
Migration	X	X	X	X
Rearing	X	X	X	
Spawning	X	X		
Warmwater Game Fish				
Rearing	X	X	X	
Spawning	X	X	X	
Other Food Fish	X	X	X	
Commercial Fishing	X	X	X	
Wildlife	X	X	X	
Recreation				
Water Contact	X	X		
Boating and Fishing	X	X	X	X
Environmental Aesthetics	X	X	X	X
Water Supply				
Domestic	X	X		
Industrial	X	X	X	X
Agricultural	X	X	X	X
Navigation	X	X	X	X
Log Storage and Rafting	X	X	X	X
Hydropower	X	X	X	X

Source: State of Washington, Water Quality Assessment Report 1980; Department of Ecology

According to the U.S. Army Corps of Engineers, mixing is lowest during the low-flow conditions (August to mid-November). In summer, the surface layer has higher temperatures, but lower waters are relatively well mixed.

> In general, the water in this stretch of the Columbia River is considered to be of good quality regarding dissolved oxygen, color, turbidity, hardness, dissolved solids, and chemical oxygen demand (COD). The major problems are elevated summer temperatures, high nutrient levels, and nitrogen supersaturation. High temperatures are an important limiting factor in adult fish migrations. Temperatures measured between 1977 and 1979 range from 32 degrees F (January to February) to 72.5 degrees F (August). These waters are designated as Class A (Excellent) by the Washington State Department of Ecology (WAC 173-201-080)."

It should also be noted that in the 1979 EPA Washington Environmental Quality Profile the lower Columbia River between Portland and the Tri-Cities was rated as being intermittently or moderately polluted and considered marginal with respect to meeting the goals of the Federal Water Pollution Control Act.

Yakima River

The Yakima River Drainage Basin is actually a sub-basin of the Columbia River system. With its headwaters in the Cascade Mountains, the Yakima flows in a southeasterly direction draining most of Kittitas and Yakima Counties as well as that part of Benton County located between the Horse Heaven and Rattlesnake Hills. (See Map 15). The development of the Yakima Irrigation Project by the U.S. Bureau of Reclamation has by and large made possible the tremendous agricultural production of the fertile Yakima Valley which extends into Benton County. This development has also resulted in the Yakima becoming one of the most polluted rivers in the State.

A Status Report of Water Quality Investigations, Yakima River Basin, Washington was prepared for the U.S. Bureau of Reclamation in 1977. That document summarizes the extent of pollution in the Yakima River. The central findings were summarized as follows:

"The water quality of the lower Yakima Basin suffers from the impact of man's activity thar probably any other basin in the State. As the Yakima River flows toward the Columbia, almost all of its water quality parameters deteriorate. The classic "fishability" and "swimmability" uses are at a minimum especially in the lower reaches of the river. The main reason for this water quality deterioration is the incredibly intensive use and reuse of the river water for the various needs of the agricultural industry.

Flows fluctuate radically as water is diverted from the river or reenters as return flows. Minimum low flows, particularly below Sunnyside Dam, approach zero during exceptionally dry years. When this cordition exists, virtually the entire river is made up of irrigation and other type return flows.

Water quality in the headwaters of the Yakima river is excellent. However, as soon as the first major irrigation return flows enter the river from the Kittitas Valley at Wilson Creek, the quality is affected. Further degradation occurs from the Ahtanum and Moxee Valleys, but primarily because of the addition of municipal and industrial wastewaters. Even so, the quality of the Yakima River as it passes through Union Gap is fairly good, and few beneficial uses are impaired.

Between the Sunnyside Dam and Mabton, a distance of about 45 miles, the summer flows are significantly reduced by diversion, the gradient flattens and water temperatures rise, and nutrient- and sediment-rich return flows are added to produce river water that cannot meet even the lowest Washington quality standards. The river is unfit for most water activities from a health and aesthetic standpoint."

Ground Water

In 1978 the Benton County Planning Department had a geologic and hydrologic study of the County conducted. The following excerpts from the findings of that study describe the County's ground water resource:

Ground waters occur in south-central Washington in both unconfined or water table aquifers (generally at shallow depth and as confined and locally artesian, generally deep aquifers. The unconfined aquifers are restricted to the Pasco Gravels and Touchet Silts, and to the Ringold Formation sediments. The confined aquifers lie dominantly in the basalt sequence, where they commonly are the tabular zones between basalt flows.

The water table aquifers are recharged by precipitation and runoff, but also from leaking irrigation canals and wasteways, and from irrigated farmland and other sources. The waters move generally toward and into the respective rivers that form the base level for the water table.

The confined aquifers are evidently recharged dominantly in the higher lands surrounding the basin. There precipitation and snow melt runoff flowing down canyons enters the upturned and eroded edges of the aquifers to move toward and ultimately into the Columbia and other rivers.

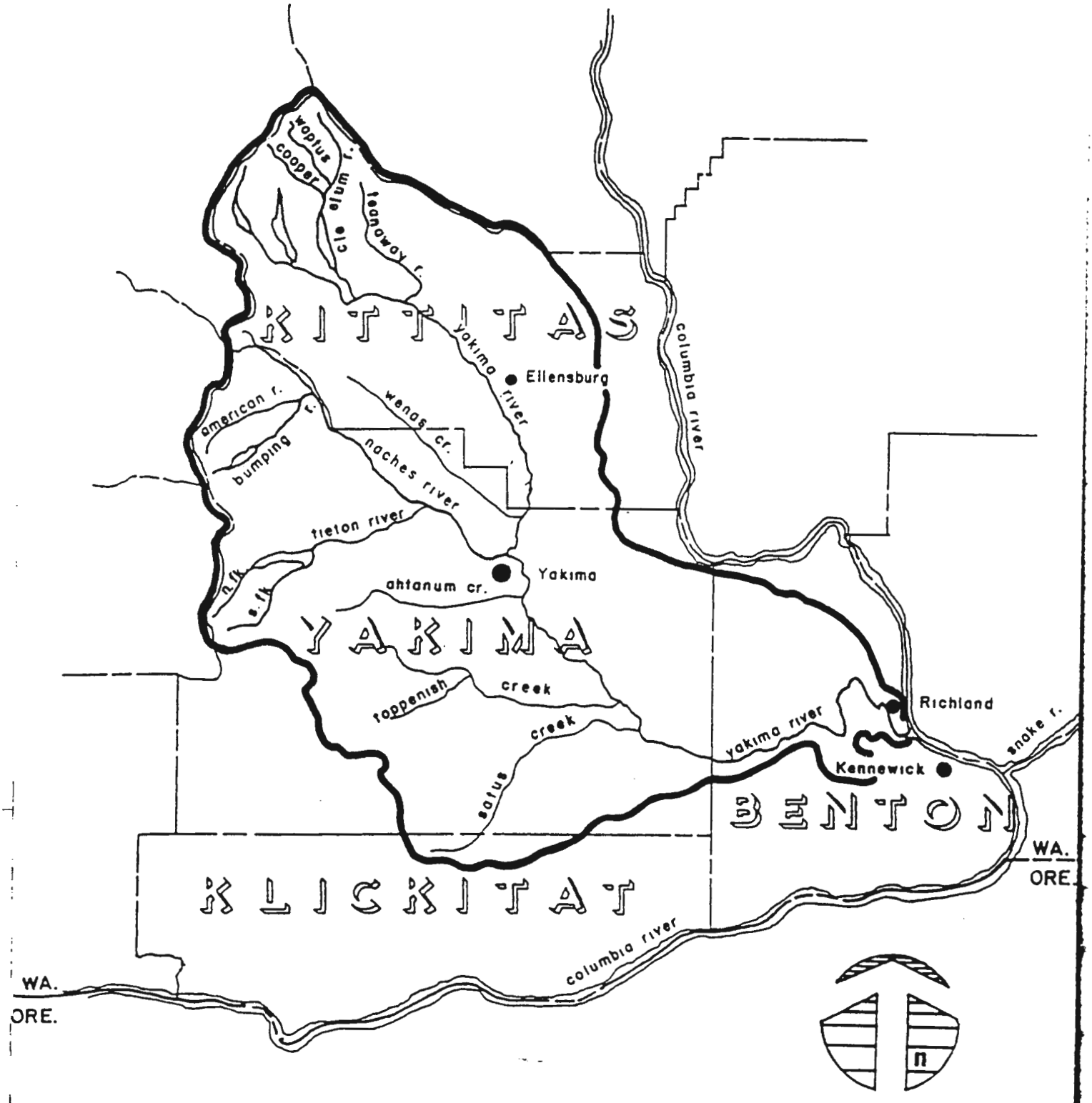
The general direction of flow of the ground waters, in both kinds of aquifers, can be estimated although complex patterns of flow oftentimes occur where several sources recharge an aquifer.

The amounts of water flowing in the aquifers, and hence the amount available for use, depends upon the recharge. In years such as that of 1976-77, recharge was low. Should several successive years of low recharge occur, water levels may fall appreciable. Elsewhere, where numerous irrigation wells have been drilled, both the confined and unconfined aquifers have been strained, with a resulting lowering of water levels. In other instances, wells have been sited too close together, with resulting interference between them.

The unconfined or water table aquifers are subject to recharge from local sources such as irrigation runoff, wastewater, and consequently are less likely to be depleted, than some of the confined aquifers. However, local recharge may and locally has resulted in contamination and local pollution of some of the unconfined ground waters. In some locales the abundance of recharge has created perched water bodies, or water tables so high that wet land develops. In other locales the water has resulted in an instability of the land, with resulting landslides. Even where the land remains stable problems may deny use of the land.

Benton County Comprehensive Plan

Yakima River Drainage Basin



MAP 15

More specific information regarding ground water quality is available for two areas: the Yakima Basin and a special study area in the vicinity of Finley. The Yakima Basin findings were summarized in the State Department of Ecology's Characterization of Present Water Quality Conditions in the Yakima Basin prepared in 1975:

> "Though very little data on ground water quality in the Yakima Basin exists, the available data indicates that the quality is of a good quality in the deeper aquifers and poorer in the shallow aquifers. Undoubtedly, the shallow aquifers are affected more by salts and minerals leached downward through the soils by irrigation.
>
> The quality of ground waters are suitable for most uses and only a few isolated cases of wells with high nitrate or hydrogen sulfide have been reported. The shallow ground water aquifers in several areas of the basin have experienced outbreaks of typhoid. It is felt that septic tanks were responsible for most of these occurrences."

The Finley area study was conducted in 1977. Benton County contracted with the Engineering School of Walla Walla College to study ground water quality in that area. The study area consisted of 12 square miles which did not have a community water or sewer system and which utilized individual wells for water supply and septic tank and drainfield systems for domestic waste disposal. The study surveyed 100 wells to establish the existing quality of ground water with respect to a limited number of bacteriological and chemical parameters which are commonly used as indicators of water quality. Tests were run for coliform organisms, specific conductivity, total dissolved solids, nitrates and chlorides. The results of the study found that the ground water was quite highly mineralized in some portions of the study area and that the levels of nitrate and chlorides were within acceptable limits for use as drinking water, but that the water in twenty-two of the wells, nearly 25 percent, had coliform levels which exceeded the maximum permitted limit for public drinking water supplies.

VEGETATION AND WILDLIFE

The County's vegetation and wildlife resources are thoroughly examined in the EIS prepared for this Comprehensive Plan and will only be briefly summarized here.

Benton County is entirely within a large, contiguous zone of shrubsteepe vegetation characterized by an association of big sagebrush-bluebunch wheatgrass plant communities. The dominant shrubs are big sagebrush and bitterbrush and dominant grasses are species of wheatgrass and fescue.

Areas of special interest in regard to vegetation and wildlife in the County are found in many places along the Columbia and Yakima Rivers. Many of these riparian areas support an extensive and diverse ecosystem with rich plant and animal communities. Examples include the Yakima River Delta with its native cottonwood stands and some of the Columbia River islands that provide nesting sanctuary for Canada geese, mallard ducks, and other waterfowl. During the winter, the Columbia River in this area serves as a prime resting place for migratory ducks and geese.

As noted by the Washington State Department of Game in their review of the Draft EIS for this Comprehensive Plan, "songbirds found in riparian areas include eastern kingbird, black-billed magpie, northern oriole, and song sparrow. Bewick's wren is found in eastern Washington only along the bottoms of the Yakima River. The most important game birds in riparian vegetation are ring-necked phesant, California quail, and mourning dove. Raptors will use riparian trees for nesting. Mule deer feed along river shorelines and on islands during summer. Other mammals that use riparian areas include the deer mouse, western harvest mouse, raccoon, beaver and muskrat. Common amphibians are Woodhouse's toad and Great Basin spadefoot toad."

The importance of these riparian areas far outweighs their proportion of the County's total habitat area, and as such their conservation whenever feasible would be a sound investment in the future quality of life to be found in the County. As an indication of the relative importance of these riparian areas, it can be noted that almost all of the wildlife management areas found in the Benton County area are located along the two rivers (See Map 16).

The importance of riparian or shoreline areas was recognized by the State of Washington with the passage of the Shorelines Management Act of 1971 (R.C.W. 90.58). This Act found that "the shorelines of the state are among the most valuable and fragile of its natural resources". The Act provided for the development of "master programs for shorelines of statewide significance" by local governments with such shoreline areas.

In Benton County, the provisions of the Act are implemented through the County's Shoreline Management Master Plan which applies to lands within 200 feet of the shoreline of the Columbia and Yakima Rivers and Glade Creek up to its junction with the East Branch of that Creek (See Map 17).

The County's shorelines have been divided into the designations which are defined below and delineated on Map 17.

1. Urban Environment

Purpose - The purpose of assigning an area to an Urban Environment is to ensure optimum utilization of shorelines occurring within urbanized areas by providing for intensive public use and by managing development so that it enhances and maintains shorelines for a multiplicity of urban uses.

Definition - The Urban Environment is an area of high intensity land use including residential, commercial, recreational and industrial development. It is particularly suitable to those areas presently subject to extremely intensive use pressure, as well as areas planned to accommodate urban expansion. Shorelines planned for future urban expansion should present few bio-physical limitation for urban activities and not have a high priority for designations as an alternative environment.

2. Rural Environment

Purpose - The purpose of assigning an area to a Rural Environment is to protect agricultural land from urban expansion, restrict intensive development along undeveloped shorelines, function as a buffer between urban areas, and maintain open spaces and opportunities for recreational uses compatible with agricultural activities.

Definition - The Rural Environment is intended for those areas characterized by intensive agricultural and outdoor recreational uses and those areas having a high capability to support active agricultural practices and intensive outdoor recreational development. Hence, those areas that are already used for agricultural purposes, or which have agricultural potential should be maintained for present and future agricultural needs. Designation of rural environments should also seek to alleviate pressures of urban expansion on prime farming areas.

3. Conservancy Environment

Purpose - The purpose of assigning an area to a Conservancy Environment is to protect, conserve and manage existing natural resource and valuable historic and cultural areas in order to ensure a continuous flow of recreational benefits to the public and to achieve sustained resource utilization.

Definition - The Conservancy Environment is for those areas which are intended to maintain their existing character. The preferred uses are those which are nonconsumptive of the physical and biological resources of the area. Nonconsumptive uses are those uses which can utilize resources on a sustained basis while minimally reducing opportunities for other future uses of the resources in the area. Activities and uses of a non-permanent nature which do not substantially degrade the existing character of an area are appropriate uses for a Conservancy Environment. Examples of uses that might be predominant in a conservancy environment include diffuse outdoor recreation activities, passive agricultural uses such as pasture and range lands, and other related uses and activities.

4. Natural Environment (no designation in Benton County)

Purpose - the purpose of assigning an area as Natural Environment is to preserve and restore those natural resource systems existing relatively free of human influence. Local policies to achieve this objective should aim to regulate all potential developments degrading or changing the natural characteristics which make these areas unique and valuable.

Definition - The primary determinant for designating an area as a Natural Environment is the actual presence of some unique natural or cultural features considered valuable in their natural or original condition which are relatively intolerant of intensive human use. Such features should be defined, identified and quantified in the shoreline inventory. The relative value of the resources is to be based on local citizen opinion and the needs and desires of other people in the rest of the state.

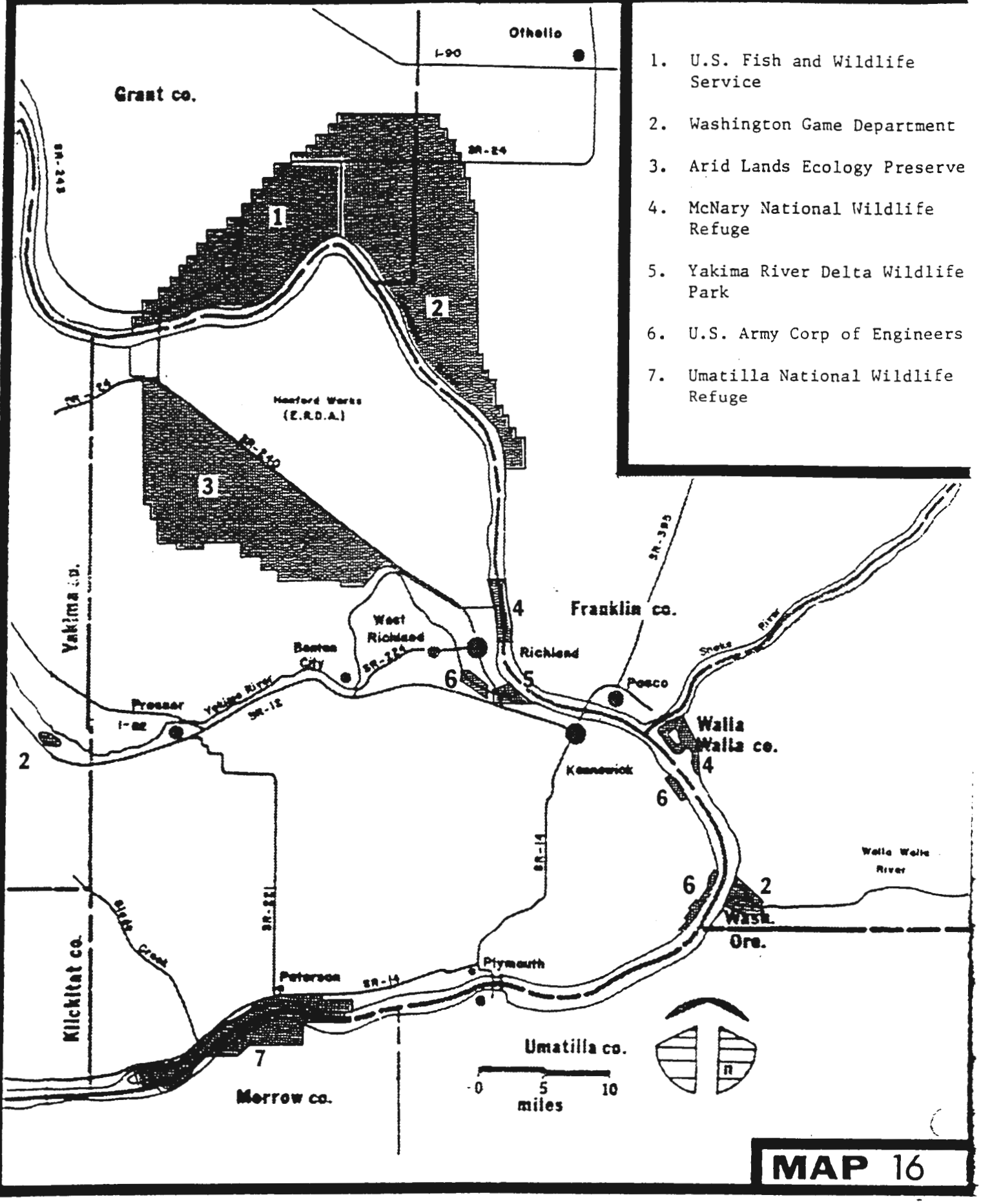
These designations and the guidelines associated with them are part of a review process that is applied to development proposals in any of the designated areas. The process is designed to ensure that the wise use of the County's shorelines is promoted in light of their recognized significance.

Fish

Columbia River

Benton County Comprehensive Plan

Fish and Wildlife Management Areas

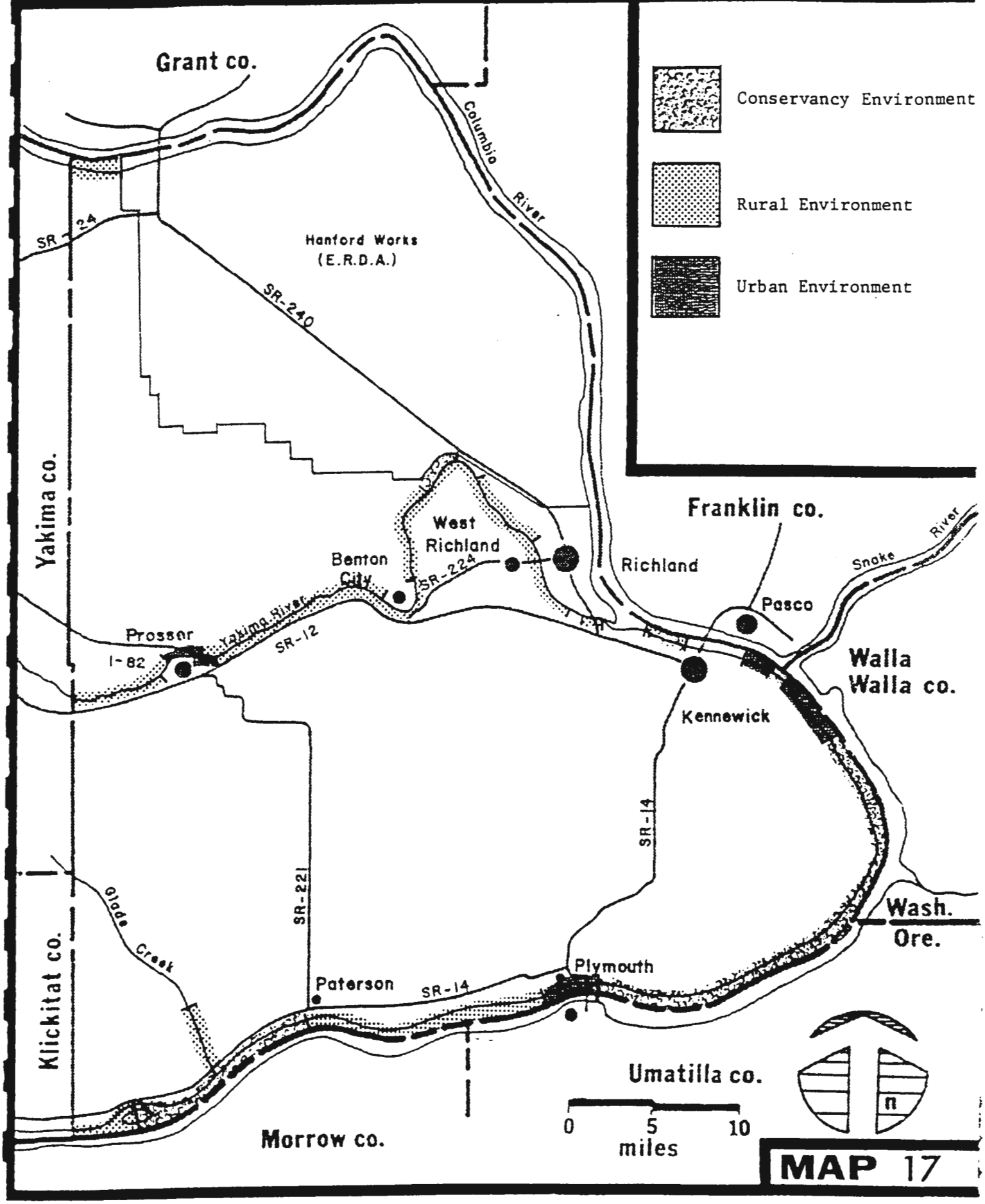


1. U.S. Fish and Wildlife Service
2. Washington Game Department
3. Arid Lands Ecology Preserve
4. McNary National Wildlife Refuge
5. Yakima River Delta Wildlife Park
6. U.S. Army Corp of Engineers
7. Umatilla National Wildlife Refuge

MAP 16

Benton County Comprehensive Plan

Shorelines Management Plan



MAP 17

"The salmon and steelhead runs of the Columbia River system were the greatest of any river on Earth. Uncounted millions of fish ran annually from the North Pacific, swam up the river, its tributaries, and every stream and creek in the giant areas from the Canadian Rockies to Wyoming, Idaho, Oregon, and Washington. The Columbia boiled with millions of salmon struggling upstream from May to October, each race fighting to return to spawn and die in the stream of its birth."[1]

The above description regrettably no longer applies to the Columbia River system. However, the Columbia is still in all likelihood the primary salmon-producing stream in the United States. As the river flows along Benton County's borders it is important as a transportation route and spawning ground in regard to the anadromous fish population. The salmonoid species that are to be found in the Snake, Clearwater, and Salmon rivers in Idaho; the Grande Ronde in Oregon; and as far north as the Okanogan River in Washington must pass through the Columbia River in Benton County at least twice - once as juveniles on their way downstream to the Pacific Ocean, and again as adults on their way back upstream to their spawning grounds. The important species in this regard are chinook, coho, and sockeye salmon; and steelhead trout. Table 12 gives the counts for these species passing McNary Dam for the years 1970-1978.

Factors that have been identified as contributing to the decline in numbers of anadromous fish have been dams, nitrogen supersaturation, dredging, channelization, agricultural chemicals, loss of spawning habitat, and the impact of commercial and sport fisheries.

TABLE 12: NUMBER OF ADULT SALMONOIDS PASSING McNARY DAM 1970-1978

YEAR	CHINOOK	STEELHEAD	SOCKEYE	COHO	TOTAL
1970	168,892	69,759	59,636	36,399	334,686
1971	171,448	109,630	52,867	39,358	373,303
1972	168,821	93,820	26,422	45,635	334,698
1973	184,112	64,620	42,731	17,682	309,145
1974	127,858	26,932	26,505	13,746	195,041
1975	133,150	22,663	43,143	3,975	202,931
1976	163,314	54,000	24,632	7,539	249,485
1977	183,581	87,712	80,781	4,622	356,696
1978	144,044	34,663	18,511	20,272	217,490

Source: U.S. Army Corps of Engineers. Annual Fish Passage Report, Columbia River Project and Snake River Projects. 1979.

The free-flowing section of the Columbia River between Priest Rapids Dam and the City of Richland is the last remaining free-flowing segment of the Columbia in the United States. As such it is the last remaining natural spawning area on the main stem of the Columbia for these salmonoids and supports the largest population of fall chinook in the Columbia Basin.

The Columbia River in the Benton County area also supports many resident fish species including such important game fish as rainbow trout, largemouth bass, smallmouth bass, walleye and sturgeon, which in some cases is considered to be anadromous.

Yakima River

About 600,000 salmon and steelhead migrated in the Yakima River system annually prior to 1880. Anadromous fish now in the Yakima River system have decreased to approximately 10,000. This decline has principally been the result of declining upstream fish movement in the Columbia River coupled with the construction of irrigation storage dams and low water flows in the Yakima River. Anadromous species of fish presently utilizing the Yakima system include spring and fall chinook salmon, coho salmon and steelhead trout. In 1975, the National Marine Fisheries Service estimated that 3,000 spring chinook, 1,000 fall chinook, 1,000 coho salmon and 6,000 steelhead trout entered the Yakima River. Resident fish inhabiting the Yakima system include bass, crappie, dace, carp, squawfish, trout and catfish.

[1] John L. Wright, Marvin B. Dunning, and Jon H. Decker, Stewards of the River (The Columbia River and Tributaries Study) Page 29.

TABLE 13: ACOUSTIC POWER OF VARIOUS SOURCES

POWER (WATTS)	DECIBELS	SOURCE	EFFECT
100,000.0	170	Turbo-Jet Engine with Afterburner	
10,000.0	160	Turbo-Jet Engine	
1,000.0	150	Propeller Airliner	
100.0	140	Air Raid Siren 75-Piece Orchestra	Painfully Loud
10.0	130	Small Aircraft Engine	
1.0	120	Piano, Discotheque Thunder	Peak Vocal Effort
0.1	110	Blaring Radio Pile Drivers	
0.01	100	Chain Saw	
0.001	90	Heavy Truck Voice Shouting	Very Annoying, Hearing Damage
0.000,1	80	Hair Dryer	
0.000,01	70	Freeway Traffic Voice-Conversation Level	Phone Conversation Difficult
0.000,001	60	Air Conditioning	
0.000,000,1	50	Light Auto Traffic	Quiet
0.000,000,01	40	Quiet Office	
0.000,000,001	30	Voice-Very Soft Whisper	Very Quiet

Source: Center for Urban Policy Research, 1979, A Primer on Industrial Environmental Impact, Piscataway, New Jersey

NOISE

Effects

Noise (unwanted sound) has increasingly been recognized as a potentially dangerous environmental factor. Documentation of physiological effects such as hearing damage and high blood pressure has lead the medical community especially to recognize the harm that can result from excessive noise. Table 13 indicates some of the impacts that varying levels of noise can have.

Sources

Noise sources can be divided into four general categories: (1) transportation, (2) commercial and industrial, (3) recreational, and (4) residential. The following is a brief description of each category:

Transportation noise emanates from a variety of modes, including roadway vehicles, aircraft, trains, and boats. It consists of varied sounds from horns, engines, tire squeals, sirens, etc. commercial and industrial noise includes such varied sources as refrigeration systems, quarry blasting, rock crushers, large industrial complexes, steam release blasts, vent fans and blowers, etc. Recreational noise sources include ballfields, swimming pools, power boats and offroad vehicles. Residential noise sources include barking dogs, power mowers, air conditioning, radios and stereos. It should be noted that often the single most frequent complaint to community police departments is barking dogs.

LONG RANGE NEEDS

Air and Water Quality

For the most part, monitoring and control of air and water pollution sources in the Benton County area comes under the purview of three agencies - the U.S. Environmental Protection Agency, the Washington Department of Ecology, and the Tri-County Air Pollution Control Authority. As a result, the County has a somewhat limited role to play in regard to air and water quality. For the most part, the most effective role available to the County in this regard is through continued implementation of the Environmental Impact Statement and Shorelines Management processes for projects prepared for the Benton County area, as well as through active cooperation with the above mentioned agencies.

Vegetation and Wildlife

In most of Benton County, the natural vegetation and wildlife habitat has been converted to urban, rural residential, or agricultural uses. There are some areas however, that have remained in a relatively natural state, and of these some of the most valuable are to be found along the Columbia and Yakima Rivers. As Benton County continues to grow and develop, these riparian areas that support a rich and varied vegetation and wildlife population will become an increasingly valuable and scarce resource of the County.

The County's Shoreline Management Program provides the County with a direct means of dealing with this issue and should continue to be utilized to guide such development as is to occur in the shoreline areas to those locations that are most appropriate for development while protecting the most valuable natural riparian areas.

The environmental impact statement (EIS) process should also be utilized to its fullest potential for development proposals along the riparian areas so that resulting impacts can be fully analyzed and planned for. Finally, it should be noted that almost all of the immediate shoreline of the Columbia River in Benton County is Federal land, coming under the jurisdiction of either the U.S. Army Corps of Engineers from the Klickitat County line, upstream to the northern city limits of City of Richland; or the Department of Energy from that point upstream to a point approximately 20 miles east of the Yakima County line. The County should work closely with these agencies to ensure that Benton County's interests in the wise conservation and development of these areas are fully represented.

Noise

As the County grows and develops over the long-range planning period, the potential for noise conflicts between adjacent or nearby uses will increase. In recognition of the fact that some land uses are noise sources and other are noise sensitive, the consideration of noise conflicts should be included as a factor in the County's land use planning process. To a certain extent, this is already taken care of through the EIS process and as such, this element of the planning process should be fully utilized.

In those cases where adverse noise impacts can be expected, various mitigating techniques can be utilized. These would include such techniques as acoustical soundproofing, landscaping techniques such as berms, and height restrictions. The County's efforts in this regard should be coordinated with state and federal statutes, programs, and policies dealing with noise.

CONCLUSION

The quality of the elements of the environment examined in this element of the Comprehensive Plan are a determining factor in the quality of life to be found in Benton County. In some areas, such as air and water quality, the State and Federal governments have assumed the lead role in maintaining environmental quality. However, the County also has a determining role to play, and local land use decisions are especially significant in regard to the extent to which the County's natural environment will be impacted as the the County continues to develop over the long-range planning period.

In many cases development can occur with little or no significant conflict between the intended use and the County's natural environmental attributes. In other cases, tradeoffs will have to be made between protecting the environment and proceeding with development that will have significant adverse impacts upon that environment. The resolution of these issues will have a direct bearing upon the quality of life to be found in Benton County by present and future generations, and in light of this, these concerns have been utilized as one of the determining factors that led to the goals, policies, recommendations, and maps that constitute the important guidelines of this Comprehensive Plan.

CHAPTER VI

PARKS, RECREATION, OPEN SPACE, AND HISTORIC PRESERVATION ELEMENT

PARKS, RECREATION, OPEN SPACE AND HISTORIC PRESERVATION ELEMENT

INTRODUCTION

Over time a community's or region's "parklands" have proven to be one of the most valuable investments that can be made. These lands provide a place for people to focus and display pride in their community while helping to satisfy their basic social and recreational needs as well. The open space that parklands provide helps to soften the "developed" world we live in and allows people the opportunity to come in touch with the natural environment around them and to increase their awareness of the integral part they play in that environment. Historic preservation is important because it adds to an area's livability by providing a unique perspective on that area's past.

Parklands should be planned to provide a variety of recreational opportunities to help meet the needs of people of all ages. Relevant locations, demand for differing recreational activities, and "greenway" circulation patterns connecting the parks system are major considerations in acquiring, developing, and maintaining park, recreation and open space lands. "The measure of any great civilization" according to John Ruskin, "is its cities; and a measure of a city's greatness is to be found in the quality of its public spaces, its parks, and its squares." In many respects, "county" can be substituted for "city" in the above quotation.

The Parks, Recreation, Open Space, and Historic Preservation Element of this Comprehensive Plan is not meant to supersede the County Comprehensive Parks and Recreation Plan-1982. Rather, it is intended to ensure that the parks, recreation, and open space needs of the citizens of Benton County are incorporated into the County's planning process.

CONCLUSION

Presently the county has adopted the Benton County Comprehensive Parks and Recreation Plan - December 1982, which give more information on Parks, Recreation, Open Space and Historic Preservation in Benton County. For a more in depth study of this element please refer to that document.

CHAPTER VII

PUBLIC FACILITIES AND SERVICES ELEMENT

PUBLIC FACILITIES AND SERVICES ELEMENT

INTRODUCTION

The provision of local level public facilities and services is the frontline activity for those jurisdictions responsible for them. Once people become accustomed to basic facilities and services such as water, sewer, police, and fire protection, they expect them to be provided without interruption. When this is not the case, all other endeavors of the local government shrink to insignificance in the public eye.

The cost of providing these facilities and services has been escalating at an alarming rate while at the same time people across the nation are increasingly sensitive to any increase in property or other taxes. Providing long-range solutions to these service delivery problems will probably be one of the most difficult tasks to be faced by the County and other local service providers over the long-range planning period. This element of the Comprehensive Plan; along with the related goals, policies, recommendations and maps; is designed to help set a course for solving these problems.

This is not an engineering report. Facilities planning and design are the responsibility of the engineers. Much of the background for this element has been synthesized from the draft and final environmental impact statements for this comprehensive Plan. For more detailed analysis of these topics, the reader is referred to those documents.

BACKGROUND

Water Supply Systems

According to the Washington Department of Social and Health Services (DSHS) there are currently (April, 1980) 110 public and private water supply systems located in Benton County providing domestic water. DSHS keeps a water facilities inventory of water systems in the County that includes classification of systems according to type of system and number of customers served. The criteria used in establishing these classifications are described in Table 14. It should be added that DSHS defines a community water system as a public water system that serves a permanent or seasonal population (subdivisions, mobile home parks, etc.), and a non-community water system as a public water system that serves a transitory population (restaurant, motel, etc.).

According to DSHS figures, as of April, 1980, there were 8 class 1, 38 class 2, 33 class 3, and 31 class 4 water systems located in Benton County. Source of water supply is ground water for all these systems with the exception of the Cities of Kennewick and Richland, which in addition to ground water, receive water from the Columbia River. Information regarding the populations served and the average daily amount of water used by each water system class in the County is presented in Table 15.

TABLE 14: WATER SYSTEM CLASSIFICATIONS
(DSHS Criteria)

CLASS	CRITERIA
1	Community system with 100+ customers (connects)
2	Community system with 10-99 customers
3	Non-Community system with 25+ people served
4	Community system with 2-10 customers
4	Non-Community system with 1-24 persons served

Source: Washington Department of Social and Health Services

As is shown in Table 15, approximately 86,000 people in Benton County are served by some type of public or private water system. Average daily use is nearly 27 million gallons, representing an average daily per capita use of approximately 312 gallons. Assuming that the balance of the County's population not served by water systems are using individual private wells for their domestic water supplies, and assuming that the per capita consumptive use of water from such wells is the same as that of water systems, the total amount of water consumed from water systems and domestic wells in Benton County can be determined as follows:

TABLE 15: PUBLIC AND PRIVATE WATER SYSTEM SERVICE AND CONSUMPTIVE USE

CLASS	PERMANENT POPULATION SERVED	AVERAGE DAILY USE (GALLONS)	AVERAGE DAILY PER CAPITA USE (GALS.)
1	81,421	25,797,500	316.8
2	2,397	703,205	293.4
3	2,255	391,985	173.8
4	198	35,375	178.7
TOTAL	86,271	26,928,065	312.1

Source: Washington Department of Social and Health Services and Cities of Benton City, Kennewick, Prosser, Richland and West Richland, April 1980 with update October 1980.

1. Population in individual wells = 1980 population - population served by water systems (109,444 - 86,271 = 23,173 people.)

2. Consumptive use of individual wells = Population served by individual wells x per capita water use (23,173 x 312 = 7,229,976 gallons per day.)

3. Total Benton County domestic water use* = Consumptive use of water systems + consumptive use of individual wells (26,928,065 + 7,229,976 = 34,158,041 gallons per day.

*Includes some commercial and industrial use.

As estimated, over 34 million gallons of water is supplied from water systems and individual wells, exclusive of irrigation wells and systems. The five incorporated cities in the County and the unincorporated community of Plymouth each have municipal water systems, serving a combined total population of approximately 82,000 people, or approximately 75 percent of the total County population. As shown on Table 16, total consumptive use of these municipal systems is nearly 26,000,000 gallons per day or approximately 76 percent of the County's estimated total average daily consumption.

A more inclusive description of all systems in Benton County serving 25 or more customers is presented in Table 17 which is based upon data on file with the State Department of Social and Health Services and with the respective cities in the County.

Map 18, portrays the general locations of municipal water and sewer service area boundaries in Benton County. The major purpose of service area boundaries is to enable the service provider to plan for the timely, orderly, and efficient provision of the water or sewer system. The delineation of a service area boundary establishes an area in which a utility provider can safely plan for the development and improvement of a utility system with a certain amount of security that investment in such developments and improvements will not be jeopardized by another provider intruding into the service area.

TABLE 16: MUNICIPAL WATER SYSTEMS

SYSTEM	POPULATION SERVED	AVER. DAILY USE (GALLONS)	AVER. DAILY PER CAPITA USE (GALS.)
Benton City	2,043	227,000	111.1
Kennewick	38,000	8,500,000	223.7
Plymouth	190	8,000	42.1
Prosser	3,927	1,910,000	486.8
Richland	34,251	14,520,500	423.9
W. Richland	3,200	640,000	200.0
TOTAL	81,611	25,805,500	247.9

Source: Washington Department of Social and Health Services and Cities of Benton City, Kennewick, Prosser, Richland and West Richland, April, 1980.

The water and sewer service area boundaries for Kennewick, Richland, and West Richland were taken from the "Water and Sewer Service Area Boundaries, 1980" maps prepared by the Benton-Franklin Governmental Conference in November, 1980. The Benton City water service area boundary was extracted from the Comprehensive Water Plan prepared for the City by Vitro Engineering in 1977, and the Plymouth water system service area boundary was taken from the Water Supply Plan prepared for the Plymouth Water District by Columbia Engineers in 1977. According to City officials and the City's consulting engineers, the City of Prosser to date has not adopted an official service area boundary for either its water or sewer system.

The County's five incorporated cities have some variation in policy regarding the provision of sewer and/or water utilities to areas outside the city limits. The City of Prosser for the most part will provide sewer and water only to areas that have been annexed but has provided these utilities to a few located outside of the city limits with the requirements that the rate charge will be 150 percent of the rate for areas within the city limits. Benton City has been extending sewer and water outside of the city limits with a similar rate arrangement but is considering changing its policy to requiring annexation as a condition to the extension of their facilities. The City of West Richland has for the most part required annexation as a condition. The Cities of Richland and Kennewick has been requiring either annexation or the signing of an annexation agreement as a condition for the provision of sewer and water facilities.

Sewer Facilities

As shown by Table 18, wastewater collection and treatment systems are provided by all five of Benton County's incorporated cities as well as two manufactured (mobile) home parks - Hills and Poplar Heights. For the most part, residents not served by community systems rely on individual septic tank and drainfield systems.

As shown on Table 18, two municipal systems, Benton City and West Richland are operating at or above design capacity. The City of Prosser, although operating below capacity, currently is not meeting State water quality criteria for the effluent discharged into the Yakima River from their treatment plant. The City of Prosser anticipates improvements by 1983 which will bring their system into compliance with the criteria. Both Benton City and West Richland also anticipate making improvement to their treatment systems. The Benton City system is currently operating at approximately 133 percent capacity, resulting in overflows of untreated sewage into the Yakima River.

Although the City of Richland could accommodate an estimated additional 5,749 population, improvements are planned for 1987 which would bring the City's treatment system capacity up to 68,500 population. Other than adding to its collection system, the City of Kennewick currently has no plans for improvements which would increase capacity. Current design capacity of Kennewick's treatment system could handle an additional 60,000 population. The City of Kennewick according to 1980 figures has considerable excess capacity in its treatment system. It is estimated that Prosser's existing system could accommodate some 200 additional users.

Total design capacity for all systems, including the two manufactured (mobile) home parks, is shown by Table 18 to be 141,668 people or approximately 32,000 over the County's 1980 population (109,444). Approximately 75,000 people are currently being served by sewer utility systems, representing 69 percent of the County's population and 53 percent of all systems' capacities. Based upon these figures, it can be estimated that approximately 34,000 County residents rely on on-site treatment systems, i.e., septic tanks, for sewage disposal.

The figures in Table 19 indicate that per capita average daily flow for all systems in the County is 140 gallons per day. This figure includes the industrial waste treated by the Richland and Kennewick systems which amounts to approximately 1,737,000 gallons of industrial waste per day. Excluding these industrial waste flows, per capita average daily flow for all systems in the County is approximately 117 gallons per day.

TABLE 19: PER CAPITA FLOWS OF WASTEWATER SYSTEMS

NAME OF SYSTEM	PER CAPITA FLOWS AVERAGE DAILY GALS./DAY	PER CAPITA FLOWS AVERAGE ANNUAL GALS./YEAR
City of Benton City	86.7*	31,646
City of Kennewick	154.4	56,356
City of Prosser	105.2**	38,398
City of Richland	139.8	51,027
City of West Richland	100.0	36,500
Hills Mobile Home Park	88.9	32,449
Poplar Heights Mobile Home Park	38.5	14,053
ALL SYSTEMS	139.9	51,064

* Since the Benton City system is operating above capacity and bypasses the overflow to the Yakima River, per capita flows were derived by dividing population capacity (rather than current population) into total average daily flow.

**Prosser has two sewer treatment plants: One treats municipal sewage, while the other treats industrial sewage. Per capita figures shown are for the municipal treatment plant only.

Source: Correspondence with respective systems management, May, 1980.

Storm Water Drainage

The cities of Kennewick, Prosser, Richland and West Richland provide storm drain collection systems for surface water, street wash and other drainage. All these systems eventually drain into the Yakima or Columbia Rivers. In Kennewick, only the downtown area is storm sewered with drywells and catchbasins constructed in the balance of the City. Benton City is the only incorporated community in the County without storm drain facilities.

Benton County does not require the construction of sewers for storm water drainage in developments in the unincorporated areas; however a drainage plan is required for all subdivisions and on those short plats wherein natural drainage channels are located. Where necessary, the County does require the construction of catch basins and drywells. Minimum standards require drywells to be at least 10 feet in depth and four feet in diameter; however, larger structures may be required depending upon the expected magnitude of the storm water flow. Once installed, the County maintains the systems. Maintenance performed is primarily the removal of silt which periodically builds up in the drywell chamber.

Where drywells are not required, the County may require the use of natural drainage channels in new developments. Natural drainage easements are dedicated at minimum widths of 20 feet following the centerlines of natural drainage ways. Wider easements may be required, depending upon expected flows. In some instances, the County may allow ditching to reroute water which would otherwise flow in natural channels.

Solid Waste

There are currently two solid waste landfills located in Benton County. One is operated by the City of Richland, the other by a private operator in the Prosser area. Five separate franchises for solid waste collection currently exist in the County, the boundaries of which are shown on Map 19. Richland's solid waste is disposed of in a sanitary landfill located near State Route 240 in northwest Richland. Disposal of solid waste from Kennewick, Benton City, West Richland and vicinities occurs at the Pasco landfill in Franklin County. Prosser's solid waste is taken to the private landfill located north of the City.

The Benton-Franklin Regional Solid Waste Management Plan and Program completed by the Benton-Franklin Governmental Conference in 1977 found that the most reliable figures available at that time indicated that solid waste loading originating in the City of Richland in 1976 was 25,000 tons or 4.564 pounds per person per day. Assuming that these figures are reasonably reflective of Countywide averages, and based upon the study's projected increase in per capita solid waste output, it can be estimated that in 1980, Benton County's population of 109,444 produced approximately 572,611 pounds of solid waste per day or approximately 104,500 tons per year.

Law Enforcement

All five incorporated cities are served by police departments. The unincorporated areas are served by the County Sheriff's Department. The manpower of the respective agencies is listed in Table 20, along with the number of patrol cars each department has available. Manpower is defined here in terms of front line sworn officers and does not include administrative or support personnel.

The most commonly used standard for determining how well manned a law enforcement agency is, is the number of sworn officers per 1,000 population. In the western region of the United States, the average for sheriff's departments is 2 officers per 1,000 population. In Benton County the ratio is .77 per 1,000 population in the unincorporated area - an indication that the Sheriff's Department is undermanned for the population that it is asked to serve.

TABLE 17 : WATER SUPPLY SYSTEMS IN BENTON COUNTY SERVING 25 OR MORE CUSTOMERS

UTILITY NAME	YEAR REPORTED[a]	CUSTOMERS SERVED	PERMANENT POPULATION SERVED	WATER USE (GALLONS) AVERAGE DAY (000)	WATER USE (GALLONS) PEAK DAY (000)	WATER SUPPLY CAPACITY GALLONS PER MINUTE	WATER SUPPLY CAPACITY THOUSAND GALS. PER DAY	WATER STORAGE CAPACITY NUMBER OF RESERVOIRS	WATER STORAGE CAPACITY (THOUSAND GALLONS)
PUBLIC SYSTEMS									
City of Benton City	1979	681	2,043	227	NA	2,100	3,060	1	400
City of Kennewick	1979	13,105	38,000	8,500	16,000	11,200	16,128	8	19,880
City of Prosser	1979	1,371	3,927	1,910	NA	4,975	7,164	3	1,736
City of Richland	1979	10,817	34,251	14,521	35,000	33,194	47,800	8	21,130
City of West Richland	1979	2,500	3,200	640	NA	1,389	2,000	2	550
Columbia Park	1976	50	4	27.5	100	400	578	8	0.7
Plymouth Water District	1979	55	190	8	16	730	1,186	1	250
NON-PROFIT CORPORATIONS, COOPERATIVES, ASSOCIATIONS, ETC.									
Paterson Heights	1978	33	90	54	190	140	201	1	50
Roza Heights	1976	44	150	11	21	80	115	1	25
Sundance	1978	26	100	20	60	135	194	0	---
PRIVATE SYSTEMS									
El Rancho Reata	1978	136	408	58	190	700	1,008	2	280
The Hills Mobile Home Park	1979	275	800	120	140	300	432	1	250K
Barker's 1st Addition	1977	30	90	11.3	22.5	226	326	0	---
Bartleson[b]	1977 & 78	102	85	10.6	21.3	350	504	1	50
Beach Trailer Court	1976	28	25	3.8	4.8	20	29	0	---
Davlyn Village	1976	52	175	21	50	425	612	0	---
Easy Living Mobile Home Park	1976	47	64	100	160	190	274	0	---
Hillview Mobile Home Court	1978	65	80	13.8	27.5	90	130	0	---
Metzger	1976	40	79	6	12	100	144	0	---
Sunrise Acres	1976	40	120	3.2	9	100	144	1	24
3 Wells - 100 Circle Farms	1976	27	80	5	8	72	104	0	---
Tri-City Estates	1976	53	208	94	190	200	288	0	---

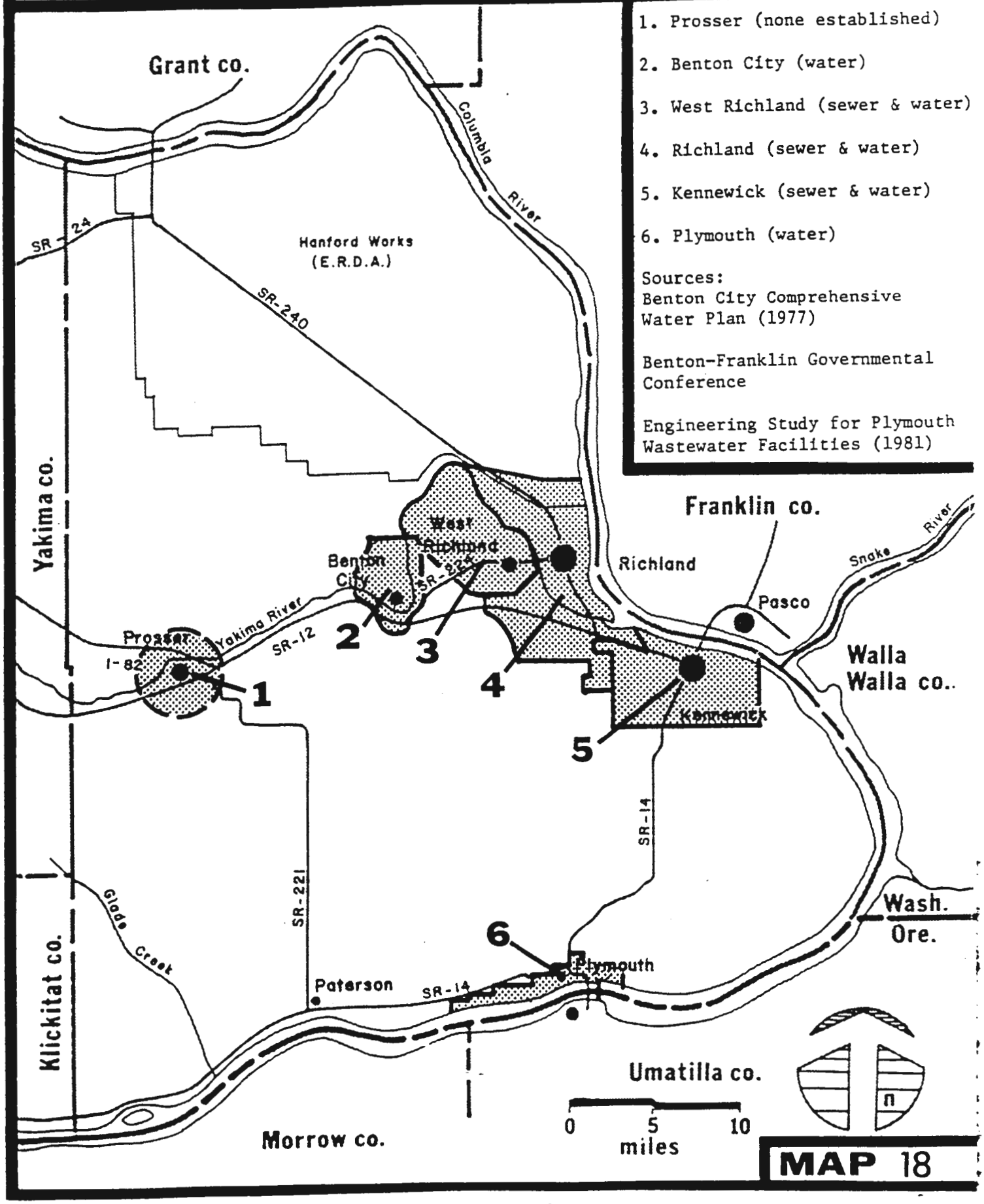
a The year for which the data which follows pertains, as taken from personal correspondence or from Washington Department of Social and Health Services forms DSHS 4-80.

b Includes Lorayne J Ranch and Meadow Springs water systems.

Source: Washington Department of Social and Health Services, and Cities of Benton City, Kennewick, Prosser, Richland, and West Richland; April, 1980.

Benton County Comprehensive Plan

Generalized Municipal Service Area Boundaries



1. Prosser (none established)
2. Benton City (water)
3. West Richland (sewer & water)
4. Richland (sewer & water)
5. Kennewick (sewer & water)
6. Plymouth (water)

Sources:
Benton City Comprehensive Water Plan (1977)

Benton-Franklin Governmental Conference

Engineering Study for Plymouth Wastewater Facilities (1981)

MAP 18

TABLE 18: WASTEWATER TREATMENT SYSTEMS IN BENTON COUNTY

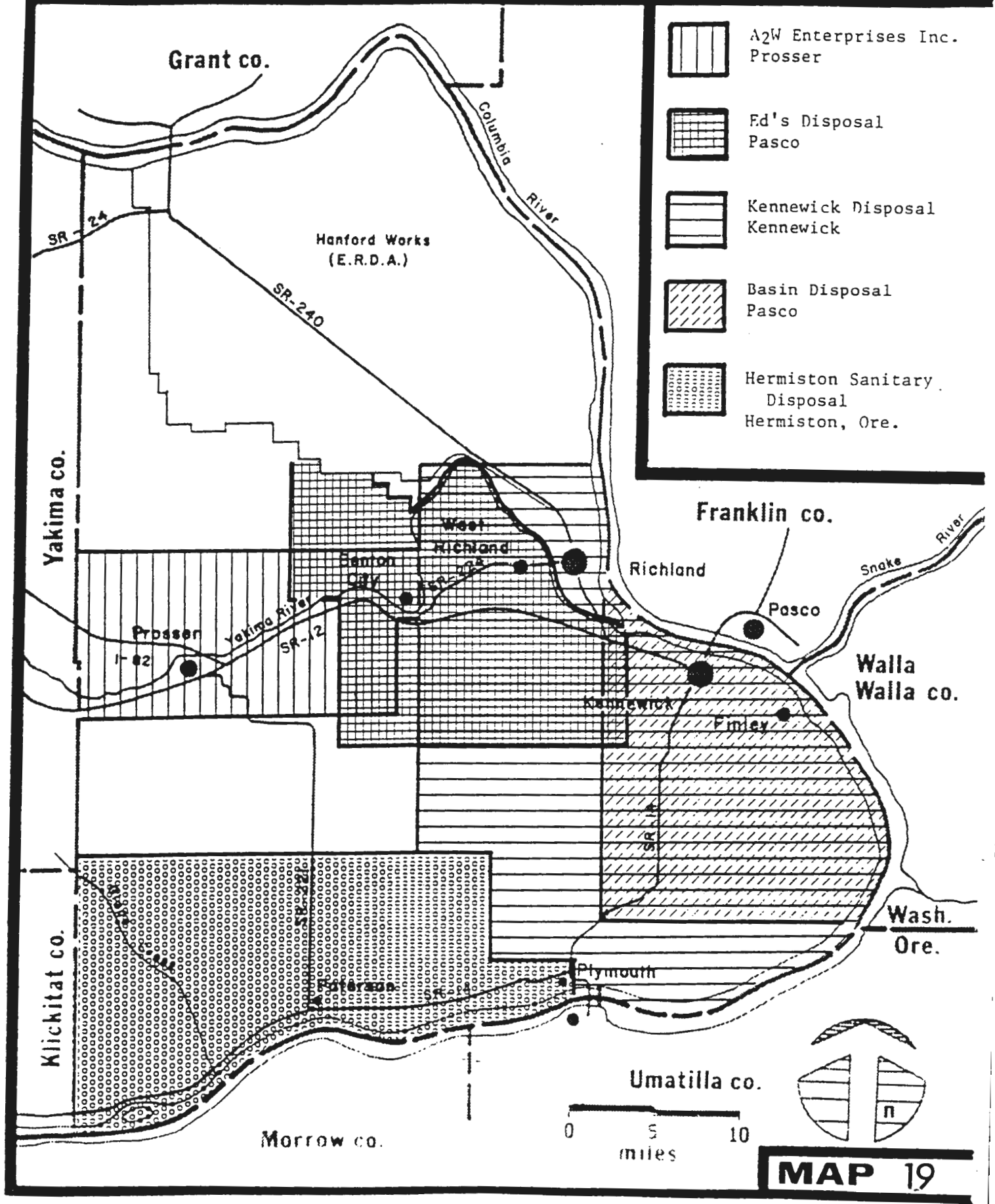
NAME OF SYSTEM	YEAR REPORTED	CUSTOMERS SERVED	POPULATION SERVED	POPULATION CAPACITY	PERCENT CAPACITY	AVERAGE DAILY FLOW (THOUSAND GALS./DAY)	PLANNED IMPROVEMENTS	
							YEAR	POP. CAPACITY W/IMPROVEMENT
City of Benton City	1979	826	2,000	1,500	133	130.0*	1981	5,000
City of Kennewick	1980	8,261	31,084	90,000	35	4,800.0**	---	---
City of Prosser	1979	1,366	3,927	5,000	79	413.0*	1983	5,000*
City of Richland	1980	11,712	34,251	40,000	86	4,790.0**	1987	68,500
City of West Richland	1980	2,500	3,200	3,200	100	320.0*	1981	7,600
Hills Mobile Home Park	1980	150	450	468	96	40.0*	---	---
Poplar Heights Mobile Home Park	1980	57	130	1,500	9	5.0*	---	---
TOTAL		24,872	75,042	141,668	53	10,498.0		---

* Municipal sewage.
** Municipal and industrial sewage.

Source: Benton County Planning Department, May 1980, personal correspondence with representatives from respective utilities.

Benton County Comprehensive Plan

Solid Waste Collection Franchises



MAP 19

TABLE 20: POLICE AGENCY MANPOWER

AGENCY	FRONT LINE POLICE OFFICERS	PATROL CARS
Benton City	5	2
Kennewick	37	14
Prosser	7	3
Richland	30	9
West Richland	9	3
Benton County Sheriff	25	16
TOTAL	113	47

Source: Respective police departments, 1980.

Fire Protection

The five incorporated communities and portions of the remaining unincorporated area of Benton County are served by a mixture of municipal and rural fire departments. Richland and Kennewick municipal fire departments are manned by full-time firemen, while Prosser and the rural districts are principally manned by volunteer personnel. A mutual aid cooperative agreement exists between Richland, Kennewick, Pasco, and Benton City. Table 21 presents the manpower of each department. Map 20 indicates the general location of the rural protection district boundaries in the County.

TABLE 21: FIRE DEPARTMENT MANPOWER

JURISDICTION	PERSONNEL		
	FULL-TIME	VOLUNTEER	TOTAL
City of Kennewick	23	0	23
City of Prosser	1	10	11
City of Richland	37	0	37
Rural Fire District No. 1	1	74	34
Rural Fire District No. 2	0	34	75
Rural Fire District No. 3	1	11	12
Rural Fire District No. 4	1	17	18
Rural Fire District No. 5	1	68	69

Source: Benton County Department of Emergency Services, 1980.

Educational Facilities

Public Schools

The County is divided into seven school districts. All districts are located entirely within the County with the exception of the Grandview district, which is principally located in Yakima County but includes approximately six square miles of Benton County stretching three miles north and south of Highway 12 at the Yakima County Line. All school districts offer kindergarten through twelfth grade education except the Paterson School District, which contracts grades 6-12 (middle and high school levels) with the Prosser School District. Public School facilities and pupil enrollments for each district for the 1979/80 school year is presented in Table 22.

Higher Learning

Columbia Basin College, located at Pasco in adjacent Franklin County, is the primary college in the area. Columbia Basin College is a two year community college offering a wide range of academic, vocational and night school programs. Enrollment totalled 8,300 in November of 1979. Within Benton County, located in Richland, is the Joint Center for Graduate Study, owned and operated jointly by the University of Washington, Washington State University and Oregon State University. The Center offers graduate level courses in science and engineering, leading to the Master of Science degree. Undergraduate programs are also offered in the fields of chemical, nuclear, mechanical and electrical engineering.

Benton County Comprehensive Plan

Fire Districts

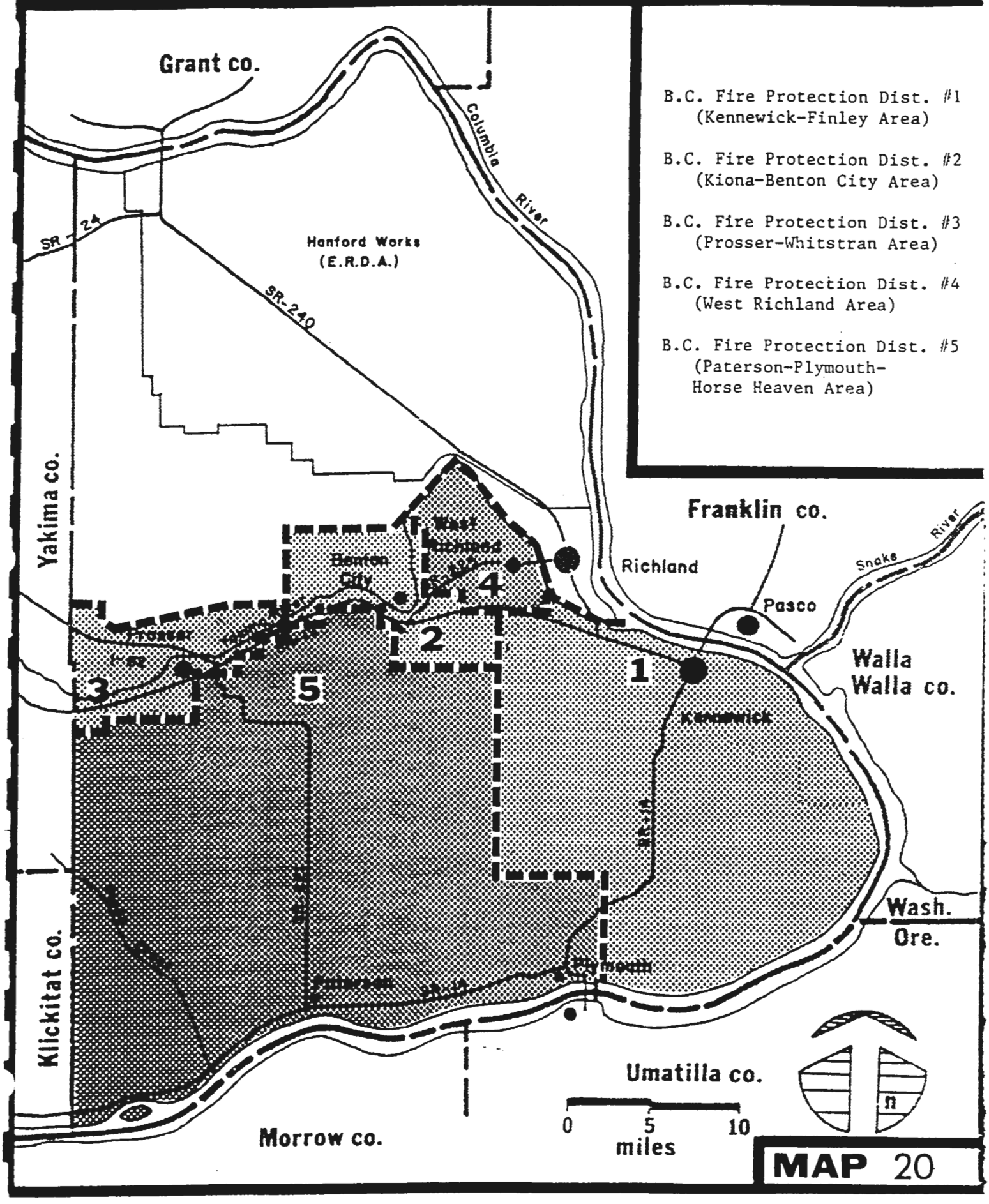
B.C. Fire Protection Dist. #1
(Kennewick-Finley Area)

B.C. Fire Protection Dist. #2
(Kiona-Benton City Area)

B.C. Fire Protection Dist. #3
(Prosser-Whitstran Area)

B.C. Fire Protection Dist. #4
(West Richland Area)

B.C. Fire Protection Dist. #5
(Paterson-Plymouth-
Horse Heaven Area)



MAP 20

Library Services

The Mid-Columbia Library includes both Benton and Franklin Counties and is directed by a board of seven members appointed jointly by the Benton and Franklin County Commissioners. The district's main library is located in Kennewick, while branch libraries are located in towns in both counties. The rural areas are served by a bookmobile that maintains a scheduled route throughout the district.

TABLE 22: PUBLIC SCHOOL FACILITIES AND ENROLLMENTS

SCHOOL DISTRICT	SCHOOLS				ENROLLMENT			
	ELEMENTARY	MIDDLE OR JUNIOR HIGH	HIGH	TOTAL	ELEMENTARY	MIDDLE OR JUNIOR HIGH	HIGH	TOTAL
Finley (No. 53)	1	a	1	2	476	139	290	905
Grandview (No. 200)	---	---	---	---	NA	NA	NA	60[b]
Kennewick (No. 17)	10	3	2	15	5150	2350	3300	10800
Kiona-Benton (No. 52)	1	c	1	2	573	230	346	1149
Paterson (No. 50)	1	0	0	1	47	---	---	47
Prosser (No. 116)	2	1	1	4	870	470	635	1975
Richland (No. 400)	9	2	2	13	4103	1641	2580	8522[d]
TOTAL	24	6	7	37	11219	4830	7151	22398

a. Finley middle school classes are held in the high school building.
b. Estimated number of Benton County residents attending Grandview schools.
c. Benton City middle school classes are held in the elementary school building.
d. Total includes 198 pupils in Richland's special education program.

Sources: Educational Service District 123, November 1979, School Directory 1979-80, Pasco, Washington; and Grandview School District 200, May 1980, conversation with Richard Miller, Junior High School Principal, Grandview, Washington.

The district libraries contain approximately 218,000 volumes. Approximately $150,000 annually are expended for such items as books, films, magazines, and newspapers, which are made available to residents from the library facilities and bookmobile.

The Cities of Richland and Prosser have their own city libraries which are not part of the countywide district. Richland's library contains approximately 120,000 volumes, while Prosser's has approximately 23,500.

Health Services

Medical Facilities

General hospitals are located in Richland, Kennewick and Prosser providing County residents with in-patient care. The Kennewick and Prosser hospitals are each operated by a public entity in the form of a hospital district directed by elected board members, while the Richland hospital is privately owned and operated. In Franklin County, a general hospital is located in Pasco. Benton County is also served by a variety of public and private medical clinics providing treatment for most medical concerns.

A check of the Tri-City and Prosser telephone books indicated that 127 MD physicians and surgeons are listed in Kennewick, Richland and Pasco. Another 15 are also listed from the lower Yakima Valley (Prosser, Sunnyside and Grandview) bringing the total number of local doctors available to 142. Given the 1980 population of Benton county of 109,444 there is one doctor available per 771 population in the County.

Benton-Franklin District Health Department

This regional health agency is responsible for a wide variety of health related programs in Benton and Franklin Counties. Some examples of its activities are immunization clinics, approval of on-site sewage disposal systems (e.g., septic tanks), venereal disease clinics, tuberculosis clinics, and registration of birth and death certificates.

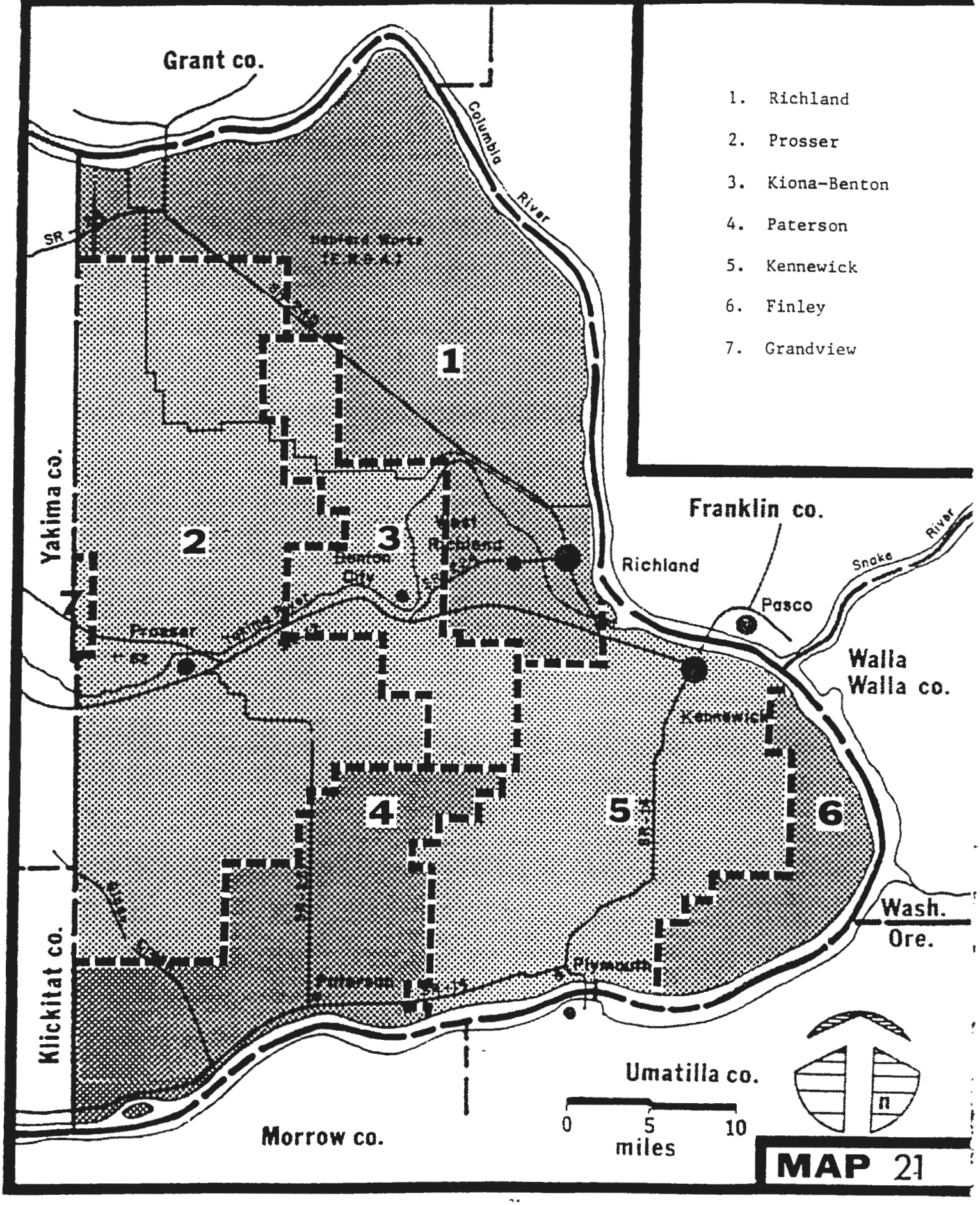
Central Washington Health Systems Agency

Benton county is one of eight counties included in the Central Washington Health Systems Agency, a public regional planning body directed by a 29 member board of area residents representative of consumers and providers of health care. The broad purposes of the agency are to improve the health of area residents, increase the accessibility, acceptability and continuity of health services, restrain the cost of providing health services, and prevent unnecessary duplication of health resources. The agency is guided by a health systems plan, which is generated by agency

Benton County Comprehensive Plan

School Districts

1. Richland
2. Prosser
3. Kiona-Benton
4. Paterson
5. Kennewick
6. Finley
7. Grandview



MAP 21

staff and local advisory groups, and contains goals for the eight county region.

Mental Health

In Benton County, mental health care is provided by the Mid-Columbia Mental Health Center in Richland, a private non-profit corporation which provides both in-patient and out-patient care. The facility is housed in a 40,000 square foot building, and provides 31 beds, day treatment programs out-patient counciling and emergency services (crisis management). Professional staff include 3 psychiatrists and 4 licensed psychology PhD's. In addition to the center's staff, one psychiatrist and 3 licensed psychology PhD's are in private practice in Richland and one licensed psychology PhD is on staff at the Hanford Environmental Health Facility in Richland.

The Mid-columbia Mental Health Center receives part of their funding from the Benton-Franklin Community Mental Health Retardation and Health Board, a joint county body which advises the Benton and Franklin County Commissioners on mental health related matters. Benton and Franklin Counties contract with the Mid Columbia Mental Health Center in providing mental health services. For more detailed information regarding medical statistics for Benton County, see the Environmental Impact Statement, August, 1980, for this Comprehensive Plan.

Electricity

The electrical energy supply in Benton County comes primarily from the many large hydroelectric projects in the State, much of which is pooled in the Bonneville Power Administration (BPA) transmission grid system. Electric utility companies hook into the BPA grid, distributing power to local users. A small proportion of the total energy fed into the grid is produced by thermal generation plants heated by coal and nuclear fuels. Additional generating capacity in the future is expected to come from the addition of power generators on existing hydroelectric dams and construction of additional thermal generating plants.

Within Benton County, electricity is distributed by three public utilities; the Benton Public Utility District (BPUD), the Benton Rural Electric Association (REA) And the City of Richland. The BPUD serves the largest population of the three, providing the greatest share of the County's electrical energy requirements. Their service area encompasses most of the County exclusive of the cities of Richland and West Richland, the communities of Plymouth and Paterson and those rural areas served by the REA. The BPUD serves the cities of Prosser, Benton City and Kennewick, the rural areas along the northern shoreline of the Columbia River in the southern part of the County, the Finley area, Badger Canyon, Red Mountain, much of the Horn, the area along the south bank of the Yakima River between Prosser and Benton City, and the area north of the Yakima River extending approximately three miles north, five miles west and four miles east of Prosser. The City of Richland serves the city area and the unincorporated lands to the south as far as the East Badger Lateral Canal. The balance of the County is served by the Benton R.E.A. Information provided by the utilities indicates that 1,993,382,463 kwh of electricity were sold in 1979, representing a per capita consumptive use of 20,466 kwh.

Natural Gas

In Benton County, natural gas is provided entirely by Cascade Natural Gas Corporation, which distributes to residential, commercial, and industrial users. Their service area currently encompasses the Richland, and Kennewick urbanized area, the Finely industrialized area, and the Prosser urbanized area. In the Prosser vicinity, the industrial areas immediately to the east, and the rural area approximately 1½ miles along Hinzerling Road to the north, are also served.

Consumption of natural gas by Benton County users in 1979 is presented in Table 23. As shown, commercial and industrial users are the major consumers, using nearly 85 percent of the total amount provided. Total per capita annual consumption of natural gas for 1979 amounted to 15,977 cubic feet.

Telephone Service

Telephone service in Benton County is provided by General Telephone Company of the Northwest, Inc., which provides service to Benton City, Finley, Kennewick, Plymouth, Richland, West Richland and outlying vicinities and parts of the Hanford Reservation; and by United Telephone Company of the Northwest, which provides service to Paterson, Prosser, Whitstran and outlying vicinities and portions of the Hanford Reservation not served by General Telephone. The number of customers served by the telephone companies in 1979 is presented in Table 24.

TABLE 23: NATURAL GAS PROVIDED IN BENTON COUNTY - 1979

TYPE OF USE	CUBIC FEET*	PERCENT
Residential	241,599,903	15.5
Commercial	621,759,417	40.0
Industrial	692,769,806	44.5
TOTAL	1,556,129,126	100.0

*As determined from therms sold using the equivalent 1 cubic foot of natural gas = 0.0103 therms.

Source: Cascade Natural Gas Corporation; May, 1980.

TABLE 24: TELEPHONE SERVICE PROVIDED IN BENTON COUNTY

COMPANY	CUSTOMERS[a]	TELEPHONES
GENERAL TELEPHONE CO.		
Residential	33,884	54,040
Business	5,008	14,587
Hanford[b]	NA	7,446
TOTAL	38,892	76,073
UNITED TELEPHONE CO.		
Residential	2,434	3,595
Business	480	1,373
Hanford[b]	158	5,347
TOTAL	3,072	10,315
TOTAL SERVICE		
Residential	36,318	57,635
Business	5,487	15,960
Hanford[b]	NA	12,793
TOTAL	41,805	86,388

[a]Customers are represented by mainstations (a single telephone line). Note that some businesses may be served with more than one mainstation; consequently, data for business customers are not truly reflective of the number of businesses served. As virtually all residences are served with only one mainstation, data regarding residential customers are representative of number of residences (households) served.

[b]Lands encompassed within the U.S. Department of Energy Hanford Reservation.

Source: Correspondence with respective telephone companies; May, 1980.

Mosquito Control

The Benton County Mosquito Control District is established to eradicate mosquitoes, particularly the mosquito Culeax tarsalis, which is a carrier of sleeping sickness. The district is administered by a manager, who is directed by seven board members appointed by the Benton County Commissioners. Currently, four members are from the respective city councils of the cities which are within the district (Benton City, Prosser, Richland, and West Richland), and three members reside within the unincorporated area of the County. The district encompasses 285 square miles of the County within the Yakima and Columbia River drainages exclusive of the Horse Heaven and Rattlesnake Hills, the Hanford Reservation and the land encompassed within the 1959 Kennewick City Limits.

A total of 14 trucks and several support vehicles are used in the application of chemical and biological controls to swampy and wetland areas which may be inhabited by mosquitoes. Areas of special concern are along roadways in irrigated lowlands--particularly in those areas where flood and rill irrigation techniques are being used. Roadbeds in lowland areas tend to back up

water flowing from irrigated fields, causing ponding and hence creating mosquito habitat. Other areas of special concern are flood waters along the Yakima River. Small ponds formed when the river overflows its banks can become mosquito breeding ponds. Mosquito eggs can lie dormant in the mud-flats or receding ponds for six to seven years. Areas containing embedded mosquito eggs will quickly become infested with mosquitoes as floods re-occur and eggs hatch. The busiest time of the year for the district is mid-summer, at the time when daylight hours are longest and days are warmest--conditions which are most conducive for hatching mosquito eggs.

LONG-RANGE NEEDS

Water Supply Systems

A rough estimate of the County's long-range water supply needs can be made utilizing the year 2000 population projection (162,245) and estimated water usage figures. For planning purposes average daily water requirements per capita range between 100 and 200 GPCD (gallons per capita per day). Utilizing the higher standard and applying that to the year 2000 projection of 162,245, the result is a projected average daily demand of 32,449,000 gallons for the County by the end of the long-range planning period.

The demand on a maximum day could be expected to be double that of an average day. This would mean that by the year 2000 combined water sources in Benton County might have to be able to supply and distribute up to 64,898,000 gallons of potable water per day.

At the present time (1980) municipal water systems supply approximately 75 percent of the County's domestic water needs. Assuming this ratio holds true through the long-range planning period, the County's municipal water supply systems could be expected to face a total peak demand of 48,673,500 GPD by the year 2000.

Sewer Facilities

Similar to the above estimates regarding long-range water supply needs, projections can be made regarding the County's long-range sewer facilities needs. At the present time approximately 68 percent of the total County population is served by municipal sewage treatment systems. If this ratio holds true for the long-range planning period (20 years) approximately 110,327 people will need to be served by municipal sewage collection and treatment systems by the year 2000 based upon the population projection of 162,245. The Environmental Protection Agency generally accepts 100 gallons per capita per day (GPCD) as an average sewage flow requirement for sizing interceptor sewer systems. Applying this figure to the estimated population to be served results in a projected average daily wastewater flow to be handled by municipal systems of 11,032,700 gallons by the end of the long range planning period.

Utilizing a peaking factor of 2 to provide for maximum day flows as opposed to average day flows results in a projected maximum daily wastewater flow that could have to be accommodated by municipal sewer systems of 22,065,400 gallons.

Facilities planning to meet these kinds of needs is an ongoing process by the management of the municipal wastewater treatment systems. Specific recommendations regarding such considerations as design, construction, cost factors, etc. are under the purview of the engineering studies conducted by the municipalities involved. In addition, the Benton-Franklin Governmental Conference has conducted studies examining the regional aspects of sewage collection and treatment problems in the Benton and Franklin Counties area. Given the treatment technology available, there would appear to be no reason why the anticipated increased demand on the County's municipal wastewater collection and treatment systems cannot be adequately handled, provided that sound engineering practices continue to be followed.

Storm Water Drainage

As urbanization of the County continues, more and more area will become impermeable to runoff water due to paving and construction. As a result, the need for adequate storm drainage systems will increase if serious runoff problems are to be avoided. The cities and County will need to continue to require that development proposals address this problem as they go through the approval process.

Solid Waste

The generation of solid waste per capita has been on the increase for a number of years. Although it is difficult to predict what the County's production of solid waste might be in future years, estimates can be derived using data presented in the Solid Waste Plan, prepared by the Benton-Franklin Governmental Conference in 1977. Based on City of Richland statistics, it was estimated that by 1985 there would be approximately six pounds of solid waste produced per

person per day, and by 1990 approximately seven pounds per person per day. Based upon a 1990 County population projection of 140,329 this would mean a total of 179,270 tons of solid waste per year that would have to be disposed of or recycled by 1990.

Law Enforcement

As the County grows it will take on an increasingly urban character. Historically one characteristic of this type of change is an increase in the crime rate and crime-related problems. A concurrent growth of the city police departments and County Sheriff's Department will be necessary in order to deal with this problem.

Using the rule of thumb of 2 sworn officers per 1,000 population as a standard, it can be anticipated that by the year 2000 a total of 325 police officers may have to be provided by the law enforcement agencies in the County based upon the year 2000 population projection. This is nearly three times the number of officers currently provided by these agencies. Applying the same rule of thumb to just the unincorporated population and assuming that the unincorporated population remains approximately 30 percent of the County total, it can be estimated that almost 100 officers would have to be provided by the County Sheriff's Department - nearly four times that department's current manpower.

Fire Protection

Long-range fire protection needs will also require increases in equipment and manpower to maintain an effective level of protection. With increased urbanization of the County, increased professionalization as opposed to volunteer service can be expected to occur in some of the County's fire protection organizations.

An additional factor is the integration of fire protection needs with long-range water needs. The source, storage capacity, and distribution systems of water systems, as well as fire hydrant placement in urban density developments, must be adequate to provide sufficient volume and pressure for fire fighting needs.

Educational Facilities

Meeting the County's long-range educational needs comes primarily under the purview of the school districts. There are however, numerous situations in which cooperative efforts between the County and the school districts can benefit the citizens of Benton County. An example of this is the joint use of school recreation facilities.

In addition, estimates can be made of the number of additional school facilities that will be needed over the long-range planning period based upon projecting current ratios out to the population projection of 162,245. In 1980, based upon the County's population and existing number of school facilities, there was one elementary school for every 4,560 people, one middle or junior high school for every 18,241 people, and one high school for every 15,635 people. If these same ratios were to be maintained for the year 2000 population projection, total need would be for 36 elementary schools, nine middle or junior high schools, and 10 high schools. This represents 12 additional elementary schools, three additional middle or junior high schools, and three additional high schools over existing facilities.

Library and Health Services

As the County grows there will be increased demands on library and health facilities and services that will require additional hours, staff, facilities, etc. if the services are to be provided at an adequate level. Other than normal growth factors, it is not anticipated that there will be any unusual problems faced by the library and health service providers as a result of the County's growth.

Electricity, Natural Gas and Telephone Services

Research conducted for the August, 1980 Draft Environmental Impact Statement for this Comprehensive Plan produced per capita usage figures for electricity, natural gas and telephone utilities. A rough estimate of the long-range needs for these utilities can be determined by applying these usage rates to the year 2000 population projection. The resulting figures are shown in Table 25.

TABLE 25: PROJECTED UTILITY DEMAND

UTILITY (unit measure)	1979 PER CAPITA USE	YEAR 2000 PROJECTED DEMAND (total)
Electricity (Kilowatt hrs. per year)	20,466	3,320,506,170
Natural Gas (cubic feet per year)	15,977	2,592,188,365
Telephone (customers)	.43	69,765

CONCLUSION

This element has examined existing and anticipated needs in Benton County for public and quasi-public facilities and services. In many cases, the County is not the primary provider of these facilities and services. However, the importance of coordinated facilities and services planning should not be underestimated, as their adequacy is a significant indication of an area's livability. Planning for the timely and orderly provision of these facilities and services will result in a more efficient accommodation of the County's growth over the long-range planning period.

CHAPTER VIII

TRANSPORTATION ELEMENT

INTRODUCTION

This element of the Comprehensive Plan deals with the systems found in Benton County that provide for the movement of people and goods. Included is discussion of the following systems that make up the total County transportation network: road, rail, air, water, trucking, bus, transit and bicycle.

This element of the Comprehensive Plan includes those items required under R.C.W. 36.70.330, which describes a circulation element as one of two required elements in county comprehensive plans, and as such is designed to meet the requirements of that statute. The term "Transportation Element" is used in recognition of standard county planning practice in Washington and in recognition of the broader scope of the element than just the minimum requirements.

The importance of good transportation planning is difficult to over-emphasize. A prime example is the importance of good rail and truck service to the firms and industries that constitute the County's economic base. Good transportation links with national and international markets are essential to the County's economic well-being. In addition, the ease with which people can move throughout the County is an important factor in its desirability as a place to live.

As stated in The Practice of Local Government Planning (ICMA, 1979) "The transportation system is the framework upon which the city is built." In many respects this applies to counties as well.

BACKGROUND

Road System

Classification

The major transportation system in Benton County is the road system. In order to better understand road systems, roads are classified according to function. Different agencies - federal, state, and local - utilize a variety of different classification systems based upon various criteria. The following classifications are the result of a generalization and synthesis of the more widely accepted functional road classification systems:

Freeways - Freeways are high-speed through highways with strictly controlled access. Design speed is usually 80 miles per hour, and access is generally provided only at spaced, grade-separated interchanges. Freeways are usually multilane, divided highways designed to serve large volumes of high-speed traffic for long distances, often of an interstate nature.

Arterials - The major purpose of arterial roads is to move large volumes of traffic from one part of the county to another. Access is a secondary function to this primary purpose. Design speed is generally 40-50 miles per hour. Arterials serve those major movements of traffic within an area that are not served by freeways and interconnect the principal traffic generators within an areas. As a rule of thumb, the length of a typical trip on an arterial should exceed one mile.

Collectors - The major purpose of collector roads is to conduct traffic from local residential roads to arterials. Collectors do not handle long through trips and are not continuous for any great length. The function of collectors is often equally divided between movement and access.

Local Roads - The major purpose of local roads is to provide access to adjacent land. Movement is a secondary function. Local roads should not be utilized by heavy trucks except where local delivery is necessary.

To better understand Benton County's existing and proposed road system, the existing and proposed roads have been classified for purposes of this Comprehensive Plan as interstate freeways, state highways, arterials, collectors, and local roads. It is recognized that this classification system is different from the one currently utilized by the County Engineer's Office. The classification system chosen is the result of study and analysis of the salient characteristics of the County's existing and proposed road system and the desire to have coordinated land use and transportation elements of this Comprehensive Plan.

A variety of classification systems (including those currently used by the County and those used by the Federal Highway Administration) were studied prior to chosing this one. The chosen classification system is utilized for purposes of this Comprehensive Plan, and is not in any way intended to indicate any design criteria for any particular road. It is designed to facilitate an understanding of how the County's circulation infrastructure currently operates and how it will be provided for over the long-range planning period.

Interstate Freeways

The interstate freeway routes in Benton County are I-82 and I-182 (see Map 23). I-82 has been completed from the Yakima County line to one mile east of the east Prosser interchange. When completed, I-82 will run east from Prosser along the current route of State Route 12, past Benton City, skirting the southern part of the City of Richland and connecting with State Route 14 immediately south of the City of Kennewick. From there the freeway will follow the current route of State Highway 14 south to the Columbia River, crossing at the present site of the Umatilla Bridge.

The entire length of I-82 runs from I-90 at Ellensburg, Washington to I-84 near Hinkle, Oregon. The intent of the freeway is to provide a more direct connection from the Seattle and Puget Sound area to Salt Lake City, Utah, and points south and east.

I-182 is designed to branch off from I-82 at the area referred to as Goose Gap, approximately two miles west of the Richland city limits. The freeway will cross the Yakima River at a point just south of SR-240, will parallel that route in an east-west alignment for approximately one mile, will cross the Columbia at Columbia Point, and will then proceed on to Pasco in Franklin County. I-182 provides a direct link between I-82 and the Tri-Cities urban area.

The completion of the I-82 and I-182 freeways in Benton County will have substantial long-range impacts upon the development of the County. The freeway routes will be the major east-west and north-south routes in the County. Development pressure along these routes can be expected to intensify, especially at interchanges, of which there will be approximately 16 (see Map 24). Access will be provided only at these interchanges.

State Highways

There are eight state highways located in the County. These highways provide the basic circulation network that provides service to all developed regions within the County as well as providing connecting routes to the surrounding counties. The following is a brief description of these highways.

Access on state highways is controlled by the Washington State Department of Transportation (WSDOT). In terms of access, state highways in Benton County fall into two general categories - restricted access and non-restricted access. Direct access from adjacent properties is strongly discouraged and tightly controlled by WSDOT on its restricted access highways. Access onto non-restricted state highways is less tightly controlled but still subject to various traffic engineering standards and criteria.

U.S. 12 - This is the major east-west route that traverses the mid-section of the County from the Yakima County line just east of Grandview for a distance of approximately 40 miles to Kennewick. As such, it provides the major connecting link for the most densely populated portion of the County, i.e., the Yakima River Valley and the Tri-Cities urban area. The route is actually a U.S. highway which begins in Aberdeen on the Pacific coast, continues on through the state to Idaho and Montana, eventually terminating in Michigan.

S.R. 14 - This highway runs along the north bank of the Columbia River from the Klickitat County line, past Crow Butte State Park and Paterson to Plymouth where it turns north to Kennewick. S.R. 14 terminates at its intersection with S.R. 12 in Kennewick. The route actually begins in Vancouver, Washington, travelling through Clark, Skamania, and Klickitat Counties along the Columbia River. This highway provides the major arterial road service in the southern and southeastern Horse Heaven Hills portion of Benton County. It also serves as the major route between the Tri-Cities and Oregon and will continue to do so until I-82 is built along this route between the Tri-Cities and I-84 in Oregon.

S.R.-143 - This State Highway runs for only about two miles from S.R. 14 in Plymouth to the State line on the Umatilla Bridge. Its primary function had been to connect S.R. 14 with that bridge and points in Oregon but, with the alignment created by the construction of I-82, this highway will no longer be needed in the State system. With the completion of I-82, S.R. 143 will be deeded back to Benton County.

S.R.-221 - This State Highway runs for approximately 26 miles in a north-south direction between Prosser and Paterson. As such, it connects I-82 and S.R. 22 with S.R. 14. It is the major

route in the western Horse Heaven Hills portion of Benton County, providing arterial service to many of the large-scale agricultural operations found in that area.

S.R.-22 - This route only travels for about seven miles in Benton County. It originates in Prosser at an intersection with I-82 and runs west along a route parallel to the Yakima River, crossing the County line and continuing on to Toppenish, where it turns north and terminates at an intersection with U.S. 12 south of the City of Yakima.

S.R.-224 - This State Highway runs for about 10 miles from Benton City to West Richland and Richland. It provides a connection between I-82 at Benton City and S.R. 240 at Richland. It is often used by motorists travelling from the western part of the County to Richland.

S.R.-240 - S.R. 240 runs for approximately 36 miles - its entire length being in Benton County. It begins at an intersection with U.S. 12 in south Richland, forms what is commonly referred to as the "By-Pass Highway" as it skirts the western edge of Richland, then proceeds north to the Hanford Nuclear Site. The route runs in a northwesterly direction within the Hanford area, travelling through the Cold Creek Valley. S.R. 240 terminates at its intersection with S.R. 24 in the northwestern corner of the County. S.R. 240 is an extremely important highway as it is the major access route to the Hanford Site.

S.R.-24 - This State Highway runs for about 13 miles through the north-western corner of the County as it travels from the City of Yakima to the City of Othello in Adams County. It does not serve any significant populated area of Benton County other than to serve as a connector to S.R. 240.

Table 26 provides information regarding 1978 average daily traffic counts (ADT), percent truck and bus traffic, and ADT percentage increase figures for the state highways in Benton County. It is interesting to note that State Routes 14, 22, 143, and 221 show the largest percentage of truck and bus traffic.

Arterials

City and County arterials within Benton County provide a lower level of through circulation than is provided by either the interstate or state highway systems, but they do provide the kind of through arterial service that is needed in order to get from one part of the County to another in those areas where the higher levels of highway are not located. An example is Horn Road which is maintained jointly by the County and Benton City. This arterial runs from U.S. 12, through Benton City to S.R. 240, and to some extent is used as an access route to the Hanford Site. Direct access from adjacent properties onto arterials should be discouraged whenever alternative access is or can be made available.

The circulation plan maps do not segregate city or county arterials into a more detailed classification. For purposes of this Comprehensive Plan, local arterials are seen together as constituting the third level of road service in the County after the interstate freeway and state highway systems. These three levels of circulation service, both existing and proposed, are shown on the circulation plan maps. It is these three levels that provide the basic circulation network that allows people and goods to travel by road from one part of the County to another, and that provides for road traffic into and out of the County.

Collectors and Local Roads

Collectors and local roads, the last two levels of circulation service, are not shown on the transportation maps. These two classifications of roads include all remaining roads in the County. Both classifications will have direct access from adjacent properties.

The collectors are those roads which connect local roads with the arterials or higher classification roads. Local roads are those roads whose major function is to provide access to properties adjacent to them.

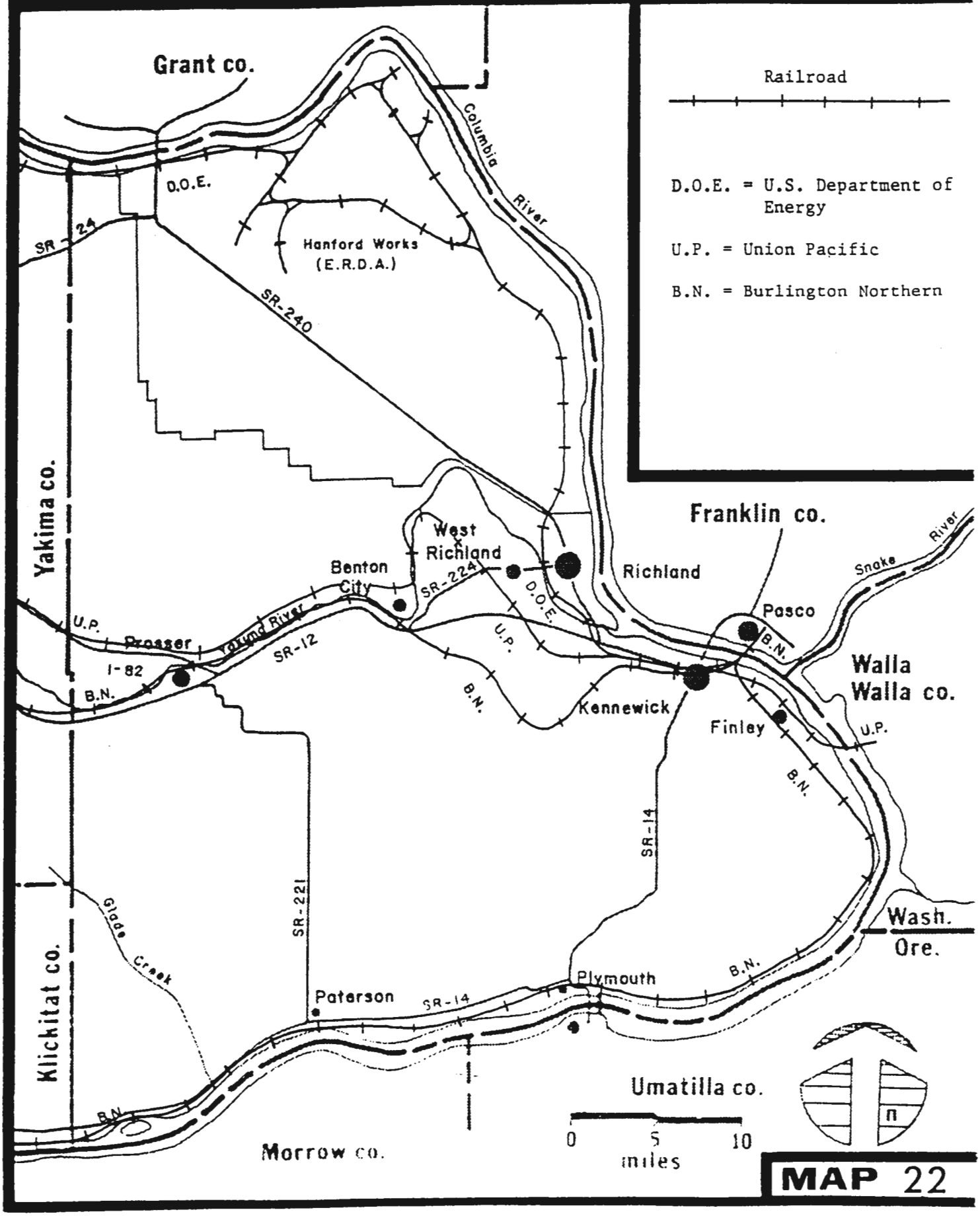
In general, the County appears to be well served by the circulation network in the area. As stated in the 1976 Final Environmental Impact Statement on the proposed I-82 and I-182 routes, "A system of state and county highways provides access throughout the area and provides links to other parts of Washington and to U.S. Highways".

Rail System

Rail service is provideo to all of the County's communities and industrial sites. The Kennewick and Finley industrial areas are served by both the Burlington Northern and Union Pacific Railroads whereas Richland, West Richland, and Benton City are served only by the Union Pacific; and Kiona, Paterson, Plymouth, Prosser and Whitstran are served only by the Burlington Northern. The United States Department of Energy (DOE) controls rail access into the Hanford Reservation.

Benton County Comprehensive Plan

Railroads



MAP 22

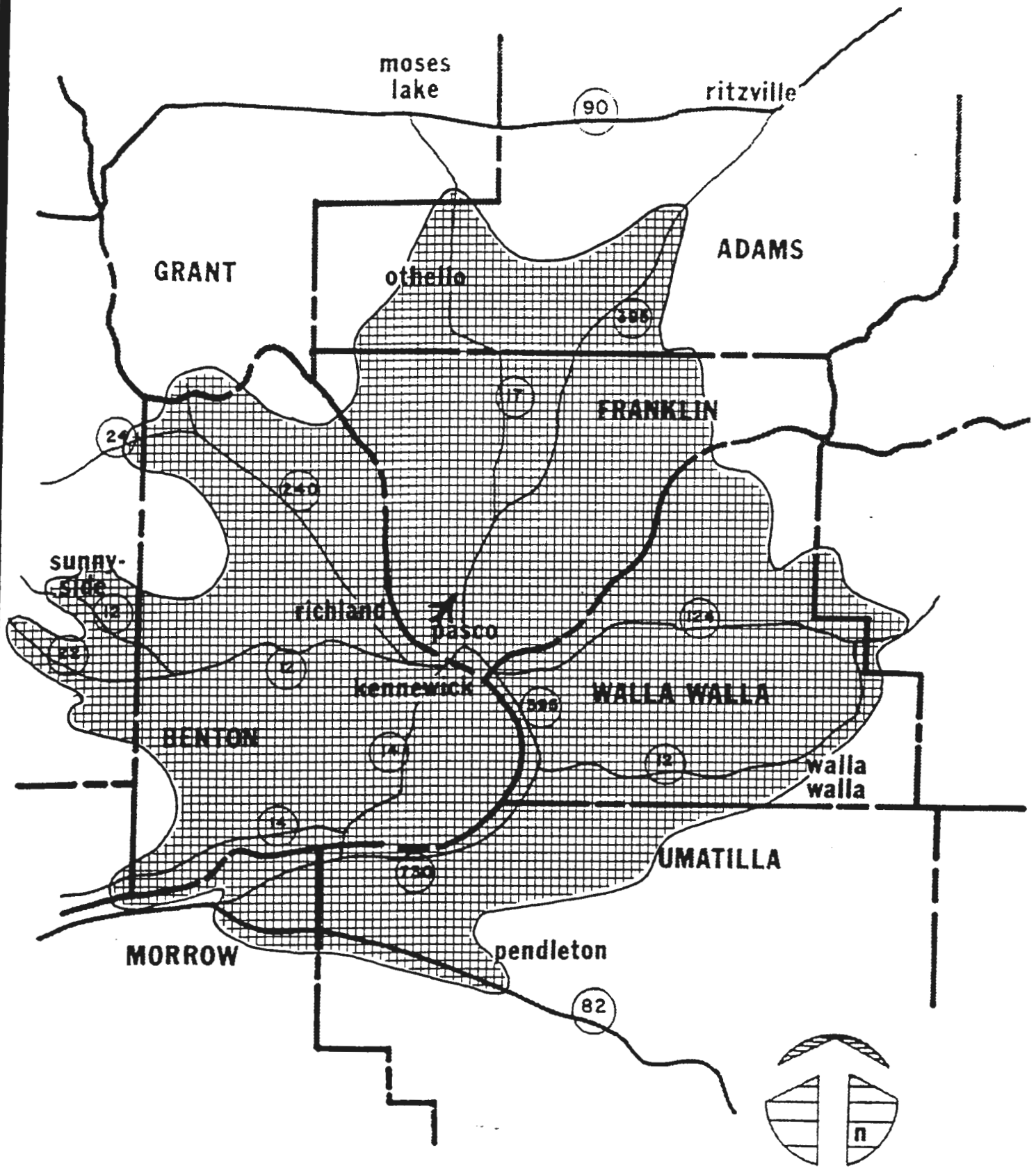
TABLE 26: STATE HIGHWAY TRAFFIC VOLUMES

STATE HIGHWAY	LOCATION OF COUNTER	AVERAGE DAILY TRAFFIC (ADT) 1978	PERCENT TRUCK & BUS TRAFFIC	PERCENT AVERAGE ANNUAL INCREASE IN ADT: 1975-1978
US 12	Yakima County line	6300	11	6
	West Prosser	9800	11	11
	East Prosser	5000	11	14
	West Kiona	5700	11	5
	East Kiona	4800	11	7
	Richland "Y" (West of junction)	7100	11	8
	Richland "Y" (East of junction)	34900	8	11
	Junction SR 14 (West)	32200	8	12
	Franklin County line	49300	8	16
SR 14	Klickitat County line	900	21	18
	West Paterson	1160	21	5
	East Paterson	2400	19	7
	Junction SR 143 (West)	2850	19	8
	Junction SR 143 (North)	2850	19	10
	South Kennewick	5700	19	11
	Junction SR 12	27500	13	14
SR 22	Yakima County line	4050	15	12
	West Prosser	3700	15	13
	Junction SR 221 (West)	3450	15	7
	Junction SR 221 (North)	2650	15	9
	Junction SR 12	2300	15	7
SR 24	Yakima County line	2400	11	25
	Junction SR 240 (West)	2550	11	23
	Junction SR 240 (North)	2200	11	16
	Grant County line	2332	11	18
SR 143	Umatilla County Line	5900	19	9
	Junction SR 14	6600	19	11
SR 221	Junction SR 22	3050	17	7
	Junction SR 14	2100	17	16
SR 224	Junction SR 12	2800	7	13
	West West Richland	1950	7	6
	East West Richland	7400	7	5
	Junction SR 240	9500	7	11
SR 240	Junction SR 24	1300	7	7
	Junction Horn Road (North)	1490	7	8
	Junction Horn Road (South)	2000	7	7
	Junction Horn Rapids Road (North)	2750	7	13
	Junction Horn Rapids Road (South) (Richland west city limits)	1700	7	7
	Junction SR 224 (North)	12000	7	6
	Junction SR 224 (South)	13500	7	20
	Junction George Washington Way (West)	17200	7	9
	Junction George Washington Way (East)	45600	7	19
	Junction SR 12	45300	7	19

Source: Washington State Transportation Commission, 1978, Annual Traffic Report, Olympia, Washington.

Benton County Comprehensive Plan

Tri-Cities Airport Service Area



Source: Tri-Cities Airport Master Plan, 1976.

MAP 23

The DOE tracks tie into the Union Pacific tracks southeast of the Richland "Y" interchange of State Routes 12 and 240. The Union Pacific Railroad also serves Richland from this DOE line.

Fertilizers, food products and nuclear-related construction materials and equipment are the principal commodities shipped by rail in Benton County. Manufactured fertilizer products and locally grown grain make up the greatest share of outgoing commodities, while construction supplies and equipment are the principal in-coming productions. Although a large quantity of other food products, such as fresh and processed potatoes and fruit are transported out of the County, most of these products leave by truck rather than rail carrier. Most of the regular rail traffic activity in the County is associated with the Finley and Kennewick industrial areas.

Rail passenger service is available to County residents at Amtrak facilities at Pasco in Franklin County and at Hinkle, Oregon south of Hermiston. From Pasco, trains leave for Spokane and Portland, with connections available in Spokane for points east. At Hinkle, passengers can take a southern route traveling from Portland to Salt Lake City. The rail lines located in the County are shown on Map 22.

Air Service

Benton County is served by four airports: Tri-Cities Airport in Pasco (Franklin County), Vista Field in Kennewick, Richland Airport in Richland, and George O. Beardsley Airport in Prosser. Three of these airports (Tri-Cities, Richland and Beardsley) are included in the National Airport System Plan (NASP), thereby qualifying for federal funding assistance for planning and improvements. Tri-Cities Airport is classified as an air carrier airport, Richland as a commuter service airport, and Vista and Beardsley as general aviation airports.

Although located in Franklin County, Tri-Cities Airport in Pasco, owned by the Port of Pasco, serves as the major air carrier airport for both Benton and Franklin Counties and is in fact a regional air facility serving portions of seven counties in Washington and Oregon. It is one of four air carrier airports in the State, the other three being Seattle-Tacoma International Airport, Spokane International Airport and Yakima Air Terminal. Map 23, has been extracted from the 1976 Tri-Cities Airport Master Plan completed by the Wadell Engineering Corporation and indicates the Tri-Cities Airport service area as found by that study.

Airlines serving Tri-Cities Airport are Northwest Airlines, Cascade Airlines and Horizon Airlines. Northwest Airlines is considered a major trunk carrier which serves the nation and the orient. Cascade Airline is considered a commuter airline with the majority of its flights out of Pasco going to Seattle, Spokane, and Portland. Horizon Air is also a commuter airline with service to Seattle.

Richland Airport is a commuter service airport with commuter airline service being provided by Cascade Airlines. The airport is owned by the Port of Benton. In addition to commuter airline service, Richland Airport has provided most general aviation activities including recreation flying, flight training, charter flights, air taxi service, business flying, glider operations, and skydiving activities.

Vista Field in Kennewick is a general aviation airport. It is not included in the National Airport System Plan (NASP), and thus does not qualify for federal funding for planning or improvement programs. It is however, included in the Washington State Airport System Plan (WSASP) as an airport of special state interest. The WSASP recommends inclusion of Vista Field in the NASP. Activities at Vista Field include recreational flying, flight training, and charter service.

George O. Beardsley Airport is a general aviation facility located at Prosser. Activities have included recreational flying, flight training, air charter, and agricultural application operations.

Water Transportation

The Columbia and Snake Rivers provide an inland commercial water way over 400 miles long extending from the Pacific Ocean to the Port of Benton docking facilities at Richland on the Columbia and to Lewiston, Idaho on the Snake. Navigational locks and a channel maintained at a minimum depth of 15 feet provide for bulk commodity transportation by ocean-going barge.

This inland waterway which links the Pacific Ocean with the State's agricultural "inland empire" forms Benton County's eastern and southern boundaries. In addition to the Port of Benton facilities at Richland, barges can be loaded and unloaded at facilities in Kennewick and Finley.

The principal commodities shipped out of Benton County by barge are wheat and fertilizer products. These products are shipped from privately owned docking facilities located at grain

storage and industrial sites. The principal commodity brought into the County by barge is anhydrous ammonia, which is used in the manufacture of fertilizer. Occasionally, special shipments of items used for the construction of nuclear reactors at Hanford are barged to either the Port of Benton dock at Richland or to various sites upstream in the Hanford Reservation itself. The Port of Kennewick owns properties along a tweive mile stretch of the Columbia River at various locations south of Kennewick, and also a site at Plymouth, below McNary Dam. The Port of Benton is currently in the process of acquiring land immediately west of Plymouth, with the intention of locating a docking facility in the area after the land is acquired. All of the Port of Kennewick lands on the Columbia have the potential for development of facilities to accommodate barge traffic. The extent of waterborne traffic at facilities in Benton County is presented in Table 27.

TABLE 27: WATERBORNE TRAFFIC - BENTON COUNTY

COMMODITY	1979 TONNAGE INBOUND	OUTBOUND
Fertilizer	229,600	52,800
Grain	0	180,000
Construction materials	1,500	0
Salmonoid fingerlings	0	9
TOTAL	231,100	232,809

Source: Personal communication with local industries and port districts, May, 1980.

In addition to the above commodities, hay cubes from corporate farmlands located in the Horse Heaven Hills are also shipped via barge from Benton County. Alfalfa is grown under center-pivot irrigation, processed into pellets and sold to Japan markets. Several thousand tons are barged to Japan annually.

Trucking

Benton County enjoys the services of a full compliment of trucking firms that provide motor freight service to the area. Trucking firms providing serve to the area range from small owner-operator firms to some of the largest transcontinental lines in the nation such as Consolidated Freightways and Pacific Intermountain Express.

Bus Service

Commercial bus lines offer an alternative to the private automobile and carry light freight as well. This transportation mode is especially important to the transportation disadvantaged such as the elderly and handicapped and in many cases is the only means of intercity travel other than the automobile. Greyhound Bus Lines maintains a route that runs across the County with daily stops at Richland, Kiona, and Prosser. From this service, connections can be made to the nationwide bus network.

Public Transit

Existing Systems

In May, 1981, after a previous attempt in 1977 had failed, the creation of a transit system to cover the metropolitan Tri-Cities area in both Benton and Franklin Counties was approved by a 63 percent positive vote in Benton County and a 74 percent positive vote in Franklin County. The measure establishing the transit system provided a funding mechanism of an additional three-tenths of one cent sales tax to be levied in the district. Through these taxes the Benton Franklin Transit System was developed and began operations on May 10, 1982. During the remainder of 1982 the system continued development and by January of 1983 the system was operating 26 buses over 15 fixed daily routes. The system also took over the existing Red Cross Dial-A-Ride service and continued its operation providing service to the elderly and disabled, and instituted a Van Pool service for employee groups interested in low cost service to and from outlying residential areas and employment centers. Overall, during 1982, the Ben Franklin Transit System logged 920,771 vehicle miles and a total of 533,975 passenger trips.

The Prosser Rural Transportation Program (PRTP) operates within a 15-mile radius service area from Prosser and provides service to everyone living within the area by (1) scheduled route, (2) dial-a-ride, and (3) charter service. The charter service is made available to local groups when the vehicles are not being used for regular service. In 1979, the PRTP logged 60,745 vehicle miles, providing 21,441 passenger trips with a total of 433,245 passenger miles.

Bicycle System

At the present time there are very few bicycle facilities available in Benton County. The only facilities available are found in the City of Richland, including a three mile path along the Columbia River from the Howard Amon Park to Leslie Groves Park; and in Benton County's Columbia Park, involving approximately five miles of trails along the Columbia River.

In general, bikeways are classified into three types. The following classification system has been extracted from the Benton-Franklin Governmental Conference's regional bikeway system plan but is essentially the standard classification system found in the literature:

Class I, Bike Path - A bike path is a special pathway facility spatially separated from the travelled roadway area for the exclusive use of bicycles. A bike path may be a portion of the parkway area of a street right-of-way or a special right-of-way not related to the street facility; it may be grade-separated or have street crossing at designated locations. It is identified with standard Bike Path guide signing and also may be identified with pavement markings as necessary. The bike path classification also includes unpaved trail facilities designated for bicycle use. Although bike paths are intended for the exclusive use of bicycles, they may be shared by pedestrian traffic in special applications.

Class II, Bike Lane - A bike lane is a traffic lane within the travelled roadway area specified for preferential use by bicycles. A bike lane is usually located adjacent to the curb. It is identified by standard Bike Lane guide signing, special lane lines and other pavement markings. Bicycles have exclusive use of a bike lane for longitudinal travel along it, but must share the facility with motor vehicles and pedestrians crossing it.

Class III, Bike Route - A bike route is a street identified as a bicycle facility by the standard Bike Route guide signing only. It is located in the travelled roadway area with no special lane markings. The bicycle traffic shares the roadway with the motor vehicle.

There are several bicycle plans that either have been completed or are being completed by various jurisdictions in the County. The Benton-Franklin Regional Bikeway System Plan was completed in 1974-1975 and includes proposed bicycle routes for the two-county area. The City of Kennewick has hired a consultant to prepare a bicycle system plan for that city. The consultant's initial recommendations are expected to be presented in the summer of 1981. The City of Richland has included a trail system in its 1976 Parks, Recreation and School Plan.

Benton County's 1982 Parks and Recreation Comprehensive Plan addresses bike and trail systems through Park Policy #16:

> "The County shall develop a county-wide trail system plan and participate fully in its coordination with city, state, and federal trail plans and implementation programs."

In 1972 the Washington State Legislature enacted R.C.W. 47.30 which requires cities and counties to allocate one-half of one percent of the amount of funds received from the motor vehicle fund for trails and paths. However, in order to spend these funds on the construction of a trail or path, the trail or path must be included in a comprehensive trail plan adopted by the governing body. The bicycle routes designated on the circulation plan maps of this Comprehensive Plan, as well as the related plan goals and policies, fulfill the comprehensive trail plan requirement. Design standards for bicycle facilities are readily available in the Washington State Department of Transportation Design Manual. In addition, Benton County may develop its own design standards as part of a countywide bicycle plan.

LONG-RANGE NEEDS

Road System

In general, the major long-range need in regard to the road system found within Benton County is to continue to plan for and develop a circulation network that will meet the need for the safe and efficient movement of motor vehicles and in some cases bicycles that can be anticipated based upon the long-range growth projections for the County. The ultimate success of such a system will depend to a large extent upon the cooperation of the agencies primarily responsible for road and traffic planning, design, and construction, i.e., the State Department of Transportation, the cities, and Benton County.

There are two portions of this Comprehensive Plan that have been developed to address these long-range circulation needs: (1) the goals, policies and recommendations found on pages 10 - 24, and (2) the Circulation Plan Maps.

As indicated earlier, the Plan maps show existing and proposed interstate freeways, State highways, and County arterials. Insomuch as the Plan is long-range, the proposed alignments are

necessarily general in nature. More specific alignments will be the result of engineering studies and negotiations with landowners. More specific and detailed maps, reports, and studies are available at the County Engineer's Office and the County Planning Department. The information available includes design standards for different classifications of roads as well as more detailed descriptions and analyses of various aspects of the County's road system. For example, the County has three classifications of arterial streets--major arterial, secondary arterial, and collector arterial. Each of these is then further classified as either rural or urban. For purposes of the circulation plan maps of this Comprehensive Plan, it was felt advisable for purposes of clarity to portray the County's important arterial routes (existing and proposed) collectively as "arterials" with more specific and detailed data available at the Engineering and Planning Department Offices.

The road system is the County's basic transportation network for the movement of people and goods both within the County and to areas outside the County. Total automotive travel in Washington State is expected to increase by 35 percent between 1979 and 1990 with the 1990 figure estimated at nearly 40 billion vehicle miles. The percentage increase for Benton County would undoubtedly be higher based upon the County's population projection. At the same time road construction and maintenance costs are rising while funds are shrinking. As stated in the Washington State Department of Transportation's 1980 State Transportation Plan, "An adequate system of roadways is essential for carrying automobiles, intercity buses and local transit vehicles, trucks, and bicycles." Attempting to meet these needs will clearly be a challenging task for agencies such as Benton County that are responsible for road planning, design, construction and maintenance. The goals, policies, recommendations, and maps of this Comprehensive Plan are designed to help meet these needs.

Rail Systems

Railroads play a very important role in the County's economy. They transport grain and fertilizer products out of the County and fertilizers, food products, and construction material and equipment into the County. In addition to freight, Amtrak provides passenger service, available to Benton County residents at Pasco in Franklin County and at Hinkle, Oregon. For the most part railroad transportation planning does not come under the purview of Benton County. However, due to its importance, especially in an era in which energy is becoming an increasingly scarce resource, the County should attempt to work in cooperation with those agencies, both public and private, that are responsible for programs that impact the adequacy of the railroad system in our area.

Air Service

The Washington State Airport System Plan (WSASP) recognizes that the Tri-Cities area is one of the fastest growing areas in the State and that future aviation activity will reflect this growth. The WSASP states that operations at the three Tri-Cities airports are already congested with resulting delays, especially during periods of poor visibility. In addition, the 1978 WSASP projected that the two-county area would experience an increase in aircraft operations of 168 percent from the years 1979 to 2000. Clearly there will continue to be a pressing need for airport planning and improvement if the area's demands for air transportation are to be met.

The WSASP concluded that "the installation of a separate precision instrument landing system (and possibly an Air Traffic Control Tower) at Richland would result in significant relief" . . to the area's congestion . . . "and would greatly assist all airlines operating into this area." It was also concluded that Vista Field in Kennewick provides a significant level of relief to the congestion and should be included in the National Airport System Plan.

Concluding the needs analysis, the WSASP stated "Plans for aviation development have been prepared at each of these airports. However, a system problem exists, and it is suggested that the state and the FAA encourage a regional evaluation and analysis of aviation roles and needs." The different agencies are currently involved in just such a study which is being coordinated by the Benton-Franklin Governmental Conference. It is hoped that this effort will result in a program that will enable the air transportation providers to meet the anticipated long-range air transportation needs of the people of Benton County.

Water Transportation

The long-range needs of the waterborne navigation system are essentially beyond the purview of the Comprehensive Plan. However, it should be recognized that as the County grows in population, and expands and hopefully diversifies its economy, the inland waterway transportation system will continue to be a very important feature. From a broader perspective, it is anticipated that this waterway system will continue to be a vital link between Pacific ports and their markets, and the State's agricultural "inland empire". The importance of this transportation system should be kept in mind as the County reviews development and other proposals that will impact its efficiency or effectiveness.

Trucking and Bus Systems

The County's impact upon the long-range needs of the trucking and bus systems found in Benton County is limited to those items discussed under the Road System section.

Transit System

The initial, important steps have been taken by the people of Benton and Franklin Counties to establish a transit system for the Tri-Cities metropolitan area. The fledgling system will most likely encounter some rocky spots as it develops and implements the transit service, but with the continued support of the local agencies, individuals and groups that have worked for the system's realization, it has the potential of filling a very important local transportation need in the metropolitan area. With the anticipated development of the transit system, the people of the Tri-Cities area will experience a significant increase in the adequacy of transportation available. An entirely new mode of transportation will now be available to serve these transportation needs.

Bicycle Systems

In recent years, the bicycle has become an increasingly popular means of transportation for travel to work, schools, and shopping facilities, as well as for recreational purposes. This trend is expected to continue, and additional actions on the part of local governments will be required if the need is to be met.

To date the demand for bicycle travel in Benton County and its cities has resulted in several planning efforts, one bike path about three miles long, another approximately five miles long, and some arterial bike routes . If the popularity of bicycling continues to increase, more effective utilization of the earmarked motor vehicle funds and other funds may have to be made by the state and local governments if the anticipated increased demand for bicycling opportunities is to be met.

The Washington State Department of Transportation's 1980 State Transportation Plan identified the following major problem areas that will need to be dealt with in order to meet the long-range needs for bicycle transportation.

1. Conflicts with Other Modes and Other Hazards.
   Conditions that make bicycle operations hazardous include the condition and maintenance of riding surfaces and other roadway features, such as expansion joints, drainage grates, lane marker buttons, and railroad tracks. Also, there are conflicts between bicycles and motor vehicles.

2. Inadequate Facilities.
   There are physical and operational hindrances which limit the use of bicycles as transportation vehicles. These include inadequate facilities, incompatible traffic control devices, lack of direct and convenient access to certain areas and activity centers and transportation terminals.

3. Inadequate Parking and Storage Facilities and Accommodations on Other Modes.
   There are inadequate facilities for parking and storing bicycles at many work, school, shopping, and recreational areas and at transportation terminals. Provision of facilities will improve bicycle mobility.

The Circulation Plan maps in this Comprehensive Plan include proposed bikeway locations. As was the case with proposed arterial roads, these proposed locations do not indicate exact alignments. Nor does the Plan include recommendations for the type or class of individual bikeways. Those determinations will have to be made at a later time when traffic engineering standards can be applied. The bikeway proposal is designed to meet the State requirement for a comprehensive trail plan and to provide a framework for a bicycle system that is integrated with city bikeway proposals and that would enable bicyclists to travel throughout Benton County.

CONCLUSION

As has been mentioned, the transportation network is the framework upon which the County is built. The growth projections for Benton County make it clear that there will be substantial demands placed upon all the components that make up the transportation system over the long-range planning period. If the movement of Benton County's people and goods is to be conducted in an efficient and safe manner, a considerable amount of effort will have to be devoted to the planning, design and construction of those facilities required by the various transportation modes. This Comprehensive Plan is designed to help meet the first of those requirements.

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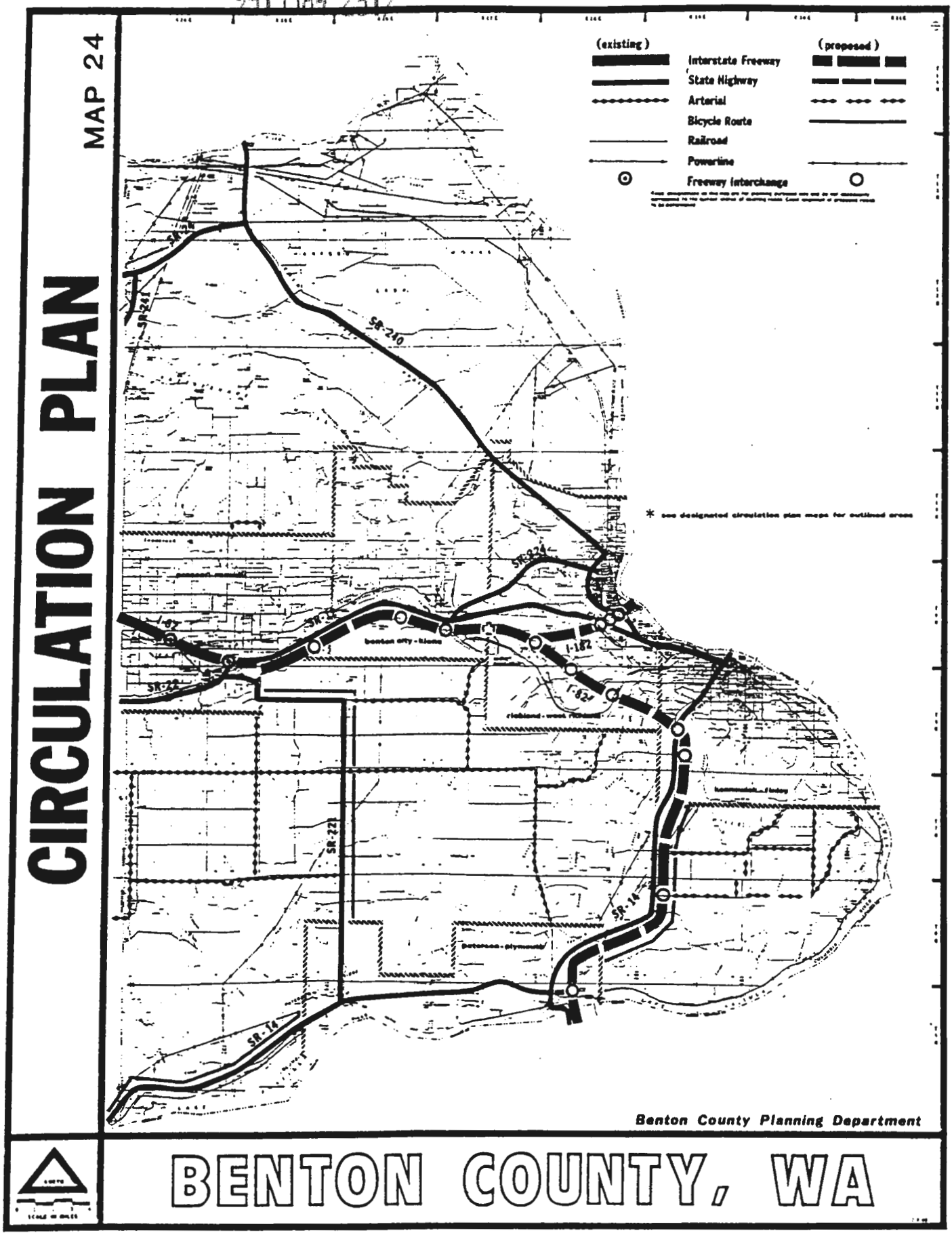
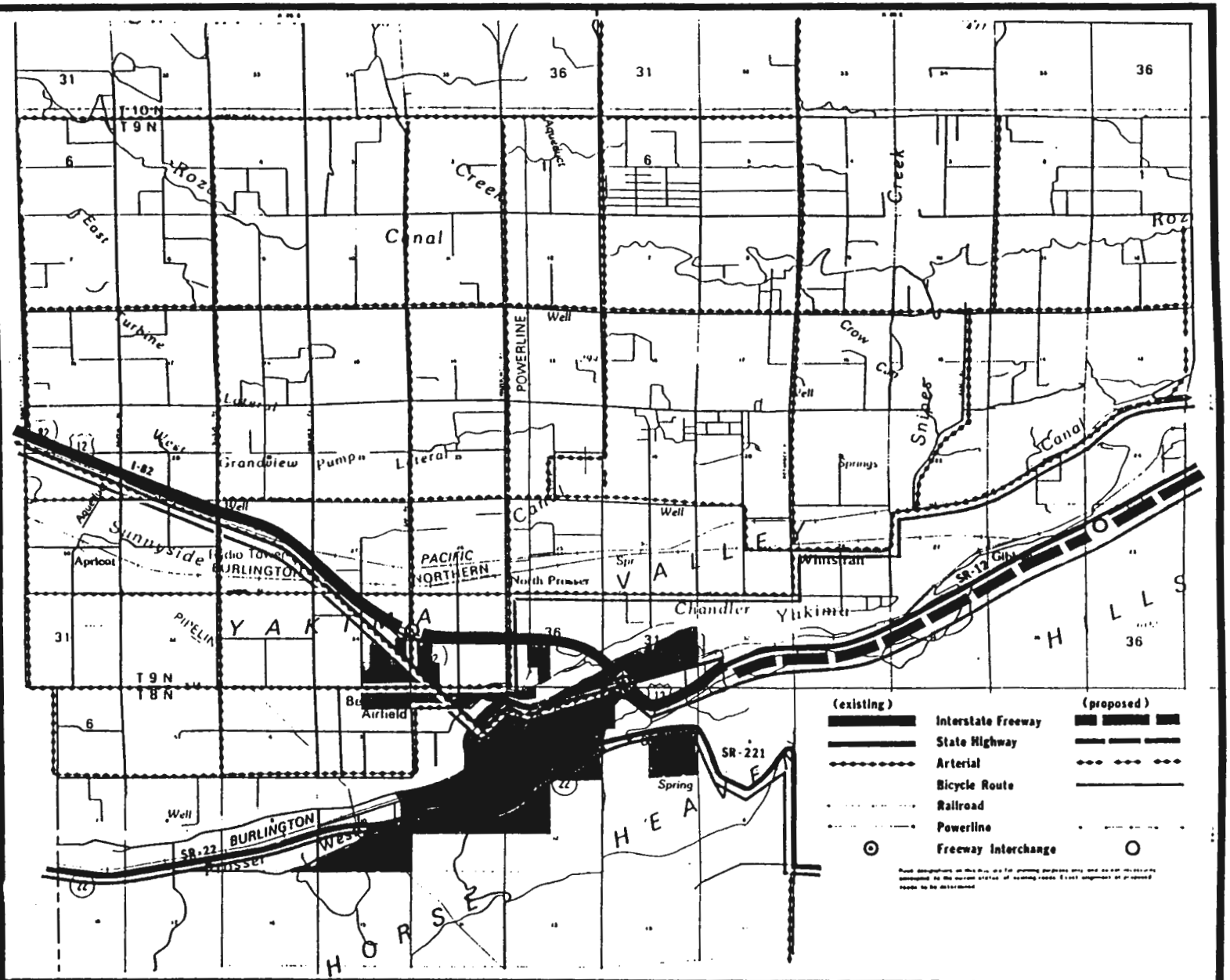


CIRCULATION PLAN MAP 25

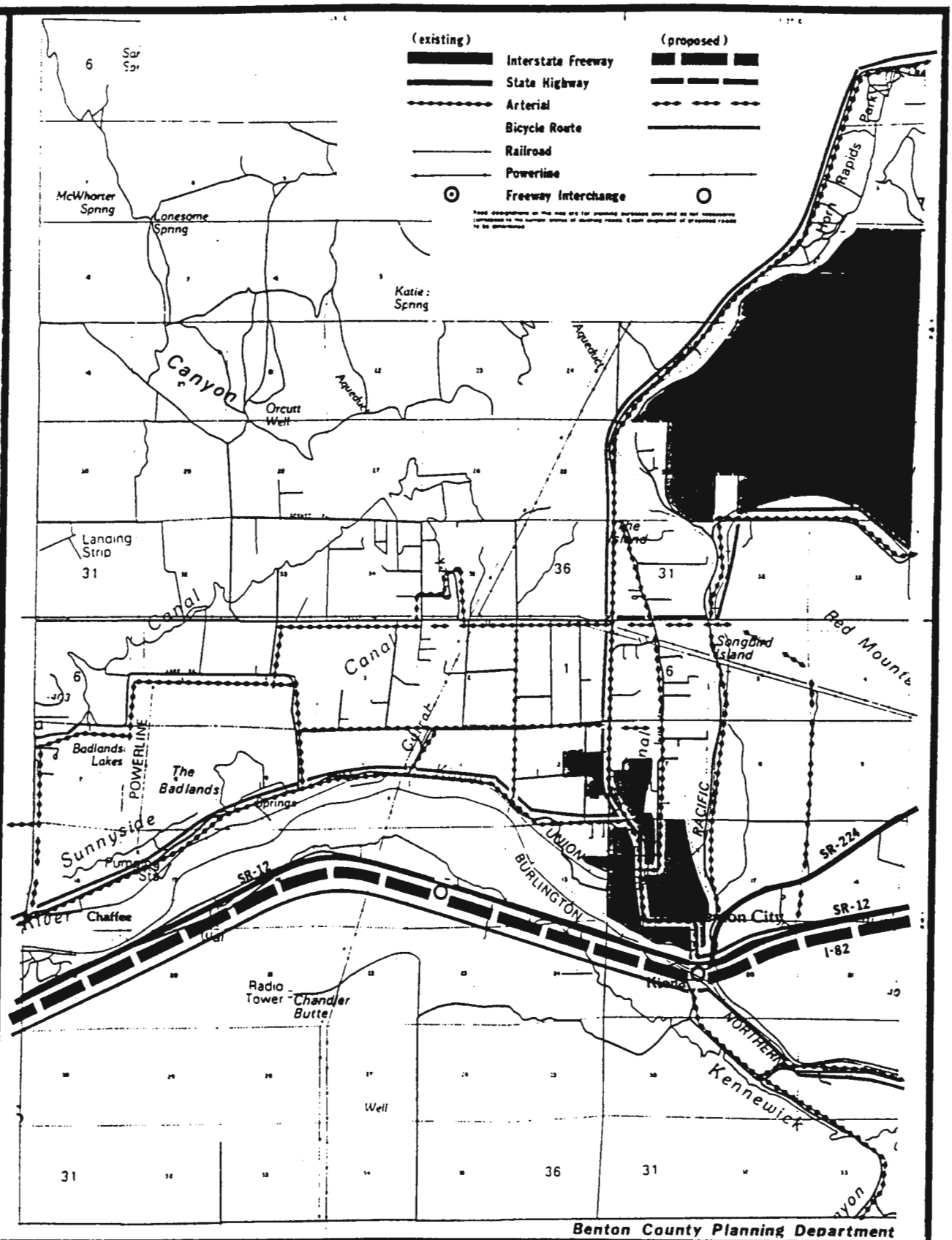


PROSSER - ROZA

Benton County
Planning Department

CIRCULATION PLAN

MAP 26

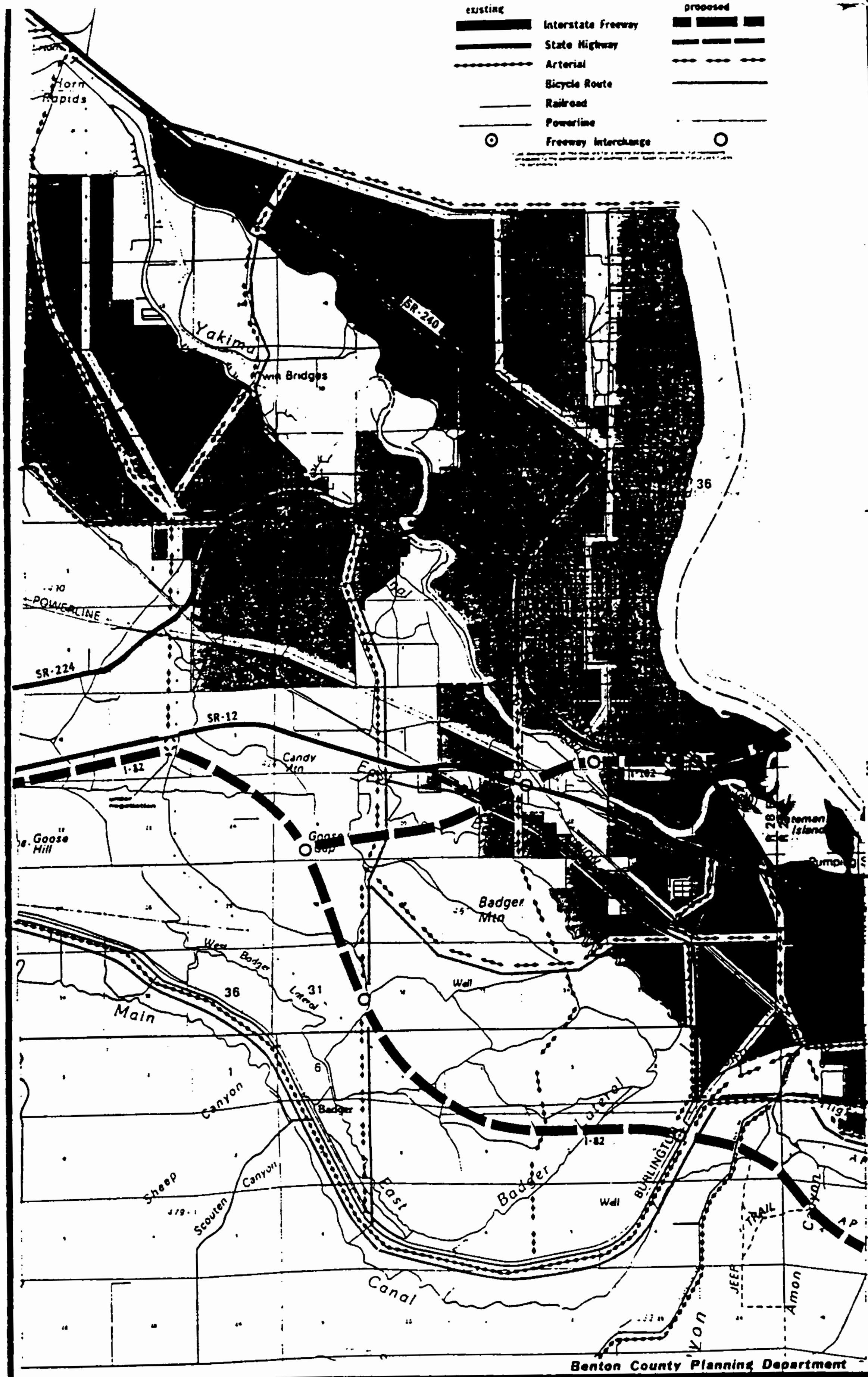


Benton County Planning Department

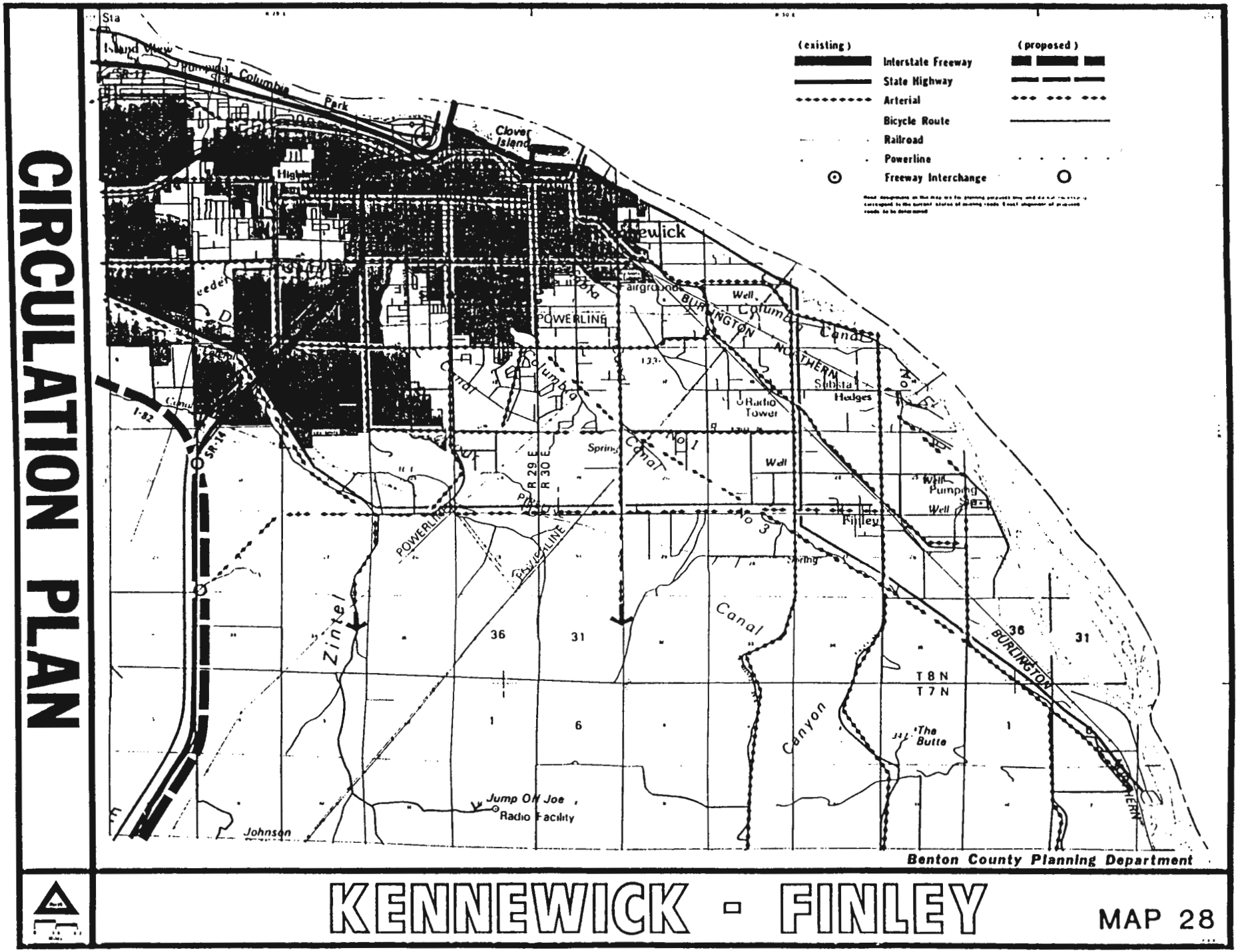
BENTON CITY - KIONA

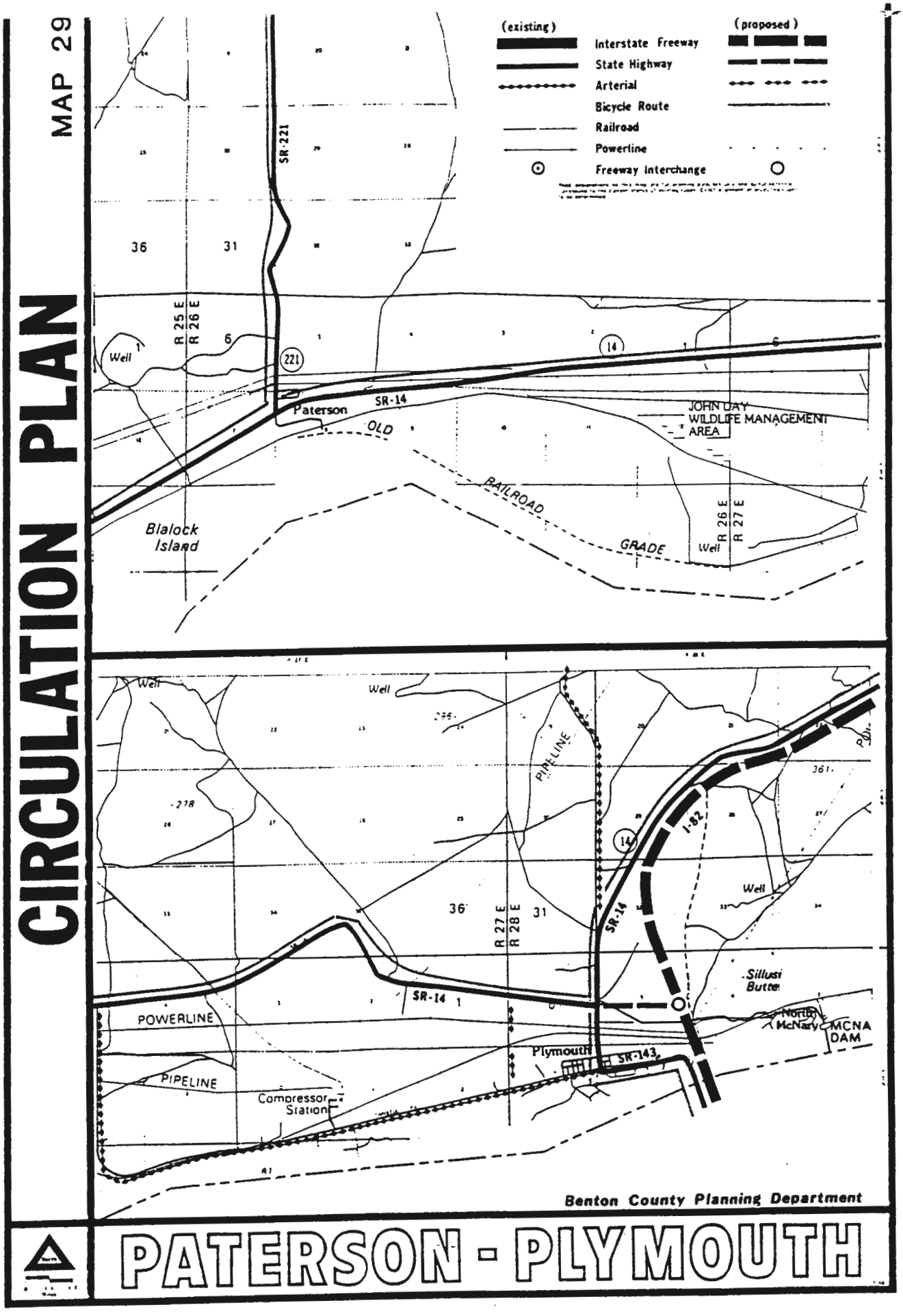
MAP 27

CIRCULATION PLAN


existing
proposed
Interstate Freeway
State Highway
Arterial
Bicycle Route
Railroad
Powerline
Freeway Interchange
Horn Rapids
Yakima
Twin Bridges
SR-240
SR-224
POWERLINE
SR-12
I-82
I-182
Candy Mtn
Goose Hill
Goose Gap
Badger Mtn
West Badger Lateral
Main
Canyon
Sheep
Scouten
Badger
East
Badger
Canal
BURLINGTON
JEEP TRAIL
Amon
Canyon
Well
36
31
Benton County Planning Department

RICHLAND - WEST RICHLAND




MAP 29
CIRCULATION PLAN
(existing)
(proposed)
Interstate Freeway
State Highway
Arterial
Bicycle Route
Railroad
Powerline
Freeway Interchange
SR-221
36
31
R 25 E
R 26 E
6
Well
221
14
Paterson
SR-14
OLD
JOHN DAY
WILDLIFE MANAGEMENT
AREA
RAILROAD
GRADE
Blalock
Island
R 26 E
R 27 E
Well
Well
Well
PIPELINE
I-82
14
36
31
R 27 E
R 28 E
SR-14
Well
Sillusi
Butte
POWERLINE
SR-14
North
McNary
MCNA
DAM
Plymouth
SR-143
PIPELINE
Compressor
Station
Benton County Planning Department
PATERSON - PLYMOUTH

CHAPTER IX

HOUSING ELEMENT

EXISTING HOUSING STOCK

As high as Benton County's population growth rate was from 1970 to 1980 (62%), the number of total units in the County's housing stock increased at a substantially greater rate (95%). Benton County in fact experienced the second highest percentage increase in housing units of all 39 counties in Washington and had a substantially higher housing growth rate than that of the State as a whole (38%).

This phenomenon to a certain extent corresponds with the nationwide trend toward decreasing household size. The average household size in Benton County in 1970 was 3.27 persons per household while the preliminary counts from the 1980 census indicated an average household size of 2.80 persons. This decreasing average household size, which is largely a reflection of smaller size families, is expected to continue throughout the long-range planning period.

As is shown by Tables 28 and 29, the increase in housing units during the past 10 years has been substantial in all jurisdictions of the County and has been dramatic in several instances. By far the most significant increase has been experienced by the City of Kennewick which added close to 10,000 new dwelling units to its housing stock over the 10 year period for an increase of 182 percent. The City of West Richland experienced the highest percentage increase of all jurisdictions in the County with 850 units being added for an increase of 203 percent.

TABLE 28: TOTAL HOUSING UNITS 1970-1980

JURISDICTION	TOTAL UNITS 1970	1980
Benton County (Total)	21,826	42,651
City of Kennewick	5,132	14,456
City of Richland	8,554	13,387
City of Prosser	1,071	1,500
City of West Richland	418	1,268
City of Benton City	369	803
TOTAL UNITS, INCORPORATED AREA	15,544(71%)	31,414(74%)
TOTAL UNITS, UNINCORPORATED AREA	6,282(29%)	11,237(26%)

Source: U.S. Bureau of the Census, 1980

TABLE 29: HOUSING UNITS ADDED 1970-1980

JURISDICTION	UNITS ADDED	PERCENT CHANGE
Benton County (Total)	20,825	95
City of Kennewick	9,324	182
City of Richland	4,833	57
City of West Richland	850	203
City of Benton City	434	118
City of Prosser	429	40
TOTAL, INCORPORATED AREA	15,870	102
TOTAL, UNINCORPORATED AREA	4,955	79

Source: U.S. Bureau of the Census, 1980

As is shown in Table 28, the relative share of housing units provided by incorporated areas (cities) in the County has increased slightly over that of the unincorporated area. Approximately three quarters of the County's existing housing stock is located within the corporate limits of the County's five cities.

OWNER VERSUS RENTER UNITS

The 1970 Census tabulations indicated that 67 percent of Benton County's housing stock was owner occupied and 27 percent was renter occupied, with the remainder (6 percent) being vacant. With the seemingly relentless increase in housing costs all indications are that the demand for rental units will remain strong. This has been born out of a HUD study of the Tri-Cities area in 1979 that estimated a mix of 64 percent owner occupied and 33 percent renter occupied for that area.

VACANCY RATES

U.S. Census Bureau figures indicate a vacancy rate for Benton County's housing stock of approximately 6 percent in 1970 and 9.6 percent in 1980. A rule of thumb used to evaluate vacancy rates is that a healthy housing market will have a vacancy rate of 1.75 to 2.0 percent for single family dwelling units and 5.0 to 6.5 percent for multiple family dwelling units. A vacancy rate significantly below the above figures could be an indication that the housing stock is underbuilt and may contribute to inflated housing costs. A vacancy rate significantly greater than the above figures could indicate that the housing stock is overbuilt.

The Census Bureau's preliminary estimate of Benton County's vacancy rate as of April 1, 1980 (9.6%) is higher than the range generally accepted as an indicator of a healthy housing market. This coincides with and could very well be a function of the softening of the local and national economies that occurred at that time.

HOUSING TYPE

As is shown on Table 30, the housing stock found within Benton County's five cities shows a mix of approximately 59 percent single family dwellings, 33 percent duplexes and apartments, and 9 percent manufactured (mobile) homes according to a report issued by the Office of Financial Management in 1980.

This can be compared with the autumn, 1980 issue of the Tri-Cities Real Estate Research Report which reported a housing mix in the Tri-Cities of 62 percent single family dwellings, 26 percent multiple family dwelling units, and 12 percent manufactured (mobile) homes. In light of ever increasing housing costs it is anticipated that apartments and manufactured (mobile) homes will continue to increase their share of the housing supply over the long-range planning period both locally and nationwide.

TABLE 30: ESTIMATED HOUSING MIX, CITIES IN BENTON COUNTY, 1980

JURISDICTION	SINGLE FAMILY DWELLINGS	MULTI-FAMILY DWELLING UNITS	MANUFACTURED HOMES	TOTAL
Kennewick	7,159	4,800	1,365	13,324
Richland	8,049	4,417	574	13,040
Prosser	1,130	338	40	1,508
West Richland	866	238	297	1,401
Benton City	444	69	292	805
TOTAL	17,648 (58.7%)	9,862 (32.8%)	2,568(8.5%)	30,078(100%)

Source: Washington Office of Financial Management, State of Washington Population Trends, 1980.

MANUFACTURED HOUSING

For approximately the past 10 years, largely as a result of the sharply increased cost of housing, there has been tremendous growth in the popularity of manufactured (mobile) homes as a means by which people choose to meet their housing needs. As stated in the Practice of Local Government Planning (ICMA, 1979), "Mobile homes have become a major source of new housing for lower and middle income families. With the rise in costs of single family homes, they represent the only resource for many families."

TABLE 31: ESTIMATED HOUSING MIX BY PERCENT, TRI-CITIES, WASHINGTON (RICHLAND, KENNEWICK, PASCO) 1975-1980

YEAR	SINGLE-FAMILY RESIDENCES	APARTMENT UNITS	MANUFACTURED HOMES
1975	81%	11%	7%
1976	77%	15%	8%
1977	66%	24%	10%
1978	64%	25%	11%
1979	62%	27%	11%
1980	62%	26%	12%

Source: Tri-Cities Real Estate Research Report, Autumn, 1980.

Figures for Benton County and the State of Washington as a whole reflect this trend. According to Benton County Assessor's Office tabulations, the County had approximately 4,000 manufactured (mobile) homes as of April 1, 1980 when the Census was taken. This would represent 9.4 percent of the total number of housing units (42,651) found in Benton County at that time. As an example of the strength of this trend, the autumn, 1980 issue of the Tri-Cities Real Estate Research Report found that for the latest period for which it had figures (January-August, 1980), manufactured (mobile) homes represented 32 percent of all new utility hook-ups in the City of Kennewick.

Providing a statewide context to these figures, a report entitled Manufactured Housing in Washington State published by the Washington Manufactured Housing Association stated that "Manufactured housing represents 25 percent of all new single-family residences being built in the State of Washington today and over 80 percent of all homes being built to sell for less than $45,000. About 10 percent of Washington State residents live in manufactured homes." Clearly, manufactured (mobile) homes are an increasingly important element of the housing stock.

This dramatic increase in the demand for and construction of manufactured (mobile) homes has presented something of a problem for local governments that were more familiar with "stick-built" housing. Adding to the problem has been the resistance on the part of many owners of single family homes to the placement of manufactured (mobile) homes within or adjacent to their subdivisions or neighborhoods. For the most park the situation that has evolved is that cities provide for manufactured (mobile) homes in separate manufactured (mobile) home parks and subdivisions, while counties have allowed mobile homes on "rural residential" acreage homesites.

There appears to be no end in sight to the high cost of housing, and as long as that is the case, it can be expected that people with moderate means will continue to turn to the manufactured (mobile) home as a housing source. The task before cities and counties,which exercise local land use plans and regulations, is to provide for this type of housing while avoiding conflicts with surrounding uses.

HOUSING CONDITION

Any discussion of the condition of an area's housing stock is especially difficult because there are as many different standards for what constitutes standard versus substandard housing as there are observers. This fact has been recognized by the U.S. Bureau of the Census which has all but abandoned attempting to quantify such housing characteristics beyond identifying units with inadequate heating or plumbing. Even in cases where cities have attempted to conduct their own internal housing condition surveys with specific detailed criteria, it was found that different individuals surveying the same housing areas and using identical specific criteria would come up with significantly differing findings as to the number of substandard units.

Notwithstanding the above, an awareness of the existence of housing units in the County's housing stock that are in some ways in substandard condition is the first step if programs for improving the County's housing stock are to be pursued at a later time. In 1979 the Benton-Franklin Governmental Conference (BFGC) conducted a housing analysis that found that 6 percent of Benton County's owner-occupied housing units, 8.5 percent of the County's renter-occupied units, and 10.5 percent of the County's vacant units could be considered substandard. The criteria used by BFGC to determine substandard condition was whether a unit required "minor or major repairs and renovations in order to comply with the Uniform Building Code". The total figure amounted to 7 percent of the County's housing stock. By way of a rough comparison, the 1960 Census placed 18 percent of the total U.S. housing stock in a similar category.

In general, the condition of the County's housing stock appears to be fairly good, probably as a result of the large percentage of the County's housing stock that is relatively new, much of the County's growth and development having occurred since World War II.

HOUSING ASSISTANCE NEEDS AND PROGRAMS

Housing assistance needs of low to moderate income families in Benton County are directly related to the housing market and cost factors discussed in the next section. With the average cost of a new home in the State of Washington currently pegged at $80,600 by the State Planning and Community Affairs Agency, low income families have an especially difficult time in meeting even the most basic housing needs.

The State Office of Community Development (now the Planning and Community Affairs Agency) published a report entitled Housing Policy in Washington State in 1979 that deals with these issues. The statistics in this document have been rapidly outdated due to recent inflationary trends (especially in regard to housing costs), but some of the fundamental findings of the study are enlightening in regard to these issues and are presented below:

> "For those families with incomes below $11,000 per year, there are few available options. In most cases these people must seek shelter in rental housing. Indeed, lower income families must acquire shelter by paying a greater portion of their income than is the case with middle- and upper-income households.
>
> . . . families with incomes below $9,000 per year are generally incapable of securing owner-occupied housing in any form unless they already own their own home or unless they pay excessive costs. This group represents one-third of the State's population."

Inclusion of a listing and description of the "alphabet soup" of federal and state housing assistance programs (HUD Section 8, FmHa Section 502, etc.) will be avoided in this Comprehensive Plan as they are easily found in background documents. The major consideration in regard to this particular housing problem is the importance of a cooperative relationship among the County, the other local governments in the area, and the State and Federal agencies that administer these assistance programs for low to moderate income families.

HOUSING COSTS

Benton County is no exception to the nationwide trend of dramatically rising housing costs. As mentioned earlier, the average cost of a new single family dwelling in the State of Washington is $80,600. The Washington Manufactured Housing Association estimates that "the soaring costs of site-built homes precludes some 85% of prospective first-time home buyers from the housing market . . ." Estimates of this type vary, but it is safe to say that based upon an average new single family dwelling cost of $80,600, approximately 75 to 80 percent of Washington households could not afford to buy a new single-family house. Clearly an increasing number of Washingtonians are finding that the "American Dream" of owning a single-family home is eluding them.

The Tri-Cities Real Estate Research Report mentioned earlier found that the local area is experiencing many of the same housing costs factors that are being felt nationwide. The report made the following conclusions regarding costs:

> "Construction costs, including lot costs, softened slightly during 1980. Recent data as reported by the Tri-Cities Real Estate Research Committee indicated that, on the average, a typical new single-family dwelling costs $79,000 in Richland, $70,600 in Pasco, and $70,100 in Kennewick. Of this total, approximately 25 percent is atributable to "lot cost" in Richland and 19 percent in Pasco and Kennewick. Financing and sales costs constitute 17 percent of the total cost.
>
> While such figures are alarming, it should be recognized that they are not atypical of the United States in general. For instance, recent figures show that the average home in the United States is currently priced at $83,400. Given that such a figure is calculated over some communities that have experienced relatively slow growth, it is easy to understand why prices might be escalating rapidly in an expanding area like the Tri-Cities. Thus, it would not seem that house prices locally are out-of-line with the national experience."

Table 32, also extracted from the real estate report, presents housing costs trends in the Tri-Cities area for the years 1974-1980.

Clearly, the people of Benton County are facing the problem of rapidly rising housing costs along with the rest of the nation. Most of the factors involved in this nationwide trend are beyond the scope of a local county government to deal with, as is evidenced by situations in

which local governments have had moritoria on any new housing or development regulations, only to see the community's housing costs skyrocket along with the rest of the nation.

There are primarily two factors relative to housing costs over which the County has some control.

1. Land availability, and
2. Land development and building regulations.

By maintaining a sufficient amount of vacant land zoned for residential uses, the cities and County can ensure that the supply of land for housing is not artificially constrained. In general, cities provide for urban density residential uses and the County provides for rural density residential uses.

County regulation of land development and housing construction has two major effects: (1) it protects the public health, safety, and welfare, and in general enhances the County's livability; and (2) it results in additional housing costs. The difficult task before the County in this regard is to strike a balance between maximizing the health, safety, welfare, and general livability of the County, while minimizing increased housing costs. To this end the County should (1) along with the cities attempt to keep an adequate amount of vacant land zoned for residential uses so as not to artificially constrict the supply of land available for housing, recognizing that the major responsibility for providing urban density residential uses falls upon the cities, (2) should allow for the use of a variety of new and innovative land development and building techniques, and (3) should maintain a system of land development and building regulations that is as reasonable, straight forward, and streamlined as possible so as to minimize additional housing costs while at the same time maintaining the County's livability.

LONG-RANGE NEEDS

The following calculations have been designed to give an indication of the long-range housing needs of the County. The calculations used to estimate the number of housing units that will be needed by the County by the year 2000 have been based upon a variety of factors. The primary factor is the year 2000 population projection of 162,245. Other factors taken into consideration have been estimated household size, demolition rates, and vacancy rates. The following discussion presents the calculations utilized to estimate the number of housing units that will be needed by the County over the long-range planning period (20 years).

1. Total Units Needed

The year 2000 population projection is for 162,245 people. Discussions with the Bonneville Power Administration (BPA) revealed detailed statistical analyses had been conducted by that agency to determine projected average household sizes by county in Washington State. BPA's projected average household size for Benton County for the year 2000 was 2.50 people per household. This projection lies within the parameters of other less specific projection and has therefore been chosen as the projected year 2000 average household size for purpose of these calculations.

By dividing the projected population by the projected average household size, it can be anticipated that approximately 64,898 total housing units will be needed to house the County's year 2000 population.

Based upon the available data, the current housing mix, by type, in the County is estimated to be approximately as follows:

A. Single Family Houses 60%
B. Multiple Family Units. 30%
C. Manufactured (mobile) Homes. . . . 10%

Recent trends indicate continuing strong demand for manufactured (mobile) homes and multiple family units as opposed to single family houses due primarily to cost factors. In light of these trends the County's projected housing mix has been adjusted and is shown below:

A. Single Family Houses 45%
B. Multiple Family Units. 30%
C. Manufactued (mobile) Homes 25%

Applying the above ratios to the estimated total need of 64,898 units, the following numbers of total units needed evolve:

TABLE 32: CONSTRUCTION COSTS OF "TYPICAL" SINGLE FAMILY DWELLING
(Benton-Franklin SMSA)

AREA/ YEAR	LOT COST	COST OF STRUCTURE[a]	FINANCING AND SALES COST[b]	TOTAL COST
Richland				
1974	7,500	31,350	5,350	44,200
1975	9,600	32,830	6,170	48,600
1976	13,700	37,870	7,630	59,200
1977	17,000	41,510	8,890	67,400
1978	19,000	44,850	10,050	73,900
1979[c]	19,500	47,520	11,180	78,200
1979[d]	19,700	47,520	11,780	79,000
1980[c]	19,900	46,600	13,450	79,950
1980[d]	19,500	47,360	12,140	79,000
Kennewick				
1974	5,300	29,700	4,880	40,380
1975	7,000	31,080	5,530	43,610
1976	9,000	35,470	6,580	51.050
1977	11,100	39,010	7,610	57,720
1978	12,500	42,350	8,630	63,480
1979[c]	13,000	44,870	9,650	67,520
1979[d]	13,200	45,950	10,150	69,300
1980[c]	13,400	45,000	11,900	70,300
1980[d]	13,200	46,400	10,500	70,100
Pasco				
1974	5,400	29,400	4,790	39,590
1975	6,600	30,270	5,360	42,230
1976	8,200	35,120	6,410	49,730
1977	10,100	38,620	7,400	56,120
1978	12,000	41,930	8,490	62,420
1979[c]	12,500	44,420	9,490	62,410
1979[d]	13,000	46,150	10,150	69,300
1980[c]	13,300	45,100	11,900	70,300
1980[d]	13,300	46,800	10,500	70,600

[a]Structure costs for a "Typical" 1,500 square foot single-family dwelling including overhead and profit.
[b]Costs would include: broker's commission, interest on construction loan, loan fees, and closing costs.
[c]March
[d]September

Source: Tri-Cities Real Estate Research Report, Autumn, 1980.

A.	Single Family Houses	29,204 units
B.	Multiple Family Units.	19,469 units
C.	Manufactured (mobile) Homes. . . .	16,225 units
	TOTAL	64,898 units

Based upon these figures, calculations can be made in order to provide for a vacancy rate of 1.90 percent for single family houses and manufactured (mobile) homes and 5.80 percent for multiple-family units. When the calculations are made, the resulting figures indicate the total number of housing units that will be needed by the year 2000 in order to provide for the long-range housing needs of the people of Benton County, and are shown below:

A.	Single Family Houses	29,759 units
B.	Multiple Family Units.	20,598 units
C.	Manufactued (mobile) Homes	16,533 units
	TOTAL UNITS NEEDED.	66,890 units

2. Total Units Needed in Addition to Existing Housing Stock:

The above calculations indicate a total estimated need of 66,890 housing units in order to house Benton County's Year 2000 projected population. The County's current housing stock (1980) consists of 42,651 units. Utilizing the rule-of-thumb of annual loss of one percent of the existing housing stock, over the 20 year planning period it can be anticipated that approximately 8,500 units will be lost to demolition or conversion. Based upon these criteria, the following estimates evolve.

1.	Total Units Needed	66,890 units
2.	Minus Existing Stock	-42,651 units
3.	Plus Number of Units that can be expected to be lost over the 20 year planning period.	+8,500 units
4.	Equals Total New Units that will have to be added by the Year 2000. . . .	=32,739 units

Utilizing the projected housing mix of 45 percent single family homes, 30 percent multiple family units, and 25 percent manufactured (mobile) homes, the following totals of new units, by type, would be needed.

A.	Single Family Houses	14,732 units
B.	Multiple Family Units.	9,822 units
C.	Manufactured (mobile) Homes	8,185 units
	TOTAL UNITS NEEDED TO BE ADDED . .	32,740 units

CONCLUSION

This Housing Element has examined the available information regarding the housing situation in Benton County and has attempted to identify the County's long-range housing needs. Part of the answer to the question of how these housing needs will be met is found in the Comprehensive Plan maps which identify in a general way locations, densities, and servicing of residential areas over the long-range planning period. In addition, the goals and policies dealing with housing and residential land use further identify how these needs will be met in that they establish official County policy for dealing with housing problems and opportunities.

CHAPTER X

ECONOMIC ELEMENT

INTRODUCTION

An understanding of the County's economic foundation is an important part of the planning process. It is often difficult to appreciate the cumulative, long-range impacts of incremental, day-to-day land use decisions upon the County's economic base. This element of the Comprehensive Plan presents an analysis of the major segments of the County's economy so that these impacts can be better understood and incorporated into the County's planning process.

OVERVIEW

By almost any standard, Benton County has a unique economy. Up until the time of the atomic development project which took place at Hanford during World War II, the County's economy had been almost entirely based upon agriculture and related activities. Since that time, the continued development and expansion of the nuclear energy and related activities has been largely responsible for the phenomenal growth of the County's economy and population that has taken place. As an illustration of how dramatic this growth has been it can be noted that in 1940, just prior to the atomic energy project, total County population was 12,053 and Prosser and Kennewick were the two largest cities in the County with approximately 2,000 people apiece. From that rural type of economy and population, the County has leaped to a population of 109,444 in 1980, ranking as the ninth most populous county in the State.

Most studies agree that the rapid and substantial growth that has been experienced by the County has been largely a result of the growth of the nuclear energy industry and related economic activities, and that this industry is now the largest element of the County's economy. This is not to imply that the agricultural element of the County's economy has stood still during this time period. To the contrary, there has been substantial growth in the production, processing, and distribution of agricultural products in Benton County. Of special significance has been the development and expansion of irrigation projects and systems such as center-pivot (circle) irrigation technology. As an example of the increase in agricultural activity it can be noted that from 1962 to 1979, 135,142 additional acres of land in the County were brought under irrigation.

The result of these developments is that at the present time, Benton County's economy is primarily based upon two major elements - nuclear power and related activities, and agriculture and related activities. The following sections of this Element give a more detailed analysis of this economic structure.

NUCLEAR ENERGY AND RELATED ACTIVITIES*

Historical Background

Prior to 1943, there was no nuclear energy activity in Benton County. In January of that year the Hanford Site was chosen for the construction of facilities for the production of plutonium for nuclear weapons. By the end of World War II, E. I. duPont de Nemours & Company, the general contractor, had constructed three nuclear reactors, three chemical processing plants for recovering plutonium, 64 underground waste storage tanks, fuel fabrication facilities, and 4,300 homes in Richland.

In 1946 the General Electric Company became the operating contractor for Hanford. During the years 1947-1956 G.E. built five additional plutonium production reactors, two chemical processing plants, and 81 additional underground waste storage tanks. During this time, 2,000 homes were added to Richland. Between 1959 and 1963, N Reactor was built with both plutonium production and power generation capacities. In 1966 the Washington Public Power Supply System (WPPSS) built an 860 megawatt power generating facility adjacent to N Reactor in initiate power production at Hanford.

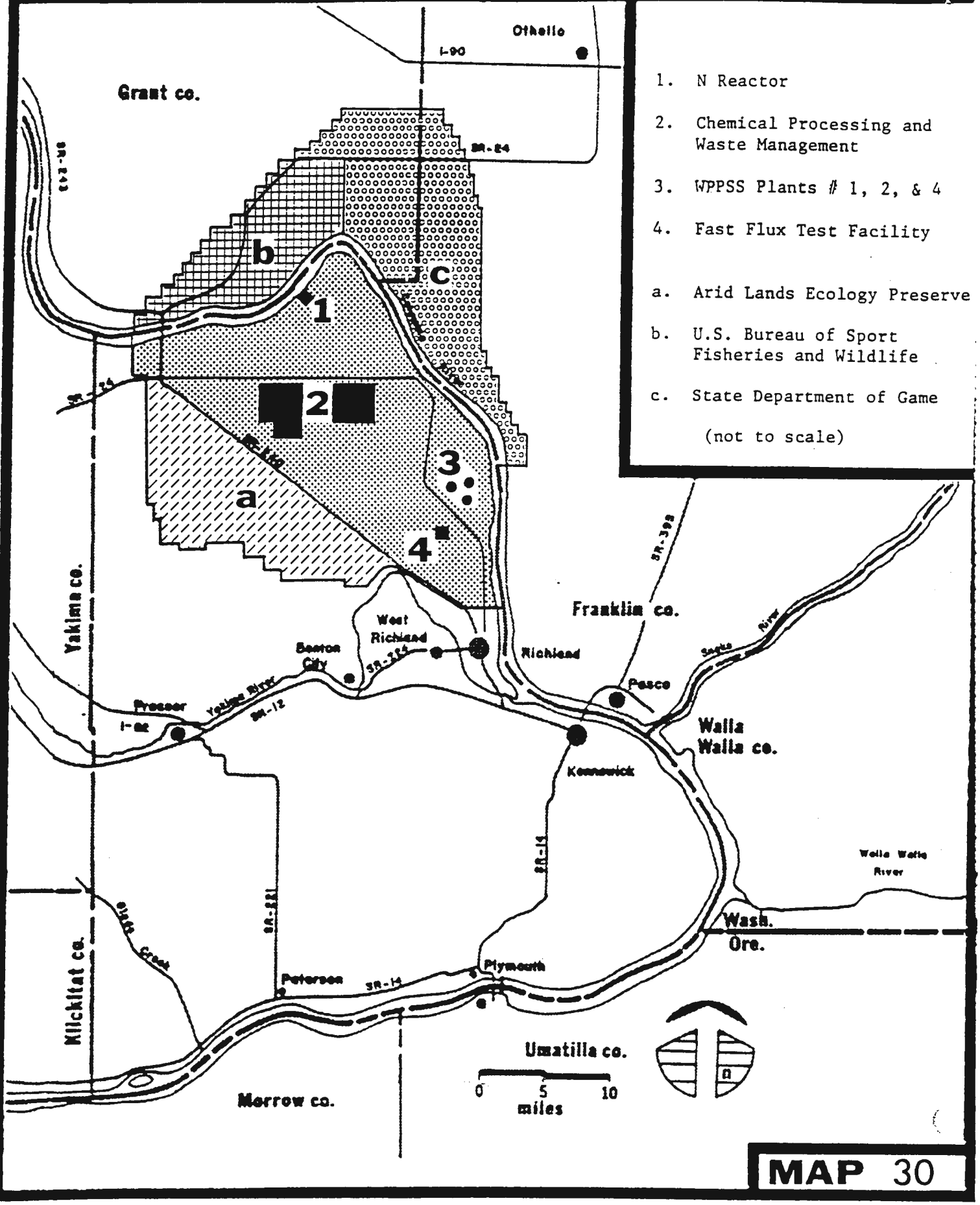
Diversification

Beginning in 1964, Hanford went through a number of significant changes. During the period 1965-1971 eight of the nine plutonium production reactors were shut down, leaving N Reactor as the only operating production reactor. During the mid-1960's the operation of Hanford was reorganized. Rather than having one overall operating contractor, Hanford operations were divided into separate programs such as reactors, laboratories, chemical processing, and support services. Contractors were selected for these areas, one of the criteria for selection being

*Much of the material presented in this section has been extracted from information provided by the U.S. Department of Energy.

Benton County Comprehensive Plan

Hanford Site



1. N Reactor
2. Chemical Processing and Waste Management
3. WPPSS Plants # 1, 2, & 4
4. Fast Flux Test Facility

a. Arid Lands Ecology Preserve

b. U.S. Bureau of Sport Fisheries and Wildlife

c. State Department of Game

(not to scale)

MAP 30

the extent to which the contracting firm would diversify into the economic development of the Tri-Cities area.

By most accounts this diversification strategy was successful in softening the impact on the area's economy resulting from the shutdown of all but one of the Hanford reactors. According to the U.S. Department of Energy, some of the new businesses and industries that have emerged from this diversification program include Battelle Northwest Laboratories, the Exxon Nuclear Research and Technology Center, the Hanford House Hotel, a meat packing plant, Sandvik Special Metals, a cattle feed lot, and a bioassay laboratory.

In 1967 the Hanford Site was chosen as the location for the Fast Flux Test Facility (FFTF). This test reactor is designed to test fuels and materials that would be utilized by "breeder" reactors which when developed would produce more fuel then they consume. The FFTF began operation in 1980, after having been constructed at a cost of $647 million.

WPPSS Power Projects

The most recent development at the Hanford Site has been that of commercial nuclear power plants. Construction is currently underway on three such plants by the Washington Public Power Supply System (WPPSS). Plants Nos. 1, 2, and 4 are approximately 45 percent, 85 percent, and 21 percent complete respectively. In addition, a consortium of utilities headed by Puget Sound Power and Light has requested permission from the U.S. Department of Energy to locate two nuclear power plants at Hanford. Site exploration activities are currently taking place for this proposal under the auspices of the Energy Facility Site Evaluation Council.

Employment Impact

In 1980 U.S. Department of Energy activities at the Hanford Site employed 12,571 people and WPPSS activities employed a peak number of 8,091 for a total Hanford employment figure of 20,662. Preliminary figures by the Washington Employment Security Department indicate that 1980 total nonfarm wage and salary employment in the Benton-Franklin, two-county area peaked at 62,810 in May of that year. This means that Hanford employment constituted 33 percent or one-third of total nonfarm wage and salary employment in the two-county area

The significance of the Hanford nuclear activities to Benton County's economy can also be demonstrated by examining payroll figures. In 1979, total wages paid in Benton County according to Washington Employment Security Department figures amounted to $809,651,815. Total payroll that year at Hanford for both DOE and WPPSS projects totalled $476,000,000 according to a February 22, 1981 article in the Tri-City Herald, indicating that Hanford accounts directly for nearly 60 percent of the total wages and salaries paid in Benton County.

Clearly, the impact of the Hanford nuclear energy activities on the County's economy is little short of overwhelming. Two additional factors should be mentioned in order to complete the description of this segment of the County's economy. The first is that all of the previous figures relate only to direct employment by Hanford industries-they do not take into account the multiplier effect that would result upon consideration of the indirect employment generated by these industries. For example, a recent Draft Environmental Impact Statement prepared by CH$_2$M Hill for an ethyl alcohol facility in the County estimated that 84 percent of the employment in the service industry in the two-county region is related to Hanford as is 95 percent of the employment in the chemical industries in the area.

The other factor to be considered is the extent to which employment and payroll figures for Hanford are composed of construction employment that is subject to fluctuation. Of the total 1980 Hanford employment figure of 20,662, approximately 6,050 jobs (29%) were described as constituting the WPPSS craft work force. Although it is recognized that construction employment is subject to fluctuation, it is very difficult to predict with any degree of accuracy the extend to which such fluctuation will be affected by increased need for an operational work force upon completion of construction or by future needs for a construction work force due to new construction. Regardless of these factors however, the significance of the Hanford nuclear industries to Benton County's economy is self-evident.

AGRICULTURE

Land

Agriculture is the second pillar upon which the foundation of the County's economy rests. Benton County's total land area is 1,095,910 acres. In 1980 according to estimates prepared by the Benton County Extension Service, approximately 743,860 acres or 68 percent of the County total was devoted to agricultural production. Table 33 indicates the three major categories into which these agricultural lands can be divided. Map 31 portrays graphically the general

location of these agricultural lands categories, based upon a U.S. Soil Conservation Service survey that categorized land use by section based upon dominant (70 percent or greater) use in each section.

TABLE 33: AGRICULTURAL LAND IN BENTON COUNTY - 1980

AGRICULTURAL USE	ACRES	PERCENT
Dry Cropland	346,000	47%
Dry Rangeland	238,860	32
Irrigated Cropland	159,000	21
TOTAL	743,860	100

Source: Benton County Extension Service

The dry cropland indicated in the table is evenly split between being planted in wheat and being in summer fallow. The rangeland is used primarily for cattle grazing. The irrigated cropland, while constituting only 21 percent of the County's total agricultural land, accounts for approximately 85 percent of the County's total agricultural production value according to Soil Conservation Service figures. Table 34 indicates the extent to which a wide variety of crops are grown on irrigated lands in the County.

Prime Farmlands

In 1977, the U.S. Soil Conservation Service (SCS) completed a study which identified the relative importance of the County's farmlands. Using a variety of criteria, including soil capability classifications as well as current farming practices, the County's important farmland was divided into three categories: (1) prime farmland, (2) unique farmland, other than prime, and (3) additional farmland of statewide importance. The results of the study are graphically portrayed on Map 32.

Prime farmland is the best land for farming. It generally consists of agricultural capability Class I or II soils, is flat or gently rolling, and susceptible to little or no erosion. Prime acres are the most energy efficient, producing the most crops with the least amount of fuel, fertilizer, and labor. Their soil quality, growing season, and moisture supply assure continuous, high productivity without harm to the soil.

As shown on map 32, the bulk of the County's prime agricultural land is found in two general areas:

1. The area north of Prosser which is an extension of the fertile Yakima Valley, and
2. Lands in the southern Horse Heaven Hills area that are coming under irrigation.

It should be noted that the amount of farmland in the southern Horse Heaven Hills area that is under irrigation has increased since the data for this map was compiled in 1975. This has most likely resulted in an increase in acreage in that area of land that would meet either the prime or unique agricultural land criteria. Soil Conservation Service estimates for the County as a whole placed a total of 52,919 acres in the prime farmland category as of 1976.

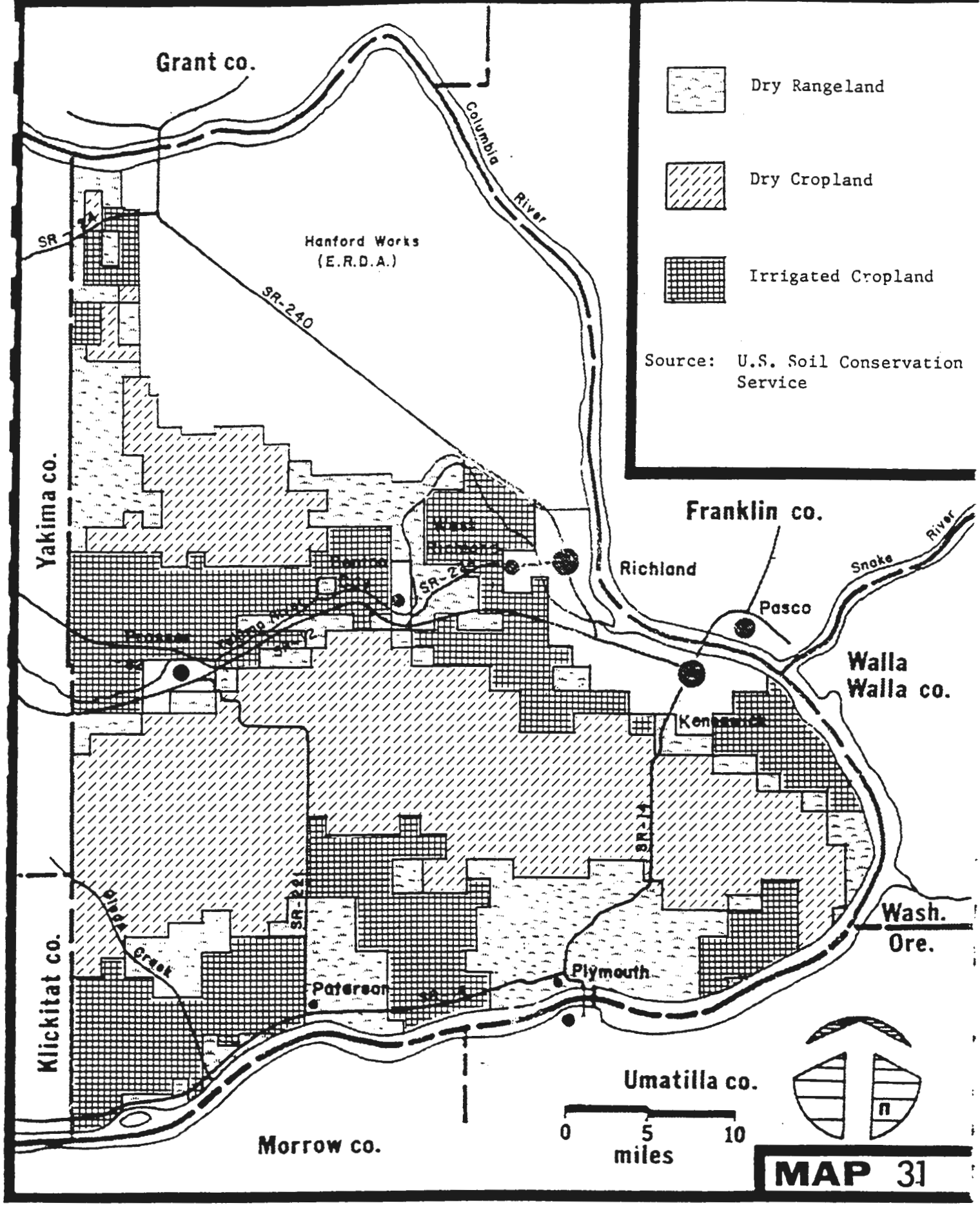
The second category of important farmlands is that of "unique farmland other than prime." This category consists of land other than prime farmlands that is used for the production of specific high-value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to produce sustained high quality and/or high yields of a specific crop. Areas of "unique" farmland in Benton County are primarily found in scattered acreages north of the Yakima River from the Yakima County line to Benton City. Soil Conservation Service estimates placed 23,557 acres in this category as of 1976.

The last category of important farmlands utilized by SCS is "additional farmland of statewide importance." Land in this category is farmland of statewide importance in addition to prime and unique farmlands and is available for crop production. It must meet the following criteria.

1. Agricultural capability Class IV or better, or

Benton County Comprehensive Plan

Generalized Agricultural Lands



MAP 31

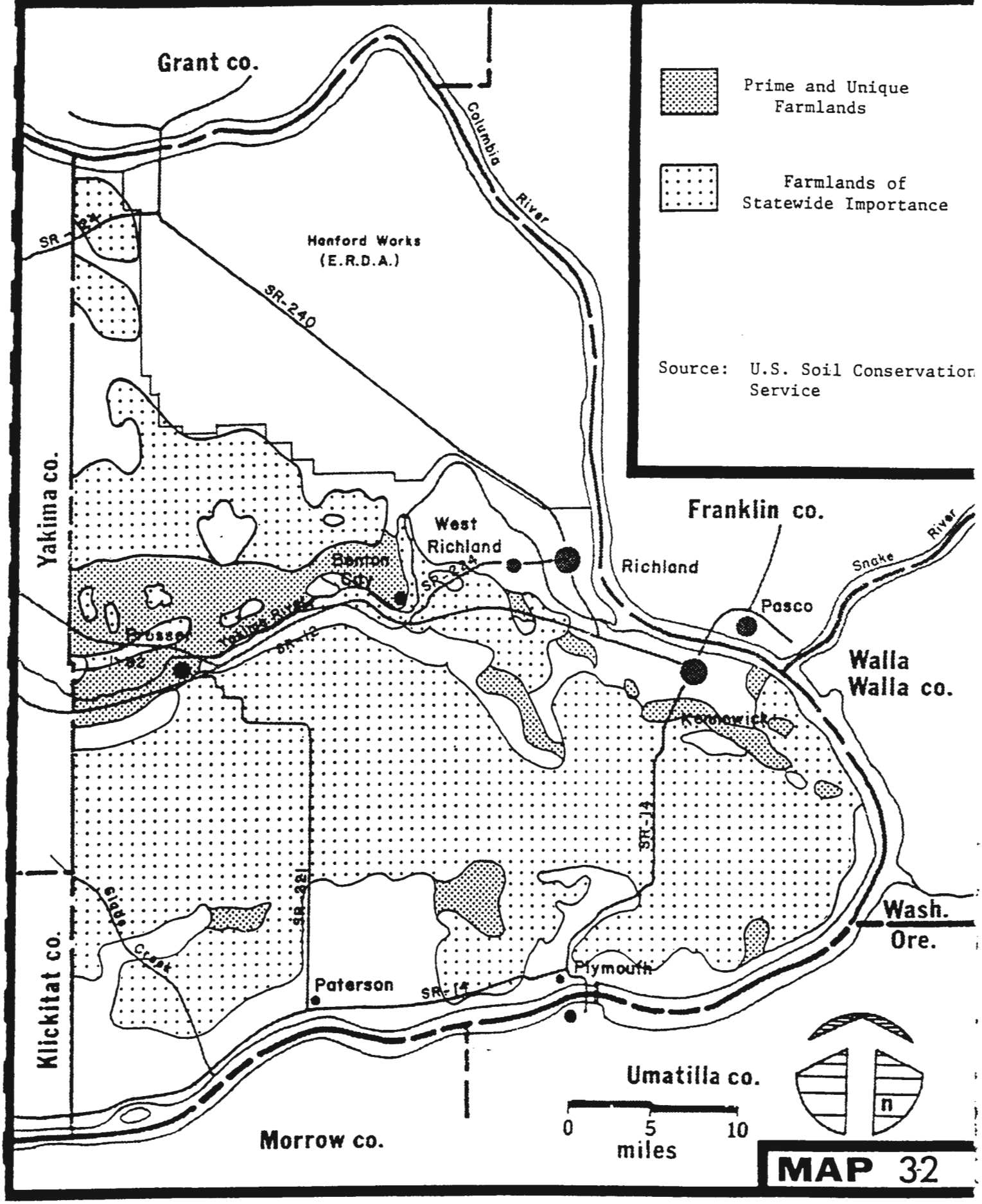
TABLE 34: BENTON COUNTY IRRIGATED CROPLAND, 1984

	CROP	ACRES	PERCENT OF TOTAL ACREAGE
1.	Field Corn	40,349	25
2.	Potatoes	19,750	12
3.	Irrigated Pasture	19,600	12
4.	Alfalfa Hay	17,600	10
5.	Green Manure (not farmed)	9,211	6
6.	Wheat	8,765	5
7.	Apples	8,675	5
8.	Concord Grapes	6,950	4
9.	Wine Grapes	5,650	3
10.	Hops	5,022	3
11.	Barley	3,295	2
12.	Cherries	3,225	2
13.	Misc. Bulbs, Berries Vegetables & Turf	3,000	2
14.	Peppermint and Spearmint	2,250	1
15.	Asparagus	2,200	1
16.	Sweet Corn	2,011	1
17.	Dry Beans	802	Less than 1%
18.	Prunes	580	Less than 1%
19.	Corn Silage	578	Less than 1%
20.	Peaches	550	Less than 1%
21.	Turnips	460	Less than 1%
22.	Pears	330	Less than 1%
23.	Apricots	220	Less than 1%
24.	Onions	166	Less than 1%
25.	Jerusalem Artichokes	150	Less than 1%
26.	Carrots	126	Less than 1%
27.	Oats	120	Less than 1%
28.	Nectarines	115	Less than 1%
29.	Grass Seed	50	Less than 1%
30.	Alfalfa Seed	50	Less than 1%
31.	Red Clover Seed	30	Less than 1%
	TOTAL	161,880	

Source: Benton County Extension Service

Benton County Comprehensive Plan

Important Farmlands



Prime and Unique Farmlands

Farmlands of Statewide Importance

Source: U.S. Soil Conservation Service

MAP 32

2. Agricultural capbility classes less than IV, not irrigated but favorable or potentially favorable for irrigation, and included in a preliminary irrigation feasibility study.

Soil Conservation Service estimates placed 447,663 acres in this category as of 1976. As can be seen by the above analysis, some 524, 139 acres or nearly 50 percent of the County's total land area is considered to be important farmland according to SCS criteria.

Irrigation

As has been mentioned, 85 percent of the County's agricultural production value is attributed to irrigated cropland. This type of agricultural activity is made possible by the irrigation delivery systems which have been developed in the County. The general locations of irrigation districts and private irrigation developments found in the County are shown on Map 33.

For the most part, the agricultural production that currently takes place in the midsection of the County, from the Yakima County line to the Finley area, is made possible by the Yakima Project developed by the U.S. Bureau of Reclamation. The Yakima Project was developed primarily for the purpose of providing irrigation water for the fertile Yakima River Valley and consists of some 2,000 miles of canals and laterals, six storage dams, five diversion dams, two hydroelectric power plants, 70 miles of transmission lines, and 30 pumping plants. This irrigation system provides the water that enables the Yakima Valley, which extends into Benton County, to continually be one of the nation's premier producers of such crops as apples, mint, hops, cherries, etc., and to earn the title of "Fruit Basket of the World."

The other major irrigated agriculture area in the County is of more recent origin and is located along the southern portion of the Horse Heaven Hills area. As is indicated on Map 33, the irrigation delivery systems in this part of the County are primarily of a private development nature rather than irrigation districts. According to figures released by the Benton County Extension Agent, in 1980 there were approximately 71,000 irrigated acres in this area. The development of irrigated agriculture in this area over the past four years is shown by Table 35.

TABLE 35: IRRIGATED LAND - HORSE HEAVEN HILLS IN BENTON COUNTY 1977-1980

YEAR	ACREAGE
1977	62,003
1978	67,096
1979	69,903
1980	71,104

Source: Benton County Extension Agent

Figures are available for specific crop acreages for irrigated land in the Horse Heaven Hills, but only as an amalgamation of the entire Horse Heaven Hills, including that portion within Klickitat County. Since that portion within Klickitat County represents less than seven percent of the total area, however, these figures should present an accurate picture of the relative importance of the various crops grown on irrigated lands in the Horse Heaven Hills area of Benton County. Table 36 presents these figures.

Since 1976, according to County Extension Service figures, the amount of irrigated cropland in the County has increased by 26,261 acres. The figures are shown in Table 37.

As Table 37 indicates, there has been almost a 20 percent increase in the amount of irrigated agricultural land in the County during the years 1976-1980. A very clear trend that emerges from the table however, is the decreasing amount, both numerically and as a percentage, of each year's increase. The increase has dropped from almost eight percent a year to less than two percent, with the total annual acreage increase dropping from 10,525 acres in 1977 to some 2,700 acres by 1980.

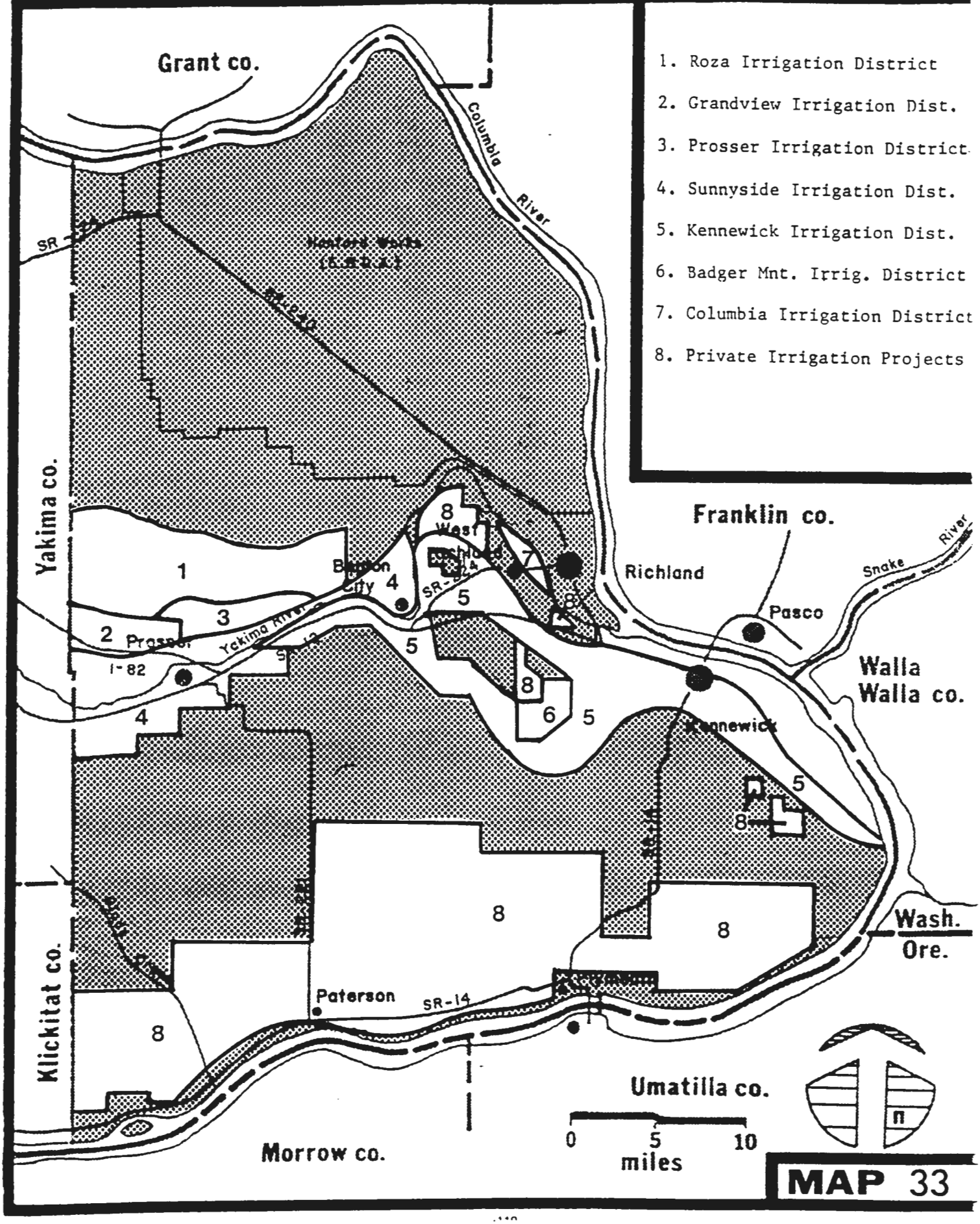
Washington State University Irrigated Agriculture Research and Extension Center (IAREC)

Washington State University's IAREC is a Unique resource for Benton County's irrigated agricultural base, as it is for the entire State. In fact, irrigated agriculture specialists throughout the world are interested in the research conducted at the IAREC.

IAREC maintains four research farms totalling 1190 acres. Two of these units, including the headquarters, are located in Benton County north of Prosser. The purpose of IAREC is to conduct "research on both practical and fundamental problems of Washington's highly diversified

Benton County Comprehensive Plan

Irrigation Districts



MAP 33

TABLE 36: CROPS GROWN ON IRRIGATED LAND IN THE HORSE HEAVEN HILL BENTON AND KLICKITAT COUNTIES, 1980

1.	Field Corn	19,347	25
2.	Wheat	18,443	24
3.	Potatoes	14,733	19
4.	Dry Beans	9,921	13
5.	Alfalfa Hay	6,493	9
6.	Wine Grapes	1,914	3
7.	Irrigated Pasture	1,253	2
8.	Barley	778	1
9.	Asparagus	625	1
10.	Sweet Corn	559	1
11.	Apples	526	1
12.	Alfalfa Seed	404	1
13.	Peppermint	380	1
14.	Peas	316	Less than 1%
15.	Oats	200	Less than 1%
16.	Onions	128	Less than 1%
17.	Cherries	60	Less than 1%
18.	Concord Grapes	19	Less than 1%
19.	Clover Seed	5	Less than 1%
	TOTAL	76,104	

Source: Benton County Extension Service

TABLE 37: IRRIGATED CROPLAND IN BENTON COUNTY, 1976-1980

YEAR	IRRIGATED CROPLAND	ACREAGE INCREASE	PERCENT INCREASE
1976	132,739 acres		
1977	143,264 acres	10,525	7.9
1978	151,911 acres	8,647	6.0
1979	156,313 acres	4,402	2.9
1980	159,000 acres	2,687	1.7
TOTAL INCREASE		26,261	19.8

Source: Benton County Extension Service

irrigated agriculture". IAREC maintains 42 scientists and 118 other workers who analyze problems in agronomy, soil science, weed science, horticulture, entomology, plant pathology, food science and technology, agricultural engineering, and animal science as they relate to irrigated agriculture.

The IAREC's work is concerned with many of the crops grown in Benton County such as asparagus, grapes, corn, hops, mint, sunflowers, pears, cherries, apples, peaches, apricots, beans, peas, alfalfa, and potatoes. Many of the findings and results of this research are applied directly to Benton County farmlands. Clearly, the Center is a unique and valuable resource for the County as well as for the entire State of Washington.

Employment and Income

Table 38 gives total farm employment figures (both proprietor and wage and salary employment) for the years 1971-1975. According to statistics presented in An Economic Assessment of Area XII prepared by the Washington Department of Commerce and Economic Development, Benton County's

agricultural industries employed some 4,500 people in 1975; including approximately 3,000 farm proprietors and wage and salary employees, approximately 1,100 food processing jobs, and "several hundred other manufacturing and service jobs in areas such as fertilizer, irrigation equipment, farm implements, and research". This would represent approximately 13 percent of the County's total employment for that year (33,762).

TABLE 38: BENTON COUNTY TOTAL FARM EMPLOYMENT
(Proprietor and Wage and Salary) 1971-1975

YEAR	FARM EMPLOYMENT	PERCENT OF TOTAL COUNTY EMPLOYMENT
1971	2,576	10
1972	2,481	10
1973	2,605	10
1974	2,976	10
1975	3,101	9

Source: Washington Department of Commerce and Economic Development

Table 39 gives total farm industry personal income (both proprietor and wage and salary) for the years 1973-1978 as well as the percentage of total County personal income. As the table shows, during the period covered, total farm industry personal income as a percentage of the County total has experienced a decline from nine percent to four percent.

TABLE 39: TOTAL FARM INDUSTRY PERSONAL INCOME
(proprietor and Wage and Salary) 1973-1978

YEAR	FARM INDUSTRY PERSONAL INCOME	PERCENT OF COUNTY TOTAL
1973	$26,486,000	9
1974	35,049,000	10
1975	33,935,000	8
1976	26,056,000	5
1977	17,681,000	3
1978	29,108,000	4

Source: U.S. Bureau of Economic Analysis

Production Values

Table 40 indicates total cash receipts from marketing of Benton County's farm products for the years 1973-1978 as reported by the U.S. Bureau of Economic Analysis. As is shown by the table, although the progression has been cyclical, total cash receipts have increased from some $80,000,000 in 1973 to nearly $105,000,000 in 1978.

Crops

Table 42 presents estimated production values for crops gown in Benton County in 1980. The estimates are based upon acreage, yield, and price figures complied by the Benton County Extension Service and the local office of the U.S. Soil Conservation Service. Apples and wheat have traditionally been the County's two highest cash crops. They have alternated their relative positions over the years, depending primarily upon price levels.

Livestock and Poultry

Current values for an area's livestock and poultry industries are very difficult to estimate. For example a significant amount of guesswork is by necessity involved in attempting to estimate the percentage of a county's beef cattle inventory that are yearlings, ready for market, etc. Nonetheless, the livestock and poultry element of the County's agriculture is significant and cannot be ignored.

TABLE 40 : BENTON COUNTY FARM INCOME FROM MARKETINGS, 1973-1978

	1973		1974		1975		1976		1977		1978	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
Cash Receipts From Crops	$65,704,000	83	$78,616,000	87	$82,225,000	88	$78,062,000	84	$70,026,000	84	$88,613,000	85
Cash Receipts from Livestock and Products	$13,862,000	17	$11,306,000	13	$11,479,000	12	$14,886,000	16	$13,510,000	16	$15,886,000	15
TOTAL	$79,566,000	100	$89,922,000	100	$93,704,000	100	$92,948,000	100	$83,536,000	100	$104,499,000	100

Source: U.S. Bureau of Economic Analysis

TABLE 42: ESTIMATED CROP VALUES, 1980

	CROP	PRODUCTION VALUE	PERCENT OF TOTAL COUNTY CROP PRODUCTION VALUE
1.	Apples	$36,720,000	18
2.	Wheat (both dryland and irrigated)	33,252,000	17
3.	Hops	25,300,000	13
4.	Cherries	23,391,000	12
5.	Potatoes	22,080,000	11
6.	Field Corn	11,648,000	6
7.	Wine Grapes	10,500,000	5
8.	Concord Grapes	9,180,000	5
9.	Alfalfa	7,880,000	4
10.	Mint	4,412,000	2
11.	Asparagus	3,916,000	2
12.	Beans	3,300,000	2
13.	Corn Silage	1,346,000	1
14.	Peaches	1,200,000	1
15.	Prunes	905,000	1
16.	Pears	849,000	Less than 1%
17.	Nectarines	720,000	Less than 1%
18.	Sweet Corn	648,000	Less than 1%
19.	Apricots	560,000	Less than 1%
20.	Onions	480,000	Less than 1%
21.	Alfalfa Seed	321,000	Less than 1%
22.	Sunflowers	279,000	Less than 1%
23.	Peas	224,000	Less than 1%
24.	Barley	135,000	Less than 1%
25.	Carrots	120,000	Less than 1%
26.	Grass Seed	99,000	Less than 1%
27.	Oats	49,000	Less than 1%
28.	Watermelon	45,000	Less than 1%
29,	Red Clover	27,000	Less than 1%
30.	Triticale	14,000	Less than 1%
	TOTAL	$199,600,000	

Source: Soil Conservation Service

The County Extension Service has made some rough estimates as to the number of livestock and poultry in the County and for purposes of this Comprehensive Plan based upon those estimates has calculated a hypothetical value utilizing an assumed herd mix and average prices. Although an estimate, Table 41 gives an indication of the value of Benton County's livestock and poultry industries in 1980.

It should be noted that based upon statistics produced by the 1974 Census of Agriculture, Benton County ranked ninth in the State for cattle and calves and seventh for sheep and lambs.

TABLE 41: BENTON COUNTY LIVESTOCK AND POULTRY: ESTIMATE NUMBER AND VALUE 1980

LIVESTOCK	HEAD OF ANIMALS	VALUE
Beef Cattle	29,100	$14,125,140
Dairy Cattle	3,050	3,050,000
Horses	3,200	1,440,000
Sheep	5,300	504,825
Hogs	4,800	308,880
Poultry	1,673	3,346
TOTAL		$19,432,191

Source: Benton County Extension Service

Overall Values

It is important to note that the importance of agriculture to the County's economy is heightened by the fact that it is a "basic" industry, meaning that the goods produced are exported out of the County, thus bringing outside dollars into the County's economy. These dollars are then spent and respent many times on the nonbasic activities in the County. This is as opposed to a "nonbasic" activity (a bookstore, for example) in which by and large internal dollars are merely being exchanged within the local economy.

Table 43 presents the top ten agricultural counties in Washington, based upon total value of all agricultural products (crop and livestock) sold in 1978 as reported by the 1978 Census of Agriculture. As shown Benton County ranked fifth, up from seventh place in 1975.

TABLE 43: TOP 10 AGRICULTURAL COUNTIES IN WASHINGTON, 1978

	COUNTY	VALUE OF PRODUCTS SOLD
1.	Yakima	$357,587,000
2.	Grant	229,075,000
3.	Walla Walla	139,866,000
4.	Whitman	122,724,000
5.	Benton	114,386,000
6.	Franklin	108,267,000
7.	Adams	94,191,000
8.	Whatcom	93,705,000
9.	Okanogan	70,635,000
10.	Chelan	70,568,000
	State Total	$2,096,510,000

Source: U.S. Department of Agriculture, Economics and Statistics Service

In order to place the importance of Benton County's agriculture in a regional perspective, it is helpful to examine some of the findings of the Umatilla County (Oregon) Draft Comprehensive Plan Technical Report (Umatilla County Planning Department, May, 1980). That document states that Umatilla County has been "consistently ranking first or second and rarely third in total (agricultural) productivity among Oregon counties." The study also found that Umatilla County's total estimated gross cash agricultural marketing receipts for 1978 amounted to $105,496,000. In light of the $114,386,000 figure attributed to Benton County marketings for that year (see Table 43), it would seem safe to assume that Benton County's agricultural production value is one of the highest of counties in Washington and Oregon. In any event, it is clear that

agriculture is one of the key elements of Benton County's economy.

Farmland protection

One of the most perplexing issues facing counties across the nation is caused by the fact that many of our prime agricultural lands are also the most attractive lands for nonfarm development. Nationally, one million acres of prime farmland (our best farmland) are being lost each year to development. According to the National Agricultural Lands Study conducted in 1980 by the U.S. Department of Agricultural and 11 other federal agencies, "The thief is urban sprawl".

Closer to home, that same study estimated that based upon the rate at which prime farmland was being lost in the State of Washington during the period 1967-1977, the State would lose 23 percent of its prime farmland within 20 years. U.S. Soil Conservation Service studies indicate that in Benton County an average of 426 acres of prime farmland was lost to residential development each year from 1976 to 1980.

The problems associated with this trend were recently examined in a study conducted by the National Association of Counties (NACo) Research Foundation. Many of the conclusions of that study were included in Disappearing Farmlands, published by the NACo Research Foundation in 1980. The following are some of the more salient conclusions of that study:

> "There is no question whatsoever that farmland loss is having a powerful effect right now, on the economy, social fabric, and quality of life in local communities all over the country.
>
> "The leading cause of farmland loss is unplanned or poorly planned suburban development, often called 'leapfrog' or 'buckshot' development because it skips over land close to town and is scattered across the countryside. This random kind of development not only takes farmland directly out of production, but also starts a chain reaction of socioeconomic events that hastens the conversion of still more agricultural land and profoundly affects everyone in the community.
>
> "Leapfrog development on farmland rarely pays its own way. As water and sewer lines are extended farther and farther into the countryside, and as roads must be upgraded and maintained to handle larger volumes of traffic, the costs of providing these community services rise accordingly. Since these costs must be paid out of local tax revenues, property tax assessments and rates almost always increase when leapfrog development occurs. Usually farmers and established residents of areas close to town bear a disproportionate share of the new tax burden, in effect, subsidizing the loss of farmland.
>
> "While the loss of open space amenities and rising taxes affect everyone in the community, it is the farmer himself who is often hardest hit by the disappearance of farmland around him. When subdivisions are built next door to active agricultural operations, land use conflicts are bound to arise and are frequently resolved against the interest of the farmer simply because his new neighbors outnumber him. And as more and more farms succumb to the pressure, the local agricultural economy beings to wither.
>
> "Agriculture is an industry which, like other industries, requires ample room to be carried on without offending its neighbors. Livestock operations produce noxious odors, cultivation raises dust and the application of agricultural chemicals can cause health problems for people living close by. Farms harbor attractive nuisances such as ponds and barbed wire fences that pose safety hazards for unwary children. Oversized farm machinery backs up traffic on narrow rural roads when it is moved from field to field. There are a thousand and one different routine farm operations that can and do give rise to complaints-and sometimes lawsuits-by unsympathetic suburban neighbors.
>
> "But complaints, whether or not they impose liability on the farmer, are only half the story. The land use conflicts that arise when subdivisions invade the countryside are not limited to those precipitated by ordinary farming practices, but include those that are caused by the suburbs themselves. Vandalism of farm equipment, pilferage of growing crops, cutting of fences ad other crimes against farm property generally increases as the country side gets more crowded. It may be that only a few rotten apples are spoiling the whole bushel, and that most suburbanites are more considerate of their farm neighbors, but the incidents of crime against farmers are nonetheless a fact of life that seems to accompany development of the countryside. These crimes cost the farmer in both dollars and time spent repairing the damage, not to mention aggravation and despair.
>
> "More and more farmers are feeling the pinch caused by leapfrog development and the land use conflicts that can result. Some of them are starting to talk about protecting their 'right to farm' against infringement by encroaching suburbs, but many are simply packing it in and giving up to the growing number of suburbanites in their midst. This marks the

second phase of the double whammy-the gradual erosion of the local agricultural economy and its domino effect on the remaining farmers.

"As farm after farm succumbs to pressure, fewer suppliers of farm equipment, seed, fertilizer and other agricultural necessities can stay in business. There just isn't enough trade to allow them to make a decent profit, so they close shop or move to another location. Jobs and income are lost to the community when the local agribusinesses go under. The farmers who have not been harassed off their land must then travel greater distances, lose more time and pay more money in order to get supplies and have equipment repaired. These additional costs and frustrations of the farmer, in turn, put more pressure on him to sell his land, and the vicious cycle repeats itself until a productive and treasured way of rural life is transformed beyond recognition."

Thus the dilemma faced by many counties today, including Benton County - the increased pressure for residential development on the farmlands that are so important to the economic base of the County, the State, and the Nation. As stated in the conclusion of the National Association of Counties study:

"Communities that provide for a flexible balance between the preservation of farmland and the development of housing and industry are most likely to succeed.

Farmland preservation is a sophisticated process that seeks to meet community residential and industrial development goals by directing such development onto lands where it is most appropriate, thus saving the most valuable farmlands and sustaining native agricultural industry. Communities cannot afford to ignore the 'other side of the coin' in trying to preserve farmland. Generally speaking . . . it is not the extent of development so much as the improper type of development - sprawling 'leapfrog' or 'scattershot' development that undermines local agriculture . . . In most communities, there is room for both development and agriculture, and the success of farmland preservation depends on finding an appropriate mix that will neither stifle reasonable development nor contribute to the ruin of the local agricultural economy."

A point of unanimous agreement of the farmland studies examined seemed to be that the solution to the problem lay with local land use planning efforts. A quotation, cited in the National Agricultural Lands Study publication states, "As cropland becomes more scarce, it can be protected from competing nonfarm demands only through land-use planning." The concluding statement in that publication, by a former Assistant Secretary of Agriculture speaking of agricultural land traditions, states:

"Hasn't the time come for a comprehensive effort by local governments, aided by state and federal agencies, to preserve some of these traditions, in a democratic way through the use of local land use plans approved by local people?"

One of the major premises of this Comprehensive Plan is that sound land use planning can help solve this problem. One of the underlying precepts of the Plan is to provide for substantial growth, while at the same time planning for that growth in such a way so as to guide it away from the County's most valuable agricultural lands.

FINANCIAL INSTITUTIONS

Trends in the activities of an area's financial institutions are an indication of that region's commercial vitality. Table 44 presents total deposits by year and city for all branches of commercial banks, mutual savings banks, and savings and loan associations in Benton County. As is shown, total deposits have increased approximately 56 percent during the period 1976-1980.

PORT DISTRICTS

Port districts are municipal corporations established to encourage and enhance the economic development of the area within their jurisdictions. Benton County is divided between two port districts, the Port of Benton and the Port of Kennewick (See Map 34).

Port districts are directed by three person commissions elected by the voters residing within respective district boundaries. Both port districts in Benton County have a port manager and staff who administer port activities and provide technical expertise to their commissions regarding industrial development and research. Each port district has the authority to fund and develop a variety of projects to assist industry, commerce and trade, and each can acquire and improve land for sale or lease to industrial firms. Each district has the authority to establish "industrial development districts" within their jurisdictions for purposes of facilitating the establishment and development of industry and/or the improvement of transportation facilities. Within established industrial development districts, the port can acquire land by purchase and/or condemnation and can exercise the right of eminent domain.

Current industrial development districts in Benton County include the Prosser and Richland Industrial Parks and the Richland Airport.

The Port of Benton owns land in and to the east of Prosser, west of Benton City and in the City of Richland. The Port of Kennewick owns parcels in and south of the City of Kennewick at various locations adjacent to the Columbia River and also a parcel at Plymouth. Although both port districts have development and sold lands for industrial purposes in the past and will continue to do so in the future when and where appropriate, their current policies emphasize the development and lease of property in order to supplement revenues for use in the future economic development of their respective areas. At the present time, the two ports have some 15 industrial sites in varying stages of development.

TABLE 44: TOTAL DEPOSITS; COMMERCIAL BANKS, MUTUAL SAVINGS BANKS, AND SAVINGS AND LOAN IN BENTON COUNTY; 1976-1980

CITY	1976	1977	1978	1979	1980
Kennewick	$122,058,000	$142,042,000	$183,255,000	$213,049,000	$235,430,000
Richland	153,366,000	147,925,000	174,755,000	187,555,000	200,722,000
Prosser	33,949,000	36,453,000	38,454,000	42,128,000	43,324,000
Benton City	4,728,000	5,399,000	6,135,000	6,677,000	7,170,000
West Richland	---	685,000	1,966,000	2,486,000	2,433,000
Total Benton Co.	$314,101,000	$332,504,000	$404,565,000	$451,895,000	$489,129,000

Source: Branch Deposits, 1976-1980, Commercial Banks, Mutual Savings Banks and Savings and Loan Associations in the State of Washington; Peoples, Bank, Seattle, Washington

EMPLOYMENT AND INCOME

Employment

Table 45 shows total nonagricultural wage and salary employment for Benton and Franklin Counties for the years 1973-1980. As shown, in 1980 the service industry was the largest employment category, with 15,220 jobs. This industry includes a whole range of services; including employment in hotels, business services, auto repair, health services, legal services, etc. Services has continually been the major employment sector for the entire period covered (1973-1980). As was mentioned earlier, it has been estimated that approximately 84 percent of the jobs in the service industry are related to the employment generated by the Hanford Site. (For a brief description of "basic" versus "non-basic" economic activity, see page 124.)

Following "services" was "wholesale and retail trade" with a total two county employment of 11,140. The relative rank of this employment sector also was constent (second) throughout the period covered. Following the services and trade industries, the three other large employment categories in the two-county area were government, manufacturing and construction. These three have consistently been large employers in the area but have varied in their relative magnitude of employment with construction being an especially volatile employment category.

Overall, the region has had a varied increase in employment. The increase was relatively steady until 1977 and 1978 when employment jumped 15 percent and 17 percent respectively. This would coincide with construction of the WPPSS nuclear power plants at Hanford. The 1979-1980 trend was a decrease of two percent in total employment. To a certain extent this could be attributed to labor disputes which idled some 1,070 workers, but the slowdown also coincided with national trends.

Income

Table 46 presents personal income statistics for Benton County for the years 1973-1978. As can be seen, services, from a personal income impact as well as from total number of jobs, is the largest employer in the County. Again it should be pointed out however, that nonbasic employment in such areas as the service industry is highly dependent upon the basic employment industries (e.g., Hanford and agriculture). Following the service industry in terms of personal

Benton County Comprehensive Plan

Port Districts

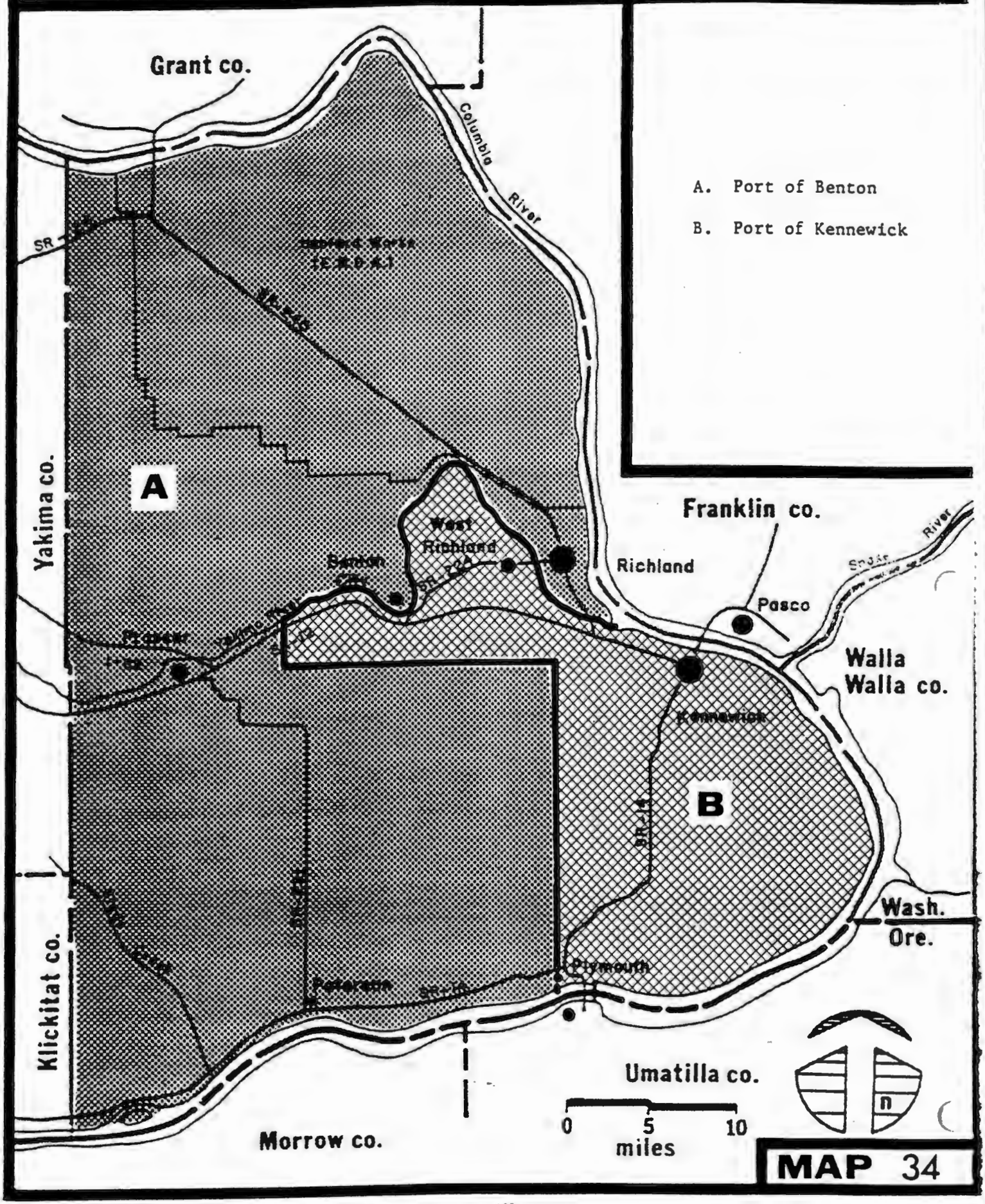


TABLE 45 : NONAGRICULTURAL WAGE AND SALARY EMPLOYMENT, BENTON AND FRANKLIN COUNTIES 1973-1980

	1973	1974	1975	1976	1977	1978	1979	Preliminary 1980
Manufacturing								
Food and related products	1,880	1,850	2,050	2,300	2,300	2,540	2,530	2,520
Printing and publishing	410	440	490	470	510	530	470	420
Chemical and related products	2,720	3,030	3,390	3,540	4,180	4,760	5,280	5,330
Stone, clay and glass products	70	80	80	90	160	160	160	140
Fabricated metal products and machinery (exc. electrical)	320	390	600	460	360	330	330	370
Other manufacturing	300	300	310	450	530	610	540	470
Subtotal	5,700	6,090	6,920	7,310	8,040	8,930	9,310	9,250
Mining and Miscellaneous	180	230	70	20	60	70	60	60
Contract Construction	3,090	3,960	5,390	5,330	7,400	9,810	11,110	8,780
Transportation, Communication, and Utilities	1,800	1,780	1,740	1,890	2,010	2,340	2,430	2,390
Wholesale and Retail Trade	6,110	6,470	6,990	8,080	9,040	10,460	11,390	11,140
Finance, Insurance, and Real Estate	870	950	930	1,090	1,330	1,480	1,670	1,710
Services	7,520	8,670	9,590	10,590	12,010	13,560	14,320	15,220
Government	5,310	5,720	6,280	6,770	7,470	8,520	9,390	10,050
TOTAL	30,580	33,870	37,910	41,080	47,360	55,170	59,680	58,600
WORKERS IN LABOR-MANAGEMENT DISPUTES	0	40	0	1,530	0	0	0	1,070

Source: Draft Environmental Impact Statement, Ethyl Alcohol Facility, Port of Kennewick, Washington, May, 1981.

income generation were construction and manufacturing, respectively.

Locational Quotients

Locational quotients are often utilized to compare relative share of a county's employment by sector to the nationwide sector share of total U.S. employment. The use of locational quotients will indicate for example if the portion of a county's employment in the manufacturing sector is more or less than the national average. If the employment sector has a greater than average share, the locational quotient will be greater than one; if the sector has less than average share, the locational quotient will be less than one. As is shown on Table 47, the construction industry portion of Benton County's employment was far over the national average. This would be a reflection of construction activity on the WPPSS projects. Also above the national average for percentage of employment were the service and farm sectors. Below national averages were the retail trade; manufacturing; government; finance, insurance, and real estate; transportation and utilities; and wholesale trade sectors.

TABLE 47: 1978 LOCATION QUOTIENTS FOR BENTON COUNTY

INDUSTRY	LOCATION QUOTIENT
Construction	4.3410
Services	1.6519
Farm	1.4746
Retail Trade	.7040
Manufacturing	.6946
Government	.6326
Finance, Insurance and Real Estate	.3515
Transportation and Public Utilities	.3439
Wholesale Trade	.2183

Source: U.S. Bureau of Economic Analysis

Employment Projections

Table 48 presents Bonneville Power Administration employment projections for Benton County to the year 2000. These employment projections are not officially endorsed by this Comprehensive Plan, but are included to provide perspective as to certain employment trends that might evolve between now and the year 2000.

LONG-RANGE NEEDS

An Economic Assessment of Area XII completed by the Washington Department of Commerce and Economic Development in 1978, included a general economic forecast for Benton County. Those conclusions were as follows:

> "Relatively rapid economic expansion is expected to continue in Benton County during the next two decades. Recent employment forecasts projected employment growth rates averaging in the vicinity of 3 percent per year through 1995. Both manufacturing and non-manufacturing sectors are expected to grow considerably, with the largest growth rates in the latter area of the economy. Within manufacturing, food and kindred products is expected to be the leading growth industry, although chemicals and petroleum will remain the dominant industry. Overall, the continued development of nuclear-oriented industries will likely be the leading source of expansion. In addition, a considerable potential for irrigation development in Benton County will probably create growth in agriculture and related activity."

Also looking to the future in regard to the County's economy has been the "Overall Economic Development Program" (OEDP) of the Benton-Franklin Governmental Conference. The latest report of that program (the 1980 Annual Report) reiterated what have long been recognized as the major long-term needs in regard to the County's economy, i.e., the need to (1) support the area's basic industries of nuclear power and agriculture, and (2) to continue to diversify the area's economy so as to lessen the heavy dependence on the nuclear industry for the region's economic well-being. As stated in the OEDP 1980 Report, "Because of a heavy reliance upon the nuclear industry as the backbone of this area's economy and the unpredictable character of that industry, the need for diversification is clear."

As stated in the OEDP report, "The Benton-Franklin area has resources that make it one of the

TABLE 46: BENTON COUNTY PERSONAL INCOME BY MAJOR SOURCES (Thousands of Dollars), 1973-1978

	1973	1974	1975	1976	1977	1978
Total Labor and Proprietors Income by Place of Work						
By Type						
Wage and Salary Disbursements	236,955	288,893	369,252	422,295	551,067	688,385
Other Labor Income	11,382	14,676	20,128	24,741	33,519	42,556
Proprietors Income	37,765	44,188	45,485	41,387	39,036	53,453
Farm	17,288	23,372	19,901	8,215	2,468	13,192
Non-Farm	20,477	20,816	25,584	33,172	36,568	40,261
By Industry						
Farm	26,486	35,049	33,935	26,056	17,681	29,108
Non-Farm	259,616	312,708	400,930	462,367	605,941	755,286
Private	220,482	267,236	344,653	396,044	532,657	673,674
Ag. Serv., For., Fish and Other	1,326	1,566	(D)	(D)	(D)	(D)
Mining	100	122	(D)	(D)	(D)	(D)
Construction	42,407	54,822	88,705	90,113	151,521	206,230
Manufacturing	54,438	65,560	79,233	94,184	118,505	142,855
Non Durable Goods	48,810	59,342	71,483	84,640	104,874	126,382
Durable Goods	5,628	6,218	7,750	9,544	13,631	16,473
Transportation and Public Utilities	7,233	8,128	9,582	12,288	16,029	20,610
Wholesale Trade	4,314	5,862	7,212	7,944	8,330	11,222
Retail Trade	23,883	26,657	30,788	37,286	44,448	55,140
Finance, Insurance, and Real Estate	6,019	6,239	6,522	8,889	12,574	15,913
Services	80,762	98,280	120,763	143,432	178,708	218,080
Government and Government Enterprises	39,134	45,472	56,277	66,323	73,284	81,612
Federal, Civilian	7,200	8,022	9,393	10,862	11,530	13,088
Federal, Military	800	794	838	919	981	1,065
State and Local	31,134	36,656	46,046	54,542	60,773	67,459
Total Labor and Proprietors Income by Place of Work	286,102	347,757	434,865	488,423	623,622	784,394

(D) Not shown to avoid disclosure of confidential information, data included in total.

Source: U.S. Bureau of Economic Analysis

most promising economic areas of the state." The intent of this economic element is to provide the background information necessary for an understanding of and appreciation for the basic factors that provide for the livelihood of the County's citizens. Special emphasis has been given to those factors which are impacted by and impact upon county land use decisions and policies. County decisions and policies can have a significant impact upon the degree and direction of economic development in the County. This Comprehensive Plan is designed to provide a framework which will be helpful to the County's efforts to strengthen its economy, and which will hopefully increase the awareness of the interrelatedness of the County's economy and land use policies.

TABLE 48: BPA EMPLOYMENT PROJECTION FOR BENTON COUNTY, 1985-2000

	1985	1990	1995	2000
Total Employment (Establishment)	56,000	61,000	66,900	72,100
Agriculture	2,400	2,375	2,375	2,350
Non-Agriculture Self-Employment	3,400	3,525	3,625	3,750
Total Non-Agricultural Employment	50,200	55,100	60,900	66,000
Mining	50	50	50	50
Construction	5,575	4,175	4,550	4,925
Manufacturing	8,200	8,875	9,425	9,875
Food and Kindred Products	(1,425)	(1,575)	(1,725)	(1,800)
Lumber and Wood Products	-	-	-	-
Paper and Allied Products	-	-	-	-
Primary Products	(175)	(175)	(200)	(200)
Transportation Equipment	-	-	-	-
Other Manufacturing	(6,300)	(6,925)	(7,400)	(7,775)
Transportation and Public Utilities	1,675	1,875	2,025	2,175
Wholesale and Retail Trade	10,125	11,925	13,475	14,950
Finance, Insurance and Real Estate	1,525	1,850	2,150	2,425
Services	16,350	18,850	20,950	22,725
Government	6,700	7,500	8,275	8,875

Source: Washington: Population, Employment and Households Projected to 2000, Bonneville Power Administration, July, 1979

Note: Figures given are for sources of employment within Benton County, regardless of place of residence of those employed.

CHAPTER XI

LAND USE ELEMENT

INTRODUCTION

The general purpose of this, the final Element of the Comprehensive Plan, is to provide a long-range guide for the physical development of Benton County that will maximize the County's livability. To a large extent, this Element is a culmination and synthesis of the findings and long-range needs analysis contained in the previous Elements.

The first section of the Element presents existing land use patterns and trends found within the County. The second section provides an analysis of how much land will be needed for various uses over the long-range planning period. The final section presents the long-range land use plan.

EXISTING LAND USE

Overview

Identification and analysis of existing land use patterns and trends is an important part of the plan development process. The existing land use pattern establishes important parameters for developing the land use plan. For example, the location of an existing airport in a planning area has obvious implication for the types of development that might be planned for the immediate vicinity.

An analysis of a planning area's existing land use will generally yield two major factors in regard to the plan development process:

1. The location of existing land uses will identify areas where new or additional uses would be compatible or incompatible with the existing uses.

2. Existing land use patterns and trends will provide a general indication of the major forces of supply and demand that are operating in the planning area in regard to land. This in turn is important as an indication as to whether a planned land use would be in synchronization with operating market forces or would be bucking these trends.

As indicated by the above, a careful analysis of a planning area's existing land use in an important part of the plan development process. Accordingly, one of the first steps taken in the development process for Benton County's Comprehensive Plan was a thorough survey of the County's land area. The survey was conducted in the fall of 1978 and included both on-site field survey methods and utilization of aerial photographs. The results have been updated to reflect city annexations as of July 1982.

The results of the land use survey were tabulated and mapped on Countywide and planning region maps. The Countywide map, as the name suggests, covers the entire County, and its depiction of existing land uses is necessarily generalized due to the large scale. More detailed maps have been prepared for five planning regions which cover the major developing areas of the County. These existing land use maps are found at the end of this section. In tabulating existing land uses, land area by use was calculated through planimeter measurements. The resulting figures are therefore in the form of estimates and are not meant to imply exact acreages. It should be noted that the maps included at the end of this section are not the maps that have been utilized to calculate acreages for the various uses. Rather these maps have been generalized to facilitate their inclusion in this document.

The findings that resulted from this research and analysis of the County's existing land use are described in the following text, tables, and maps of this section. The key findings that evolved out of this process constitute one of the factors that culminated in the goals, policies, recommendations, and maps of the Comprehensive Plan.

Total County

Benton County consists of a total of 1,095,910 acres. Table 49 and Map 34 present the general existing land uses found within the County. The following is a more detailed description of those uses and their general locations.

Hanford Site

The Hanford Site, over which Benton County has little or no land use jurisdiction, occupies some 270,720 acres in the northeast portion of the County. This acreage represents approximately 25 percent of the County's land area.

For the most part, land use at the Hanford Site consists of a number of nuclear energy and related industrial activities in scattered locations throughout the 423 square mile portion of the Site that is located in Benton County. As shown on Map 30, the southeast portion of the Site contains the WPPSS power generation plants under construction and the Fast Flux Test Facility (FFTF). The operating "N" Reactor and the other shut down reactors are located along the south bank of the Columbia River in the northern portion of the site, chemical processing and radioactive waste management activities are located in the center of the site and the southwestern portion of the site is in an "ecology preserve" natural state. For a more detailed description and map of the activities at the Hanford Site, see the Nuclear Energy and Related Activities section of the Economic Element.

Incorporated Cities

According to figures provided by the cities, and updated by the Benton County Planning Department, the total land area occupied by the County's five incorporated cities is 47,008 acres or four percent of the County's total land area. The figures are shown by city in Table 50.

TABLE 49: BENTON COUNTY EXISTING LAND USE, FALL 1978
(updated to reflect city annexations as of July, 1982)

LAND USE	ACREAGE	PERCENT
Hanford Site	270,720	25
Incorporated Cities	47,008	4
Unincorporated Area		
Dryland Agriculture	346,000	32
Rangeland and Undeveloped	259,974	24
Irrigated Agriculture	158,150	14
Residential	10,662	1
Public and Semi Public	2,041	0
Industrial	480	0
Aggregate Resources	375	0
Commercial	281	0
Marshland	219	0
Total Unincorporated Area	778,182	71
TOTAL COUNTY AREA	1,095,910	99*

*Does not add up to 100% due to rounding.

TABLE 50: INCORPORATED CITIES LAND AREA, July 1982

CITY	ACREAGE	PERCENT
Richland	20,474	44
West Richland	13,594	29
Kennewick	9,950	21
Prosser	2,080	4
Benton City	910	2
TOTAL	47,008	100

Source: Individual cities, updated by Benton County Planning Department, July, 1982

Unincorporated Area

The major areas over which Benton County has little or no land use planning control are the 270,720 acres located within the Hanford Site and the 47,008 acres of the incorporated cities. This leaves approximately 778,182 acres or 71 percent of the County's total land area as unincorporated land under Benton County's land use planning jurisdiction. The existing land use patterns in this area are discussed in the following sections.

Dryland Agriculture - As can be seen from Table 49 and Map 35, the largest single land use (346,000 acres or 32 percent of the County total) within the unincorporated area is dryland agriculture. This land use, which consists almost exclusively of dryland wheat and summer

fallow, is located throughout the Horse Heaven Hills portion of the County and in the northwestern area of the County, north of the Roza Irrigation District. The Horse Heaven Hills portion accounts for approximately 80 percent of the land in this use.

Rangeland and Undeveloped - This land use constitutes approximately 25 percent (259,974 acres) of the total County land area and is composed mostly of rangeland used for grazing (about 239,000 acres) and undeveloped or vacant land (about 21,000 acres).

Rangeland activities consist largely of cattle grazing where forage is available and where sufficient sized blocks of grazing land are found to make grazing economical. One Benton County cattle rancher has indicated that as many as 200 acres of grazing land are needed per head of cattle, illustrating the large tracts of land needed for grazing operations. Cattle are normally grazed between the months of October and April when dead stands of bunchgrass are available during the winter months and cheatgrass is available during the early spring. These lands are normally grazed on an annual rotation system, thereby allowing the forage grasses to become reestablished. During the summer and fall months, the cattle are placed on irrigated pasture lands.

Undeveloped or vacant land is primarily in an open space type of use. Most of the land in this category is found in remote areas and/or is economically unsuited to a more productive use due to factors such as topography or soil conditions. Examples would be area that are excessively steep or rocky. These kinds of areas are found in locations throughout the unincorporated area and may be defined as unimproved private lands not being used for agricultural purposes.

Irrigated Agriculture - Irrigated agriculture accounts for approximately 158,000 acres or 14 percent of the County's total land area. As was pointed out in the Economic Element, although constituting only 21 percent of the County's agricultural land, irrigated agriculture accounts for approximately 85 percent of the County's total agricultural production value. This use is found in two major areas:

1. The Yakima Valley which is located along the County's midsection from the Yakima County line four miles west of Prosser, to the Finley area. This area is supplied with irrigation water by a number of irrigation districts that obtain water from the Yakima Project which is served by Yakima River waters. Approximately 88,000 irrigated acres are found in this area.

2. Several somewhat isolated locations in the southern part of the Horse Heaven Hills. Irrigation water for this area (approximately 71,000 acres) is obtained from the Columbia River.

A large variety of crops are grown on these irrigated lands. For a more detailed description of this land use, see the Agriculture section of the Economic Element.

Residential - Unincorporated lands devoted to residential use accounted for approximately 10,660 acres or one percent of the total County land area. Lands included in this category consisted of those areas with clusters of two or more dwellings.

This land use is located almost exclusively within the five planning regions which cover the developing areas of the County and is found primarily near incorporated cities and unincorporated communities. Rural residential areas encompass much of the Finley vicinity and surrounding area east of Kennewick. Smaller pockets of rural residential land use are found in the lower Yakima Valley, Badger Canyon, and Horn areas. Recent rural residential development south of Richland and west of Kennewick is anticipated to expand and eventually merge with the Richland and Kennewick urban areas. These residential uses are shown on the planning region maps found at the end of this section.

The following land uses each contain less than one percent of the County's total land area.

Public and Semi-Public - This category includes some 2,041 acres in the unincorporated area. It consists of park uses such as Columbia Park and Crow Butte State Park, as well as activities such as the Irrigated Agricultural Research and Extension Center lands north of Prosser.

Industrial - Industrial activities constitute approximately 480 acres in the unincorporated area. Exclusive of the Hanford Site, most of the industrial activities located in the County are related to food processing and chemical manufacturing. The largest concentration of industrial use is found east of Kennewick and Finley along the Columbia River. Other major industrial sites include nuclear-related activities in northern Richland, food processing plants east of Prosser and the liquid natural gas compressor station and corn drying facility located west of Plymouth.

Aggregate Resources - This mineral resource extraction activity occupies some 375 acres in the unincorporated area. Their locations are shown on the planning region maps.

Commercial - Occupying approximately 281 acres in the unincorporated area, commercial uses are found in the vicinity of the incorporated cities as well as forming the basis for the rural service centers such as Whitstran, Paterson, Finley and Plymouth.

Marshland - There are 219 acres of marshland located on the planning region maps.

Planning Regions

As mention earlier, the developing areas of the County have been delineated separately on five planning region maps to allow for greater detail of analysis of those areas. These maps are included at the end of this section. The following is a brief summary of the existing land use found in the planning regions

Prosser-Roza

The most extensive land use by far in the Prosser-Roza planning region is irrigated agriculture. This activity occupies some 38,000 acres or approximately 56 percent of the planning region. It includes the fertile lower Yakima Valley north of Prosser.

TABLE 51: EXISTING LAND USE - PROSSER-ROZA PLANNING REGION, FALL, 1978
(updated to reflect city annexations as of July, 1982)

LAND USE	ACREAGE	PERCENT
Incorporated City	2,080	3
Unincorporated Area		
Residential	2,994	4
Commercial	49	0
Industrial	152	0
Public and Semi-Public	470	1
Aggregate Resources	78	0
Irrigated Agriculture	38,283	56
Dryland Agriculture	7,086	10
Rangeland & Undeveloped	17,540	26
Marshland	31	0
Total Unincorporated Area	66,683	97
TOTAL PLANNING REGION	68,763	100

The second most extensive land use in the planning region, rangeland and undeveloped, constitutes some 17,540 acres (26 percent of the planning region) and is found primarily on the north face of the Horse Heaven Hills. Dryland agriculture (10 percent of the planning region) is found on the Horse Heaven Hills, south of the north slope, and north of the area served by the Roza Irrigation District. A number of rural residential lots are found in the planning region north of Prosser. There are two communities in the planning region. Prosser, the county seat, occupies 2,080 acres. Whitstran is a rural service center located approximately three miles northeast of Prosser. Also located in this planning region is the Irrigated Agriculture Research and Extension Center, found in two units north of Prosser.

Benton City-Kiona

The largest land use in the Benton City-Kiona planning region is rangeland and undeveloped. This use occupies approximately 50 percent (30,000 acres) of the planning Region area. Major locations of this use in the planning region are found on the north face of the Horse Heaven Hills, in the area known as the "Badlands" some three miles west of Benton City, in the northern portion of the planning region, and in the area east of Benton City.

Large dryland agriculture areas are located on the Horse Heaven Hills, south of the north face and in the northwest portion of the planning region. Irrigated agriculture is found north and northwest of Benton City, with a great deal of rural residential use located throughout the former.

Benton City occupies approximately 910 acres of the Planning region. In 1981 approximately 4,000 acres in the Horn area of the planning region were annexed by the City of West Richland.

TABLE 52: EXISTING LAND USE - BENTON CITY-KIONA PLANNING REGION, FALL, 1978
(updated to reflect city annexations as of July, 1982)

LAND USE	ACREAGE	PERCENT
Incorporated City	4,928	8
Unincorporated Area		
Residential	1,507	3
Commercial	1	0
Industrial	10	0
Public and Semi-Public	117	0
Aggregate Resources	20	0
Irrigated Agriculture	10,799	18
Dryland Agriculture	12,025	20
Rangeland & Undeveloped	29,927	51
Total Unincorporated Area	54,406	92
TOTAL PLANNING REGION	59,334	100

Richland-West Richland

Extensive amounts of rangeland and undeveloped land use are found in the Richland-West Richland planning region. This use accounts for approximately 38,117 acres or 43 percent of the total planning area. Much of this acreage is located in the area surrounding the Badger Mountain, Candy Mountain, and Goose Hill uplands. This land use is also found on the north face of the Horse Heaven Hills within the planning region.

Approximately 30,322 acres (35 percent) of the planning region is occupied by the cities of Richland, West Richland, and Kennewick which contain 20,405 acres, 8,526 acres, and 1,391 acres respectively in the planning region.

As can be seen, the two uses, rangeland-undeveloped and incorporated city, account for approximately 80 percent of the total land area of the planning region. Together they occupy the bulk of the area.

TABLE 53: EXISTING LAND USE - RICHLAND-WEST RICHLAND PLANNING REGION, FALL, 1978
(updated to reflect city annexations as of July, 1982)

LAND USE	ACREAGE	PERCENT
Incorporated City	31,372	36
Unincorporated Area		
Residential	1,402	2
Commercial	100	0
Public and Semi-Public	14	0
Aggregate Resources	15	0
Irrigated Agriculture	9,995	11
Dryland Agriculture	6,589	8
Rangeland & Undeveloped	38,017	43
Marshland	152	0
Total Unincorporated Area	56,284	64
TOTAL PLANNING REGION	87,656	100

There are approximately 10,000 acres (11 percent) in the planning region devoted to irrigated agriculture. This use is found in the form of center-pivot (circle) irrigation systems in much of the area northwest of West Richland. Other locations of this land use are the flood plain

area between the Yakima River and Horn Rapids Ditch and along Badger Road in the southern portion of the planning region. Approximately 6,600 acres of dryland agriculture are located on the Horse Heaven Hills in the southernmost portion of the planning region.

Kennewick-Finley

The single largest land use in the Kennewick-Finley planning region is rangeland and undeveloped. This use occupies some 16,687 acres (32 percent) of the planning region and is located largely along the north face of the Horse Heaven Hills. Dryland agriculture accounts for approximately 12,000 acres (23 percent of the planning region) and is found on top of the Horse Heaven Hills.

Irrigated agriculture land use occupies approximately 10,000 acres in the planning region, representing about 19 percent of the total area. Most of this land use is found in the area that stretches southeast from Kennewick for a distance of about six miles between the Columbia River and the Division Four Canal. This entire area is almost completely inundated with scattered rural residential development. The resulting checkerboard pattern is so extensive as to make separation of the uses almost impossible.

TABLE 54: EXISTING LAND USE - KENNEWICK-FINLEY PLANNING REGION, FALL, 1978
(updated to reflect city annexations as of July, 1982)

LAND USE	ACREAGE	PERCENT
Incorporated City	8,628	16
Unincorporated Area		
Residential	4,633	9
Commercial	120	0
Industrial	231	0
Public and Semi-Public	529	1
Aggregate Resources	191	0
Irrigated Agriculture	10,071	19
Dryland Agriculture	12,040	23
Rangeland & Undeveloped	16,687	32
Total Unincorporated Area	44,502	84
TOTAL PLANNING REGION	53,130	100

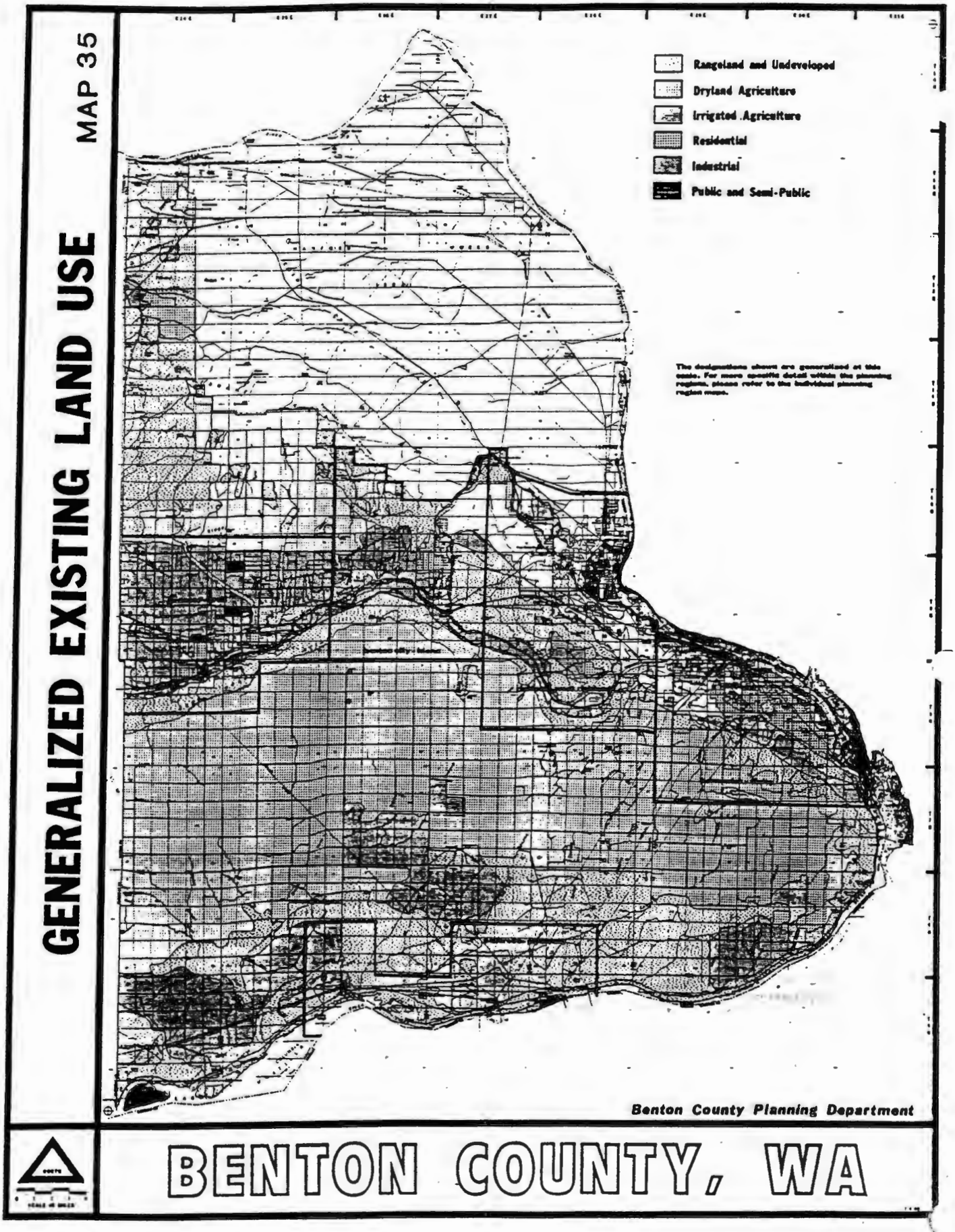
The incorporated area in the planning region occupies approximately 8,628 acres (16 percent) and is composed primarily of the City of Kennewick (8,559 acres in the planning region) and a small portion of the City of Richland (69 acres).

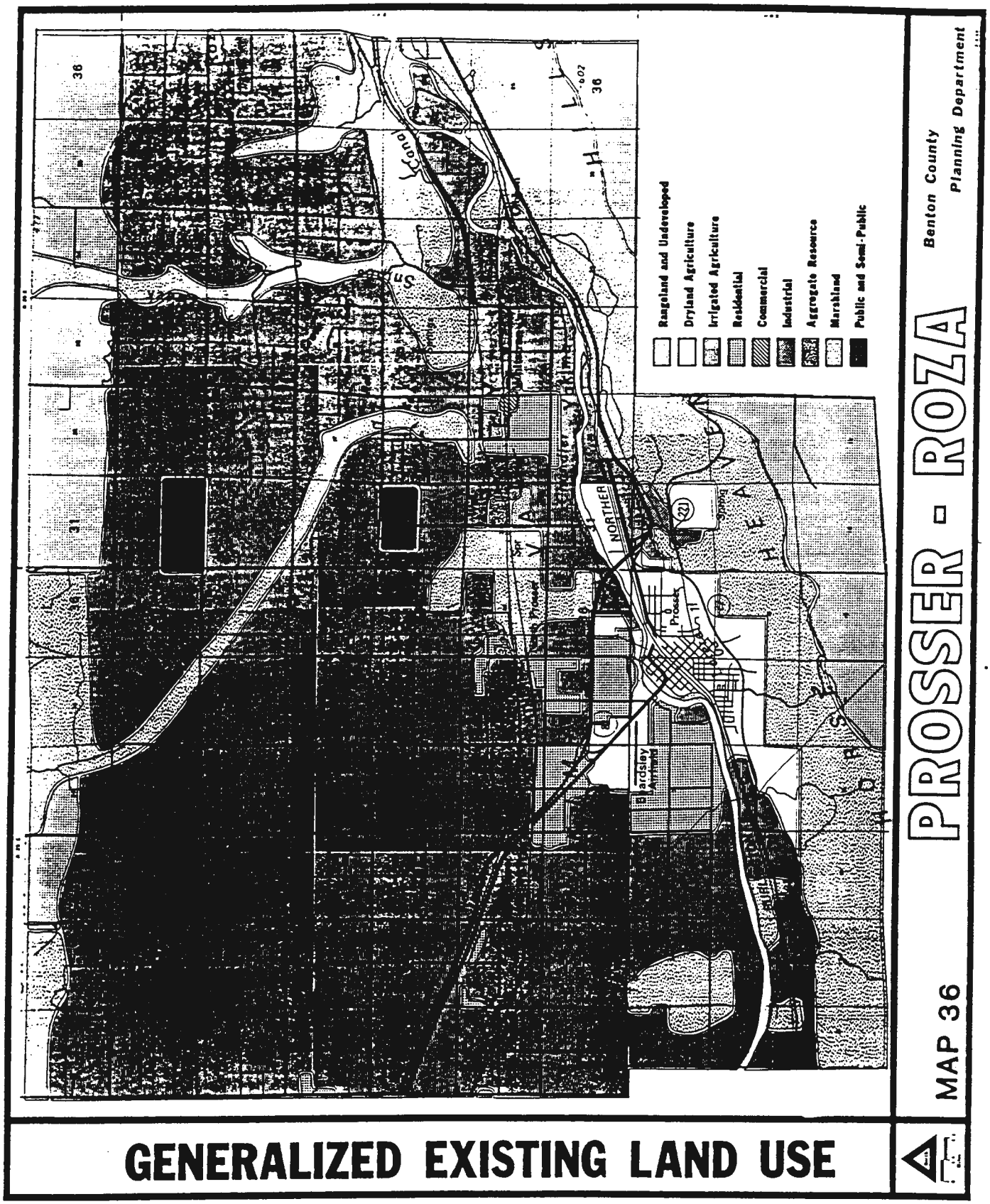
Residential land use in the unincorporated portions of the planning region accounts for some 4,633 acres or nine percent of the total area. This use is quite intensive in this planning region and is found in the area southeast of Kennewick described earlier as well as in the County "island" within the City which are almost totally devoted to residential use.

Paterson-Plymouth

The vast majority of land in this planning region is under rangeland and undeveloped use. This use category accounts for approximately 33,421 acres or nearly three-quarters of the planning region's total land area. This planning region is by far the most sparsely developed of the five planning regions. It contains no incorporated cities. The unincorporated communities of Paterson and Plymouth are included in the planning region, each of which consists of relatively small clusters of residential development with a few commercial and public uses located in each community.

Irrigated agriculture occupies approximately 12,000 acres (26 percent) of the planning region. This use, together with the rangeland and undeveloped category, constitutes approximately 26 percent of the planning region's land use.

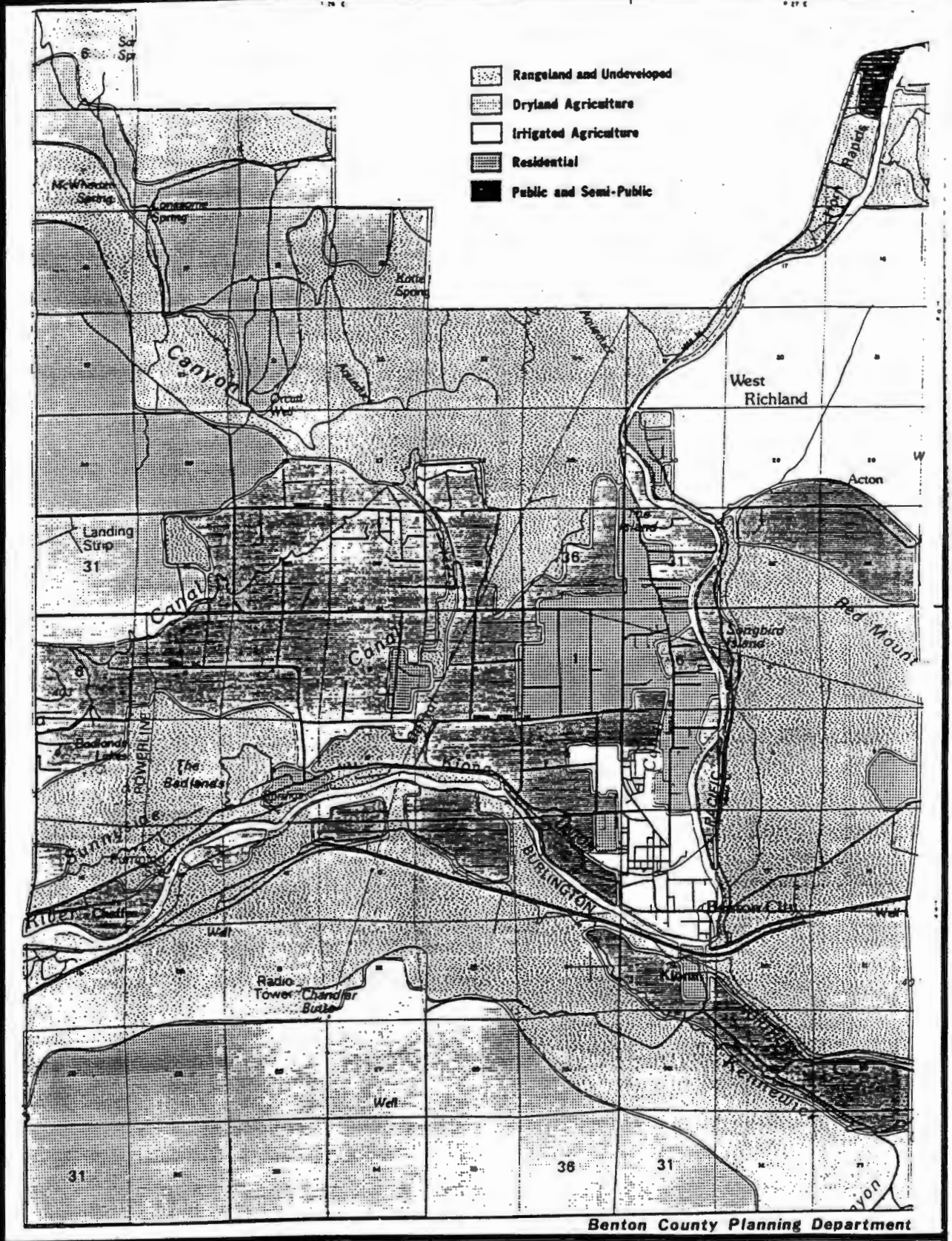

MAP 35
GENERALIZED EXISTING LAND USE
Rangeland and Undeveloped
Dryland Agriculture
Irrigated Agriculture
Residential
Industrial
Public and Semi-Public
Benton County Planning Department
BENTON COUNTY, WA



GENERALIZED EXISTING LAND USE

GENERALIZED EXISTING LAND USE

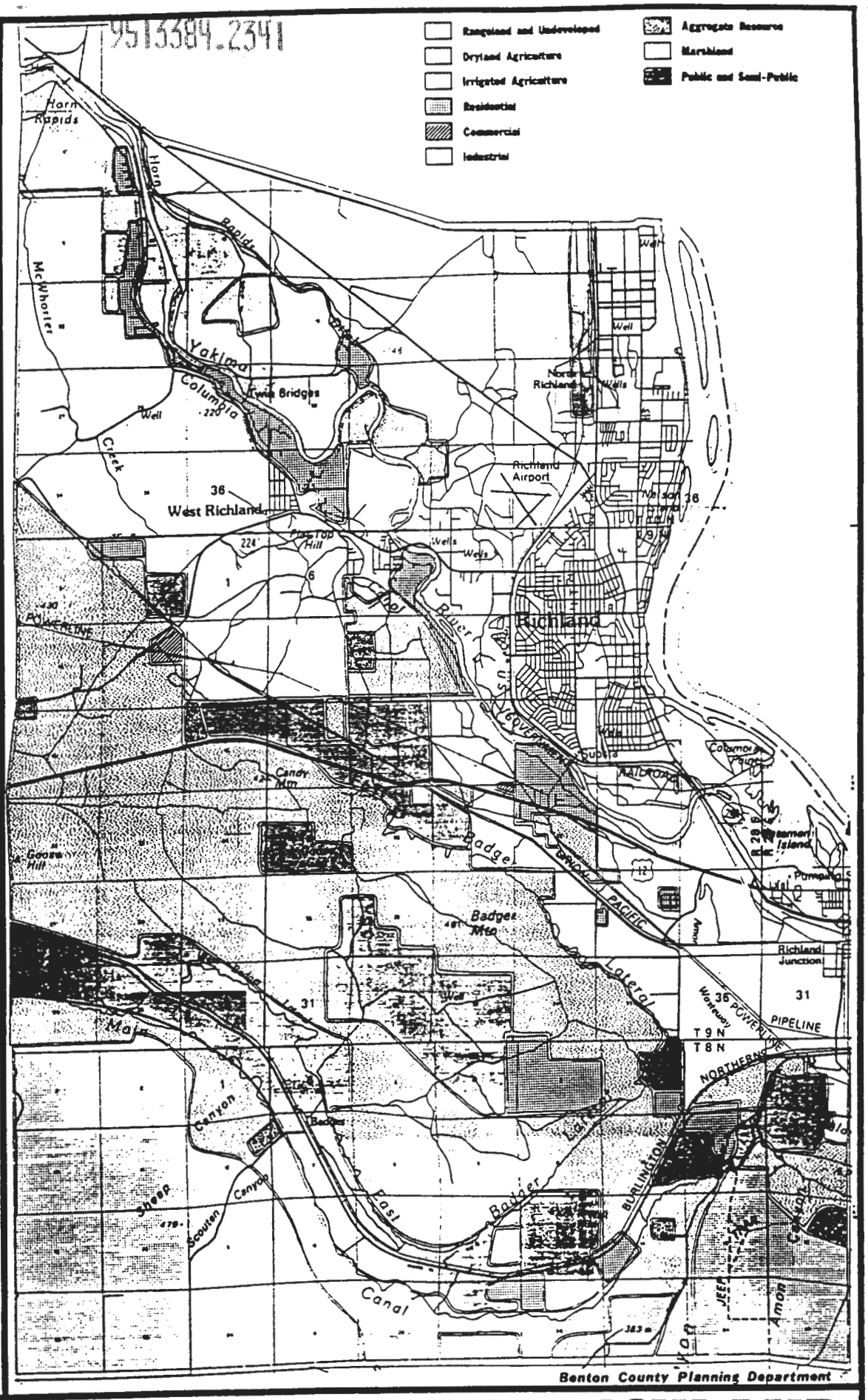
MAP 37



BENTON CITY - KIONA

MAP 38

GENERALIZED EXISTING LAND USE



Benton County Planning Department

RICHLAND - WEST RICHLAND

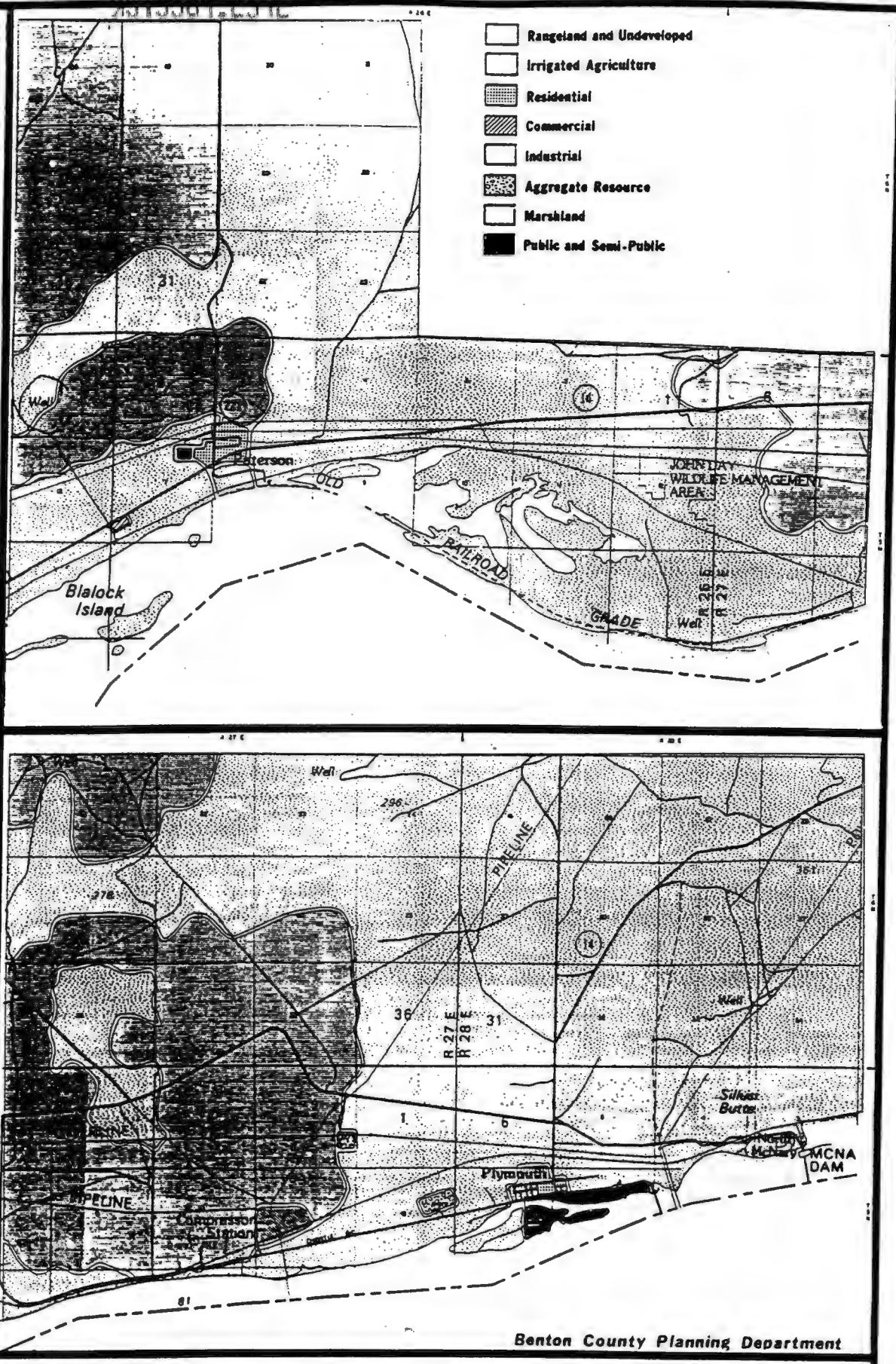
GENERALIZED EXISTING LAND USE

KENNEWICK - FINLEY

MAP 39

GENERALIZED EXISTING LAND USE

MAP 40



Benton County Planning Department

PATERSON - PLYMOUTH

TABLE 55: EXISTING LAND USE - PATERSON-PLYMOUTH PLANNING REGION, FALL, 1978
(updated to reflect city annexations as of July, 1982)

LAND USE	ACREAGE	PERCENT
Incorporated City	0	0
Unincorporated Area		
Residential	126	0
Commercial	11	0
Industrial	87	0
Public and Semi-Public	171	1
Aggregate Resources	71	0
Irrigated Agriculture	11,749	26
Rangeland & Undeveloped	33,421	73
Marshland	36	0
Total Unincorporated Area	45,672	100
TOTAL PLANNING REGION	45,672	100

LONG-RANGE LAND USE NEEDS

This section of the Land Use Element is designed to provide an indication as to approximately how much land will be needed in the County for various uses during the long-range planning period. The identified uses are residential, commercial, industrial, public and agriculture.

The estimates given as to the amounts of land needed for the different uses should be considered as general guides rather than absolutes. The calculations are largely based upon extrapolations of existing land use patterns and densities. It may very well be decided that a different pattern or density would lead to a better quality of life. The right to make such a choice is an inherent part of the comprehensive planning process. In light of these considerations, the following land need estimates are offered with the intent that they be used as general guides to assist in the process of determining how much land will be needed in the County for the various land uses over the long-range planning period.

Residential Land Use

The calculations included in the Housing Element indicated a projected need for 66,890 housing units in Benton County by the year 2000. If the current incorporated/unincorporated housing unit ratio of 74 percent/26 percent holds true for that long-range planning period, a year 2000 need estimate for 17,391 housing units in the unincorporated portion of the County results.

Lot sizes in areas designated for single family residential use in the Comprehensive Plan will range from approximately 7,000 square foot lots in the medium density residential designation to approximately five acre lot sizes in the RR-5 designation. Existing residential lot size patterns and total long and short subdivision activity within a recent three year period have been analyzed in order to determine prevailing lot size patterns and trends for residential use in the unincorporated area. An example of the results of this analysis was the finding that the average lot size of all short and long subdivisions recorded for the unincorporated area during the years 1978 and 1979 was 1.8 acres. For purposes of these calculations, an average residential lot size of 2.5 acres has been chosen. It is recognized that this figure is substantially larger than what the actual average lot size is likely to be, but it was felt that the choice of this figure is justifiable in order to ensure that sufficient land is allocated for residential use.

Applying the designated average lot size of 2.5 acres to the projected need for 17,391 housing units in the unincorporated area results in a residential land use need estimate of 43,478 acres. In order to determine the total area needed to be designated for residential use, a factor of 25 percent (10,870 acres) needs to be added to provide for street right-of-way use. The resulting needs estimate indicates that approximately 54,348 acres will need to be designated for residential land use in the unincorporated area in order to accommodate the County's projected long-range growth.

Commercial Land Use

As of 1980 there were approximately 281 acres of land in commercial use within the unincorporated portion of the County. Based upon the 1980 population count of 32,655 for the unincorporated area, this represents a ratio of 8.6 acres of commercial use per 1,000 people.

The year 2000 population projection for Benton County is 162,245 people. If the current incorporated/unincorporated population ratio of 70 percent/30 percent holds true for that long-range planning period, a year 2000 unincorporated population projection of 48,674 results. Applying the ratio of 8.6 acres of commercial use per 1000 population to this projection results in a needs estimate of approximately 419 acres of land that would be needed for commercial use by the year 2000 if the current ratio is maintained.

Industrial Land Use

In 1980 there were approximately 480 acres of land in the unincorporated portion of Benton County in industrial use. Based upon the 1980 population count of 32,655 people in the unincorporated portion of the County, this represents a ratio of 14.7 acres of industrial land use per 1,000 people. Applying this ratio to the year 2000 population projection of 48,674 for the unincorporated area results in a long-range needs estimate of 716 acres for industrial use in the unincorporated area if the current ratio is to be maintained.

Public Land Use

Parks

As outlined in the Benton County Comprehensive Parks and Recreation Plan - December, 1982, the Benton County Parks and Recreation Board has adopted the standard of 2.5 acres of park land per 1,000 total County population as a guide for determining the parks and recreational needs of the County. This standard relates to regional parks, such as Columbia Park, which serve the entire County population - not just the population residing in the unincorporated area. Based upon the year 2000 population projection of 162,245, a total regional parks needs estimate of 2,619.50 acres results if the adopted standard is to be met.

Schools

As has been mentioned in the Public Facilities and Services Element, in 1980 public school facilities within Benton County included 24 elementary schools, six middle or junior high schools, and seven high schools. Based upon the County's 1980 population of 109,444, this represented .22 elementary schools per 1,000 population, .06 middle or junior high schools per 1,000 population, and .06 high schools per 1,000 population.

The year 2000 population projection for the unincorporated area is 48,674. Assuming for extrapolative purposes that the portion of school facilities located in the unincorporated area is related to the size of the population living in the unincorporated area, the above-mentioned facilities ratios have been applied to the year 2000 population projection for the unincorporated area is order to determine a general long-range needs estimate for public school facilities in that area. The resulting needs estimates are for a total of 11 elementary schools, three middle or junior high schools, and three high schools in the unincorporated area.

Standard site criteria for school facilities are as follows:

Elementary Schools	10 acres
Middle or Junior High Schools	20 acres
High Schools	30 acres

Applying these standards to the facility needs estimates described earlier results in the following land needs estimate for land in the unincorporated area for public school use by the year 2000.

Elementary Schools	110 acres
Middle or Junior High Schools	60 acres
High Schools	90 acres
TOTAL	260 acres

Total Public

Parks and schools are the major uses that are dealt with in calculating public land use need estimates. Facilities such as police and fire stations occupy so little land that they do not appear on comprehensive plan land use maps.

The total long-range public land needs estimate is shown below:

1. Amount of land estimated to be needed in the unincorporated area for parks by the year 2000 . . . . . 2,619.5 acres

+ +

2. Amount of land estimated to be needed in the unincorporated area for schools by the year 2000 . . . . . 260 acres

= =

3. Total amount of land estimated to be needed in the unincorporated area for public use by the year 2000. . . . . 2,879.5 acres

Total Non-Agricultural Land Use Needs

Table 56 summarizes the foregoing land use need calculations.

TABLE 56: TOTAL ESTIMATED LONG RANGE (Year 2000) NON-AGRICULTURAL LAND USE NEEDS - BENTON COUNTY UNINCORPORATED AREA

USE		ESTIMATED ACRES NEEDED
Residential		54,348
Commercial		419
Industrial		716
Public		
Parks	(2,434)	
Schools	(260)	
Total Public		2,694
TOTAL		58,177

Agricultural Land Use

The remaining land use category is agricultural. This is a unique land use in that it is a land intensive basic economic land use that represents one of the two pillars upon which the County's economy rests. At the present time approximately 744,000 acres or 96 percent of the County's total unincorporated land area outside of the Hanford Site is being farmed or grazed.

The basic issues regarding the importance of this use to the County and the threats to its continued vitality are discussed in the Economic Element. As explained in that Element, the quandary is that the best agricultural land is in many cases also the most attractive land for urban and suburban development. In fact, the projected growth and development of the residential, commercial, industrial, and public uses described earlier in this section will in all likelihood occur at the expense of land that is presently being either farmed or grazed.

In light of the above, there is no specific long-range agricultural land use needs estimate. The key issue in this regard is to plan for the long range growth and development of the County so as to provide for that development while guiding it to areas other than where the County's best farmland is located. This has been one of the key principles of this comprehensive planning program from the very earliest stages when planning staff went out into the communities and rural areas to meet with the citizens in order to identify their major concerns regarding land use issues. This issue has been central to all public discussion as the process has proceeded and has been one of the major factors that have formed the basis for the goals, policies, recommendations, and maps that are the important guidelines of this Plan.

Conclusion

The foregoing calculations are meant to serve only as a general guide as the citizens and policymakers of the County designate land uses for the long-range planning period. The five general classifications of land use types (residential, commercial, industrial, public and agricultural) are the general land use designations that are indicated on the land use plan

maps. The calculations are provided to assist in the plan determination process, i.e., to introduce some reasonable parameters into the process of choosing the land use pattern that will guide the County's growth and developed over the 20 year planning period.

The first two sections of this Element have examined existing land use and projected long-range land use needs. The final section of the Element presents the land use plan.

LAND USE PLAN

Overview

The long-range land use plan is presented graphically on the land use plan maps (Maps 139-144). These maps, along with the goals, policies, and recommendations found on pages 10-24, constitute the major guidelines of the Comprehensive Plan. The purpose of the Plan maps; as well as the goals, policies, and recommendations, is to guide the growth and development of the County over the long-range planning period so that growth can be accommodated and the County's economic base and general livability protected.

Relationship to Zoning

The Comprehensive Plan maps should not be confused with zoning maps, for they are distinct legal instruments with markedly separate functions. The Comprehensive Plan is a guide and frame of reference for future land use, while the zoning map applies a specific district in the Zoning Ordinance to a specific property. The Comprehensive Plan is to serve as a guide for the Planning Commission and the Board of County Commissioners in reviewing and acting on zone changes. The Comprehensive Plan is comprehensive in a way no zoning ordinance can be in relating all the elements of land use and development in ways that allow for a well planned community or county.

The Plan maps are more general than and not as rigid as a zoning map. The boundaries of the land use designations are expected to be somewhat flexible, and the designations are meant to provide a general guide for land uses. A reasonable transition of uses is not to be precluded by the Plan maps.

Map Development Factors

The patterns of land use classifications designated on the Plan maps have evolved out of the extensive four year development and refinement process that has been devoted to the Comprehensive Plan. First and foremost in this process has been citizen involvement beginning with the very first stages of goal formulation in the spring of 1977 and continuing through the public hearings that have accompanied the Plan adoption process. The following is a brief description of the major factors that went into the development of the Land Use Plan Maps.

1. Citizen Involvement - As mentioned above, citizen involvement throughout all stages of the planning process has been one of the most important factors in determining the location and pattern of land use designations on the Plan maps. Over 100 citizen input meetings and workshops were held during the development process to ensure that all citizens had the opportunity to participate in the plan determination process. This is in addition to the citizen attitude survey mailed out to over 1500 County citizens in 1979, many comments submitted by mail and telephone, and the formal public hearing process that accompanied the later adoption stages of the Plan development process.

2. Goals, Policies, and Recommendations - The Plan goals, policies, and recommendations (pages 10 - 24) are primarily the result of the citizen involvement process. Many of these goals, policies, and recommendations provide criteria which relate directly to the determination of Plan land use locations and patterns. As a result, many of the land use designations shown on the Plan maps are direct expressions of the goals, policies, and recommendations.

3. Resource Inventory - A complete inventory of the County's physical characteristics, conditions, and resources was conducted during 1978 and 1979. The result of this effort was a detailed mapping of such factors as steep slope areas, flood plains, soil types, etc. The presence or absence of these factors has a direct bearing on the appropriateness or inappropriateness of different land uses in different areas. Accordingly, this information was given considerable weight during the Land Use Plan Map determination process.

4. Population Projections - An early recognition of the high projected long-range growth rate for Benton County was an important part of being able to develop relevant long-range Land Use Plan Maps. The Washington Office of Financial Management (OFM),

which is responsible for the State's official population projections by county, has recently projected a population of 162,245 for Benton County by the year 2000. This represents substantial growth, and the recognition of a high projected growth rate was one of the important factors taken into consideration as the Plan maps were developed.

5. Affected Agency Review - In the summer of 1979 the Planning Department conducted an affected agency coordination program that consisted of meetings and communications with officials of the County's cities and other affected public and semi-public agencies. The purpose of this program was to facilitate coordination of the County Plan proposals with plans, policies, and programs of those agencies that would be affected by the County's Plan. The result of this effort was a number of suggestions and comments that were incorporated into the draft Plan maps to ensure that potential conflicts with the plans of these agencies were minimized to the extent possible.

6. Environmental Impact Statement - In August of 1980 a 177 page environmental impact statement (EIS) was completed for the Draft Comprehensive Plan. This document provided a detailed analysis of the environmental impacts that could be anticipated if the Draft Plan were adopted as written. In addition, this EIS process provided an opportunity for additional input by affected agencies and citizens at large, providing yet another opportunity for review and refinement of the Plan maps.

7. Existing Land Use - Existing land use within the County was inventoried and mapped as a part of the resource inventory described earlier. During the Plan determination process, existing land use patterns and trends were recognized as one of the most influential factors upon future land uses. Consequently this factor was given careful consideration during the development of the Plan Maps.

8. Transportation Network - The location of transportation facilities (both existing and proposed) was a consideration of substantial importance in developing the draft Plan maps. This factor is especially important for Benton County due to the existing and planned I-82 and I-182 freeway routes. The location of these freeways and their interchanges will have substantial impacts upon adjacent land use patterns. Consequently, these and other transportation factors were given careful consideration as the Land Use Plan Maps were developed.

9. Long-Range Land Use Needs Analysis - Projections of anticipated long-range land use acreage needs by use have been calculated. Although by no means absolute, these estimates have yielded some "ballpark" parameters that enable the County to ensure that enough land is being planned for various uses based upon several assumptions. These long-range needs estimates in many cases were based upon the long-range needs estimates included in each Plan Element (Housing, Transportation, etc.), and in this regard the Land Use Element and maps can be considered to be a synthesis and culmination of all the proceeding Elements.

10. Standard Planning Principles - Where helpful and/or necessary to the resolution of the planned designation for an area, standard planning principles such as compatibility of uses and buffering techniques were applied. Although often not specifically called out, this type of criteria was utilized throughout the Plan map determination process.

As mentioned, the Land Use Plan Maps are a synthesis and culmination of the factors outlined above and of the entire Plan development process as it has occurred over the past four years. As such, the results of this process are portrayed graphically on pages 139-144 and are described below:

Land Use Plan Map Classifications

The following is provided to assist in interpreting the Land Use Plan Map classifications. These designated uses are shown on the maps on pages 139-144. The Countywide map presents the planned land use patterns at a somewhat generalized scale for all areas of the County outside of the urban growth boundaries. The five planning region maps present the planned land use patterns at a more detailed scale for what have been identified as the developing areas of the County.

Land use classifications and terms utilized in the Plan are:exclusive agriculture; general agriculture; rural residential; low, medium, and high density residential; neighborhood commercial; interchange commercial; general commercial; light industrial; heavy industrial; public; Hanford Reservation; urban growth boundary; mineral and aggregate resources; and semi-public facility. Further separation of uses within each Plan classification can be made by zoning maps and related ordinance provisions provided such zoning provisions are not less restrictive than the Plan classifications to which they relate. The definition, purpose, and location of each land use classification is provided below.

Exclusive Agriculture (EA)

Definition and Purpose:

The Exclusive Agriculture designation is primarily designed to encourage the maintenance and enhancement of agricultural production on those lands within the County that are best suited for this use. In addition, as the most restrictive use, this classification is applied to some areas that are primarily devoted to wildlife habitat, as well as to areas that are considered to be essentially unbuildable due to such factors as excessive slope and severe flood hazard. As such, the exclusive agriculture designation is intended to protect agricultural lands from the encroachment of incompatible uses, to protect valuable wildlife habitat areas, and to maintain the open space character of lands which due to a variety of factors such as excessive slope, inaccessibility, and flood hazard characteristics are not suited for intensive land development.

As a result of Benton County's phenomenal growth, the continued vitality of the agricultural element of the County's economy is threatened by the encroachment of incompatible uses upon agricultural lands. The County's good agricultural lands should be afforded protection from this threat in light of their importance to the local economic base. In order to accomplish the purpose of having an agricultural designation, this land use classification will have a maximum allowed density of one dwelling unit per 20 acres with exceptions to the density requirement for uses which are either an integral part of the agricultural economy and thus are appropriately located in agricultural areas, and/or uses which are compatible with exclusive agricultural use. In fact, for some of these uses it will be desirable to have the lot size as small a possible in order to minimize the amount of agricultural land that is taken out of production. Examples of the kinds of activities and uses for which it is intended that exceptions to the density requirements will be permitted (outright or conditionally) are dwelling units for immediate family members; dwelling units for farm employees; retirement of a farmer in his existing home and sale of the remainder of the farm for agricultural purposes; limited individual homesites on nonproductive land; guest houses; grain elevators; livestock sales and feed yards; agricultural product storage, processing, and packing facilities; grange halls; veterinary animal hospitals (large animal); personal use airports; schools; churches; and "roadside stand" type agricultural product sales for products grown locally. A list of uses such as this usually is reserved for the zoning ordinance, and indeed as the Benton County Zoning Ordinance is revised upon adoption of the Comprehensive Plan, a more detailed and inclusive list than the preceding will be developed. However in light of the importance of a complete presentation to the people of the County of the real meaning and effect of the exclusive agricultural classification, it was felt that their inclusion at this point was important.

The plan does recognize the potential for development of lands classified Exclusive Agriculture that border on areas designated for urban densities. These lands can be considered for future development on a case by case basis provided that the infilling of the existing urban areas has been considered first.

Location:

Virtually all of the lands falling outside the borders of the planning regions, exclusive of the Hanford Reservation, are designated for exclusive agricultural use. Exceptions include the public designations of Hover Park southeast of Finley, Crow Butte State Park west of Paterson, and lands along the Columbia River under federal ownership and managed for their fish and wildlife habitat.

HORSE HEAVEN HILLS

Most of the Horse Heaven Hills area and all of the Rattlesnake Hills are included in this classification. The Clodfelter Road area was considered for an agricultural designation; however the parceling and development activity taking place in this vicinity warranted a rural residential designation.

RATTLESNAKE HILLS

LOWER YAKIMA VALLEY

In the Rattlesnake Hills area, the designation encompasses all of the lands outside the Hanford Reservation from the north county line extending south in include much of the lower Yakima Valley. The southern boundary roughly corresponds to the Roza Irrigation District Canal in the Benton City Region and the southern terminus of those lands containing primarily classes I-IV soils in the Prosser/Roza Region.

These lands were selected for the exclusive agricultural designation because of their suitability for agricultural activities and wildlife production as evidenced by (1) existing uses of irrigated and dryland cropping and livestock grazing; (2) relatively large lot sizes (Virtually all over 20 acres); (3) occurrence of important farmlands (prime and unique farmlands and farmlands of statewide importance as defined by the U.S.D.A. Soil Conservation Service); (4) grass and sagebrush habitats inland from the Columbia River Reservoirs and wetland habitat along the Columbia River; and (5) their distance from urban

activities.

General Agriculture (GA)

Definition and Purpose:

The General Agriculture classification designates areas that are desirable for agricultural activities and rural living opportunities. The primary purposes of the classification are to conserve those agricultural lands which may at some time in the future be converted to other uses, to provide a buffer between agricultural and urban or suburban areas and to maintain the rural character of the County. Although such parcels may be smaller than what is considered to be an economic farm unit, the total contribution of this classification to the economy of the County is significant when such acreages are under intensive irrigated agricultural use. As in the case of exclusive agricultural areas, introduction of non-farm uses into General Agricultural areas may have adverse impacts upon farming activities. Non-farm uses which are incompatible with farming operations should not be allowed. Maximum density in areas designated as General Agriculture shall be one dwelling unit per 10 acres.

Location:

All of the lands designated general agriculture are located within the planning regions and are indicated on the Benton City/Kiona, Prosser/Roza and Richland/West Richland regional plan maps, as well as the countywide plan map. As shown on the countywide plan map, these lands are located in the following areas.

EAST WHITSTRAN NORTHWEST BENTON CITY — Lands east of Whitstran and west of Benton City and adjacent to the Yakima River and extending north to include lands south of the Roza and Sunnyside Canals compose an area characterized primarily by irrigated agricultural activities including orchard, vineyard and pasture lands, and are designated as general agriculture. This area was considered for both exclusive agriculture as well as rural residential use. The general agriculture classification was designated for the following reasons: (1) soils capabilities for growing crops are generally not as high as those irrigated lands designated for exclusive agriculture use; (2) average ownership sizes and recent parceling activity does not warrant a density requirement more restrictive than 10 acres; (3) existing land use of primarily orchard, vineyard, and pasture land does not warrant a rural residential designation; and (4) access south of the Yakima River has not been established to accommodate development of small acreage sized lots.

HOVER — The area south and east of the intersection of Hover and Meals Yellipit Roads running to the top of the ridge and along the west side of Hover Park is identified as General Agriculture. This designation provides a buffer to the Hover area and Hover Park.

RICHLAND FLOOD PLAIN — Two isolated areas of general agriculture designation are located west of the City of Richland. These are primarily low-lying flood-prone wetlands used for pasture and waterfowl hunting area. It is unlikely that physical or environmental changes will occur in this area to warrant conversion to other uses in the foreseeable future.

RED MOUNTAIN — An area of approximately 3,000 acres in the vicinity of Red Mountain has been designated general agriculture. This is a developing agricultural area. Existing land use includes productive commercial vineyards.

Rural Residential (RR-5) (RR-1)

Definition and Purpose:

Areas having maximum allowed densities of one dwelling unit per 5 acres and one dwelling unit per 1 acre, and used to provide land suitable and desirable for small acreage residential parcels, farms, ranchettes, and other uses that can be developed in harmony with both urban uses and agricultural activities. The primary purposes of this classification are to accommodate demands of non-farm families and hobby farmers for rural living, to provide a buffer between urban uses and agricultural activities and, in those areas so identified and in close proximity to urban areas and services, to conserve lands potentially suitable and desirable for future urban expansion.

Location:

As with the general agricultural classification, all of the lands designated for Rural Residential use are located within the developing regions and are delineated on Benton

City/Kiona, Kennewick/Finley, Paterson/Plymouth, Prosser/Roza and Richland/West Richland regional plan maps. The rural residential designations delineated in the Paterson/Plymouth planning region describe one acre minimum, while in the Benton City/Kiona, Prosser/Roza, Kennewick/Finley, and Richland/West Richland planning regions, both one and five acre minimum designations are identified.

Five Acre Rural Residential (RR-5)

SOUTH FINLEY
PROSSER

The rural residential - five acre designation in the area south of Finley encompasses farmlands served by the Kennewick Irrigation District Division Four Canal. Virtually all of this area is under various agricultural crop production and contains relatively good soils (primarily capability classes II-IV) and is relatively undeveloped. In the Prosser area, the five acre designation encompasses lands characterized by capability classes II-IV and VI soils. However, in some areas the soils are shallow where bedrock is close to ground surface. During the irrigation season, these soils become saturated, the water table rises and ponding off of water or "subbing" occurs. This man-induced condition restricts the functional capability of on-site waste disposal (septic) systems in the area, making it unsuited for a lower minimum acreage size designation which would allow greater density developments. Additionally, the existing land use of irrigated agricultural activities, particularly vineyard and orchard crops, makes the five acre designation attractive as it affords greater protection to such activities than does the one acre classification. Consideration was given to designating the area general agriculture, but the current ownership pattern in the area (many less than 10-acre lot sizes) precluded that designation.

GOOSE HILL
BADGER LATERAL

North of Badger Canyon a large expanse of land is designated Rural Residential - Five Acre, in general encompassing the area between the Badger Lateral Canal and proposed Interstate 82 and extending northwest to include Goose Hill.

BENTON CITY

The areas designated as Rural Residential-Five Acre to the west and northwest of Benton City were originally designated as General Agriculture and Rural Residential-one Acre in the Preliminary Draft of the Comprehensive Plan. Due primarily to the existing development pattern, concerns brought out at public hearings, and agricultural capability classifications of the soils involved, the designation was changed to Rural Residential-Five Acre.

AMON CANYON

The Rural Residential-Five Acre designation has been applied to the Amon Canyon region primarily because that area is enveloped by urbanization or urban designations on the north, east, and west.

SOUTHEAST

Several Rural Residential-Five Acre designations have been applied to areas along the Columbia Irrigation District's Canal No. 3. These areas have been identified by a consulting geologist as being subject to flash flooding. In at least one case the State Department of Ecology has confirmed these findings. Partially in recognition of these hazards, City of Kennewick and Benton Franklin Governmental Conference comprehensive plan maps have consistently shown these areas as "open space". By utilizing a Rural Residential-Five Acre designation, the County will not be precluding all development opportunities, but will be providing a measure of protection to the public health and safety by maintaining these hazard areas in a more rural, less intensive type of development.

One Acre Rural Residential (RR-1)

The one acre maximum density rural residential classification is designated in all five planning regions. Such lands were so designated based primarily on current development activity characteristic of small acreage residential uses.

Location:

NORTH PROSSER

In the Prosser/Roza planning region three isolated areas are identified. The largest, located immediately north and west of Prosser, is bounded by the Yakima River to the south, Missimer Road to the west, the Burlington Northern Railroad tracks to the north and Old Inland Empire Highway to the east. Much of this area is presently developed in small acreage lots (less than ten acres).

EAST PROSSER

The area designated with this classification immediately east of Prosser is an "island" created by the construction of Interstate 82 which serves as its

southern and eastern boundaries, and existing old State Route 12 (now the Prosser Industrial Park access road) to the north. Parcel sizes are almost exclusively in the 1-10 acre size range. The area's proximity to the industrial park makes it unsuited for urban residential use.

WHITSTRAN

In the Whitstran vicinity is located the remaining one acre residential designation found in the Prosser/Roza planning region. This area is currently characterized by small acreage rural residential development. The intent of identifying this area with this land use classification is to encourage the protection and perpetuation of the rural character of the Whitstran community.

Within the Benton City/Kiona region and extending into the Richland/West Richland region along Ruppert Road and Badger Canyon, are lands designated with this classification. Although contiguous, four geographical areas can be recognized: (1) that portion of the lower Yakima Valley immediately west and north of Benton City's urban growth boundary; (2) the highlands immediately east of Benton City; (3) the base of the north slope of Red Mountain, and (4) Badger Canyon.

BENTON CITY

Although much of the valley land near Benton City within this classification is characterized by irrigated agricultural use, a great deal of this land has been broken into small acreage lots with rural residences making the present character of the area rural residential, hence, warranting this designation. The highlands across the Yakima River sit approximately two hundred feet above the town site and are recognized in the plan as having the potential for urbanization when city services are established in the area. This area has been experiencing sporadic

RED MOUNTAIN

subdivision activity. The base of the north slope of Red Mountain extending to and along Ruppert Road to the north is presently characterized by small acreage residential development, as is much of the Badger Canyon area, particularly east

BADGER CANYON

of the Badger railroad siding. West of the Badger siding, exclusive of the development associated with the Kiona community, parcel sizes are relatively large (primarily over ten acres) and agricultural activities are present. Much of the Badger Canyon area contains capability class I soils. Possible future uses identified include a public park east of Kiona.

THE HORN

The area known as the "Horn" northwest of the City of West Richland contains soils that are relatively poor for agricultural purposes. Providing the area with a Rural Residential One Acre designation brings it into conformity with the remainder of the rural residential designations in the area. In addition, most of the entire area is covered by a single ownership which has maintained a master plan on file with the County for over 10 years indicating residential development of the area to one acre lot sizes. Over the years the County has granted subdivision approval to three units of the total development which could be viewed as phases of the total private master plan for the area.

WEST RICHLAND FLOOD PLAIN

In the Richland/West Richland planning region several one acre rural residential areas are designated, three of which are within the urban growth boundaries of Richland and West Richland. Two such designations are within West Richland's urban growth boundary and consist of flood prone lands associated with the Yakima River flood plain (see the environmentally sensitive areas maps in Chapter IV). The Plan recognizes the potential for the urbanization of those lands immediately north of West Richland provided demand warrants and the flood hazards associated with such developments are adequately mitigated.

EL RANCHO REATA

Within the Richland urban growth boundary, the area immediately north of the proposed Interstate 82 is designated one acre rural residential. The eastern portion of this area is the site of the El Rancho Reata subdivision consisting of small acreage homesites. The remaining portion of the area is anticipated for similar development. At the western edge of the designation the Plan recognizes the potential for commercial activity when development in the surrounding area so warrants.

HARRINGTON ROAD

Two areas outside the urban growth boundaries of West Richland and Richland are included within this classification and are located (1) along Harrington Road north of West Richland and (2) along Weidle Road adjacent to the west side of

WEIDLE ROAD

Horn Rapids irrigation ditch at the Richland city limits. The lands associated with Harrington Road are predominantly characterized by small acreage lot sizes and rural residences. The latter area is currently the site of a cluster of mobile home units on acreage size lots, although most of the area is currently undeveloped.

HOVER

Some three and one-half miles southeast of the vicinity of the Finley School, an

area of approximately 600 acres has been designated as RR-1. Some of the factors involved in this decision include the general unsuitability of the area for agricultural production, existing residential development, existing parcel sizes, and the proximity of the area to the proposed industrial area immediately to the east.

KENNEWICK — An area of some two hundred acres along West 10th Avenue between South Union Street and South Kellogg Street has been designated as RR-1 due to existing development patterns and concerns expressed by the City of Kennewick. The City's major concerns centered around planning the area for development pattern that would be compatible with the City's long-range plans for the area.

FINLEY — The Finley area contains a large block of the one acre rural residential classification as shown on the Kennewick/Finley regional plan map. Exclusive of the community of Finley, Two Rivers Park and the industrial area along the Columbia River to the east, all of the lands north of Columbia Irrigation District Canal Number 3 and east of Havana and Dague Roads are encompassed within the classification. The area is presently characterized by small acreage rural residential development interspersed with irrigated agricultural activities. Existing residences in the area rely exclusively on wells for domestic water supplies and most tap a shallow aquifer. The shallow depth to ground water poses a potential for ground water pollution from irrigation water run-off, urban and farm wastes and septic tank effluent. In cases where such problems have been experienced, deeper wells have had to be dug, tapping aquifers below the basalt upon which the shallow aquifer rests. In order to minimize problems associated with ground water contamination and to protect the rural character of the Finley area, the area was designated with the one-acre rural residential classification. A larger acreage minimum would be out of character with the current use of the area as would the allowance of city lot sizes. In addition, urban-type developments within the area could create water contamination problems discussed above.

PATERSON — Two areas are identified for one acre rural residential development in the Paterson/Plymouth planning region and both are located at Paterson at the western and eastern ends of the community. Both are bordered to the north by the Bonneville Power Administration power transmission lines and associated right-of-way. The designated areas are currently undeveloped.

Residential

Definition and Purpose:

Areas recognized as urban or having the potential of urbanization within the foreseeable future and used to provide land suitable and desirable for residential living. Three categories of residential classifications are defined.

1. Low Density (LDR): One to three dwelling units per gross acre.
2. Medium Density (MDR): Three to six dwelling units per gross acre.
3. High Density (HDR): Six to 16 dwelling units per gross acre.

The purposes of these three classifications are to identify those lands which are anticipated to be used for satisfying the future residential housing needs of present and potential incorporated cities and towns and to protect such areas from premature development which may be incompatible with the desired future and/or existing residential character of such areas. Designation of planned residential densities is important in the fringe areas of urban centers because planning for transportation needs, municipal water and sewer services, school facility needs, fire protection needs and other capital improvement needs is contingent upon knowing the future population densities of the areas to be served. Because premature residential development in rural areas is incompatible with rural living and farming operations and practices, low, medium and high density residential uses shall not be designated outside urban growth boundaries, except within or adjacent to the unincorporated communities of Finley, Kiona, Paterson, Plymouth and Whitstran.

Determination of the suitability of lands for the various categories of residential use was based upon the following factors: (1) existing land use; (2) ownership patterns; (3) average ground slope conditions; (4) location of environmentally sensitive areas (see Chapter IV); (5)

distance from urban centers; and (6) occurrence of preliminary subdivision activity.

Determination of desirability was based upon citizen concerns and city and agency input. An attempt was made to designate classifications which will facilitate incorporation of these lands into the cities either prior to or subsequent to their development.

Low Density Residential (LDR)

The most restrictive of the three classifications of residential use is the low density residential classification. This classification provides for residential developments of no greater density than three units per gross acre. Unlike the medium and high density residential categories, whose allowed density would require community water and waste treatment systems for developments constructed at the higher density levels, the low density residential classification provides for areas to develop at urban densities without the availability of municipal or community waste treatment facilities (provided adequate on-site conditions warrant such development). This allows the smaller communities to expand at urban densities prior to the establishment of municipal services and also allows infilling in bypassed urban areas where municipal services may not yet be established. Most importantly, the low density classification provides protection to existing and future developments desiring to maintain a low density character. Low density residential designations are found in the Benton City, Finley, Kiona, Paterson, Prosser, Kennewick, Richland, and West Richland vicinities.

Location:

BENTON CITY — Generally, the area adjacent to the Benton City city limits is designated low density residential. This designation extends west to Whan Road and north to Corral Creek Road. The Yakima River borders the designation at the south and river road on the east. This area is currently developing consistent with the definition of this classification; and there are sufficient undeveloped tracts within the area to sustain the urban expansion of the city for many years.

KIONA — Across the Yakima River from Benton City and immediately south of State Route 12 is the unincorporated community of Kiona. The present platted townsite of this community is the only area encompassed within this designation. As the potential for development of municipal water and sewer service is not forseen, a less restrictive residential designation is not warranted.

FINLEY — The low density residential designation for the Finley community was made for reasons similar to those found in Kiona. Municipal services are currently not established in this unincorporated community so as to warrant allowance of higher density development.

PATERSON — At Paterson, the low density residential classification is designated east of the commercial area associated with State Route 221 and extends to include the present residential area north of State Route 14 extending south to include the area between State Route 14 and Paterson Road. Although currently undeveloped, the area south of the highway is part of the platted portion of the townsite as it existed prior to the construction of the John Day Dam. Most of the development north of the highway resulted from the community's relocation, which occurred when much of the original townsite was inundated by the formation of Lake Umatilla.

PROSSER — The low density residential classification in the Prosser vicinity is designated west, north and east of the townsite. Interstate 82 forms a physical boundary to the east and north. South of the Yakima River at the western edge of town, all of the lands east of Ward Gap Road bordered by the river to the north and extending approximately 3,000 feet to the south are included within this classification. The area is relatively undeveloped. The large lot ownership pattern (mostly in the 5-20 acre parcel size category) and relatively flat relief, make this area especially well suited for urban residential use. East of town, between the city limits and Interstate 82, in the vicinity of Hillview Mobile Home Park, is the only other block of low density residential designation south of the Yakima River. All other lands so designated are located north of the river, bordered by Interstate 82 to the north and the city limits to the west. These lands north of the river are currently characterized by rural residential development with ownerships primarily in the 10-40 acre parcel size category. The plan recognizes the potential for medium density residential development in this area provided demand warrants and adequate sewer and water services are established to accommodate the higher density development.

KENNEWICK — In the east Kennewick vicinity, low density residential is designated west of Havana and Dague Roads and extending in a southwesterly direction to the general vicinity of South Olympia Street and the Kennewick Irrigation District Division Four Canal. In the West Highlands area lands associated with Tenth Avenue are designated low density residential in the vicinity of the medium density residential designations in this area. An additional area designated low density residential is found in the area generally referred to as "Tri-City Heights" located south of Highway 12 and north of West Canal Drive.

RICHLAND — The largest contiguous block of land designated low density residential is located within Richland's urban growth boundary. Excluding the rural residential area in the vicinity of El Rancho Reata Subdivision, the unincorporated "island" designated medium density residential for the most part, and lands designated for public use north of the intersection of State Route 12 with the tracks of the Union Pacific Railroad; the majority of lands within the City of Richland's urban growth boundary are designated low density residential. Much of the land south of State Route 12 is identified as environmentally sensitive due to the steep

BADGER MOUNTAIN — slopes associated with Candy and Badger Mountains (see maps delineating environmentally sensitive areas in Chapter IV). The area south of State Route 12 is virtually undeveloped with the exception of scattered residences on acreage-size lots and irrigation activities below the Badger Lateral Canal. Much of the south slope of Badger Mountain is developed with centerpivot irrigation systems. Although agricultural activities are prevalent, much of the area on the south slope has received preliminary plat approval for lots of less than one acre in size. Although not yet platted, a substantial portion of the area in the vicinity of State Route 12 is expected to develop at urban residential densities in the foreseeable future. This low density residential designation continues along to the Kennewick city limits in the vicinity of State Route 14.

SOUTH RICHLAND — Within the "island" area discussed previously, surrounded by the corporate limits of Richland, are lands characterized by steep slopes not well suited for medium density residential development. Such lands are included within the low density classification.

The Plan recognizes the potential for future public use of school facilities and grounds in the Badger Mountain and Goose Gap vicinities. At such time as sufficient development occurs in the area to warrant acquisition of lands for school facilities, the plan map should be amended to identify those properties acquired.

WEST RICHLAND — In the West Richland vicinity, within West Richland's urban growth boundary, the low density residential classification is generally designated in areas with average slopes greater than 8%. Such lands occur along the ridge system associated with Flat Top Hill running west and southeast of town.

ENVIRONMENTALLY SENSITIVE AREAS — As revealed in the above descriptions of lands designated for residential use, there are lands which may be unsuited for urban residential development because of steep slopes or other hazardous conditions. Where such conditions are prevalent and identified as environmentally sensitive, the areas have been designated low density residential. The plan recognizes the hazards involved in developing such areas and stipulates that appropriate studies and/or environmental impact statements be prepared prior to development to identify mitigating measures.

Medium Density Residential (MDR)

Location:

The medium density residential classification has a maximum allowed development density of six units per gross acre. Lands designated with this classification are located in the Kennewick, Plymouth, Richland, and West Richland vicinities and are shown on the Kennewick/Finley, Paterson/Plymouth, and Richland/West Richland regional land use plan maps.

KENNEWICK — In the Kennewick vicinity, lands designated medium density residential are currently characterized by a patchwork of residential developments whose densities are consistent with this classification. Among these developments are many open tracts suitable for similar development. The designation encompasses lands south of 10th Avenue and north of 45th Avenue between South Ely Street and the South Washington Street alignment. Also encompassed are the extensively developed residential areas in the vicinity of Clearwater Avenue. The vicinity of Tenth Avenue and Union Street extending east is also included within this

classification. The designation has also been given to the 870 acre Locust Grove planned unit development southwest of Kennewick.

WEST RICHLAND — Three areas within the West Richland urban growth boundary are designated medium density residential. Lands so designated are largely undeveloped at the present time, but are included within the potential service capability of West Richland's planned improvement of the city's sewage treatment facilities.

PLYMOUTH — Medium density residential development in the Plymouth vicinity is designated for all lands south of State Route 14 extended east to the proposed location of Interstate 82, and west approximately one mile from the intersection of State Routes 14 and 143, bounded at the south by the east-west line of (and extending east from) the northern boundary of the high density and light industrial designations. These lands are currently undeveloped, with the exception of railroad facilities south of the tracks and immediately west of State Route 143. The Burlington Northern Railroad and Bonneville Power Administration rights-of-way traverse the area, encompassing approximately one-third of total land area designated.

SOUTH RICHLAND — In the Richland vicinity of State Route 12, located between Keene Road and the Yakima River, is an "island" of unincorporated land completely surrounded by the City of Richland. That portion of the area characterized by relatively mild relief (average slopes primarily less than 8%) is designated medium density residential. The balance of the area is included within the low density residential and public classifications. It is only a matter of time before this area is completely incorporated by Richland. The area is currently characterized by open space, mobile home park, and scattered rural and urban residential uses.

High Density Residential (HDR)

Location:

High density residential is the least restrictive residential classification, allowing up to sixteen dwelling units to be developed per gross acre of land. The classification is shown designated on the Kennewick/Finley and Paterson/Plymouth regional land use plan maps. All of these lands are characterized by relatively flat relief and are either surrounded by, adjacent to, or within urban areas.

PATERSON — In the Paterson area, the high density residential designation is located west of State Route 221 extending east from the school grounds to the commercial area associated with the highway. This land is presently undeveloped and would be suited for high density residential use provided adequate sewer and water services could be provided.

PLYMOUTH — In the Plymouth vicinity, development of the community is impeded from advancing north by the locations of the Burlington Northern Railroad tracks, the Bonneville Power Administration transmission lines and State Route 14. The Columbia River effectively limits growth from extending further south. As a consequence of these north-south restrictions, contiguous urban development in Plymouth can only locate to the west and east. Construction of Interstate 82 and the elevated grade associated with the Columbia River bridge connection serves as a growth barrier to the east. Given these physical restrictions, the desirability of the undeveloped lands west of Plymouth for high density residential use is clearly established. The prevailing southwesterly winds associated with the Columbia River Gorge make lands west of town undesirable and unsuited for heavy industrial development.

LEAPFROG DEVELOPMENT — The Plan recognizes that areas designated for high and medium density residential uses can only develop at such densities when adequate community sewer and water facilities are established to serve such densities. The Plan also strongly encourages the location of urban density residential activities adjacent to existing urban development. Plan policy discourages leapfrog developments within the various residential designations. In-filling of vacant lands or isolated agricultural lands formed by existing leapfrog developments and designated residential on the plan maps will be encouraged to develop prior to other lands designated for urban residential uses.

Neighborhood Commercial (NC)

Definition and Purpose:

Areas primarily used to provide land suitable and desirable for those retail commercial activities serving local neighborhood trade areas. Since the primary purpose of this classification is to provide convenience shopping to residents living nearby, development within such areas should be designed to blend into the character of the local neighborhood and not be incompatible with residential living.

As both urban and rural residential areas develop and expand, the need is generated for retail establishments to be located within a few minutes driving or walking distance to supply the day-to-day necessities and convenience goods and services demanded by neighborhood residents. In protecting local character and neighborhood livability, it is important to exclude those types of activities which have the potential of becoming generators of community and regional traffic.

It is important that the size of the neighborhood commercial designations be kept to a minimum. In rural areas, the designations should encompass only lands immediately adjacent to arterial intersections. Within urban growth boundaries, standards set by the respective cities should be used as the guide when determining the extent of such designations.

Location: Because of the size and the variability of need and locations for neighborhood commercial uses no pre-determined or existing locations have been identified on the Land Use Plan Maps of this document. Instead, upon implementation of this plan, existing neighborhood commercial uses will be delineated through the zoning maps and from that point on proposed neighborhood commercial uses will be considered through petition for a zone change on a case by case basis.

Community Commercial (CC)

Definition and Purpose:

Areas primarily used to provide land suitable and desirable for those retail commercial activities specifically serving local community trade areas. Development within this classification shall be concentrated in centrally located areas designed to allow adequate accessibility and parking facilities.

It is important that the size of community commercial designations be kept to a minimum and that the type of activities allowed to locate within this designation do not become generators of regional traffic.

Location:

PROSSER Areas designated neighborhood commercial are located within the Kennewick, Prosser, Finley, West Richland and Whitstran vicinities. In the Kennewick vicinity, the neighborhood commercial designation is located at the intersection of 27th Avenue and South Washington Street. This intersection is presently committed to commercial use. In the Prosser/Roza planning region the

FINLEY neighborhood commercial is located at the intersection of State Highways 22 and 221. In Finley, the designation includes the area immediately east and south of

WEST RICHLAND the intersection of Finley and Game Farm Roads. In the West Richland vicinity, the area adjacent to the intersection of Canal Drive and Ranch Road is

WHITSTRAN designated. And in Whitstran, the designation encompasses the area immediately east of the intersection of Old Inland Empire Highway and Rothrock Road. Both the Finley and Whitstran designations contain existing neighborhood commercial establishments. The site designated in the West Richland vicinity is currently developed with residences north of Canal Drive and undeveloped to the south between Grosscup Road and the Columbia Canal.

Interchange Commercial (IC)

Definition and Purpose:

Areas used to provide land suitable and desirable for only those highway oriented commercial activities serving interstate highway traffic. Development within this classification shall be concentrated to the extent possible with adequate access and parking areas to maximize convenience while minimizing congestion. Signs associated with such areas shall be regulated so that they are not distractive to the users of the interstate highway system nor a detriment to commercial activities.

Location: Seven areas are designated interchange commercial along the existing and proposed portions of Interstate 82 and Interstate 182 as follows: (1) West Prosser, (2)

Benton City, (3) I-82 to I-182 interchange, (4) S. R. 12, (5) Badger Road, (6) S. R. 14 and (7) Plymouth.

General Commercial (GC)

Definition and Purpose:

Areas recognized as urban or having the potential for urbanization within the foreseeable future and primarily used to provide land suitable and desirable for those wholesale and retail commercial activities serving regional and community trade areas. Development within such areas should be concentrated to the extent possible to maximize utilization of utility services and customer interaction among establishments located therein.

Generally, the most desirable location for regional and community commercial activities is within the central portions of cities and communities where accessibility to surrounding market areas can be maximized. In this respect, the central cities or communities are and should be the primary providers of lands for such commercial uses. The desirability or attractiveness of a community or city for satisfying customer demand for goods and services largely depends upon the convenience the commercial areas offer. Generally, the more spread out and isolated the individual commercial establishments are, the less convenient and desirable the city or community commercial function.

The Plan recognizes the importance of maintaining and perpetuating regional and community commercial activities within the existing cities and communities. The general commercial classification is designated within or adjacent to commercial development unless the need for the development of isolated commercial areas is warranted. Those rural communities which have the potential for eventual incorporation may also include lands within this classification in order to establish viable commercial centers as the communities grow. Areas designated general commercial are located in the Kennewick, Paterson, Plymouth, Prosser and Richland vicinities and are displayed on the Kennewick/Finley, Paterson/Plymouth, Prosser/Roza and Richland/West Richland regional land use plan maps.

Location:

KENNEWICK — Several isolated areas are identified with the general commercial designation in the Kennewick vicinity and are all partially developed with regional and/or community commercial activities. All of these areas are associated with the existing commercial developments along Clearwater Avenue and Edison Street. One such area is located at the northwest corner of the intersection of these two streets, extending north along the west side of Edison to the Burlington Northern Railroad right-of-way. The largest of the commercial designations encompasses lands adjacent to Clearwater between Edison and Neel Streets. This area is currently characterized by strip commercial development. On the south side of Clearwater an area is designated west of McKinley Street which is adjacent to the strip commercial activities currently developing in the city to the west. The area between the three above designations located along Clearwater is characterized by single and multi-family residential development. These residential areas should be protected from encroachment of further strip commercial activities. The remaining general commercial designation encompasses the vicinity of the intersection of Edison Street with Canal Drive. Present development in this area is characterized by community commercial, public and residential uses.

WEST KENNEWICK — At the intersection of Badger and Clodfelter Roads and Clearwater and Tenth Avenues, general commercial land is designated within both the Richland and Kennewick urban growth boundaries. Although this area is relatively undeveloped, central access, recent commercial development in the area, and developing residential activities in the general vicinity warrant the general commercial designation.

FINLEY — Two general commercial areas are designated in the Finley area at the intersection of Perkins, Haney and Chemical Roads and at the intersection of Chemical and Bowles Road. These designations recognize existing commercial development in these areas, as well as the conduciveness of these major intersections to commercial use. The general commercial designations are centrally located in the rapidly developing residential area between Kennewick and Finley and would be a logical location for the provision of commercial services for this area.

PROSSER — In the Prosser vicinity, along both sides of State Route 12 northwest of town, there are two areas of the General Commercial designation. This area is

presently characterized by scattered commercial and light industrial activities, primarily of the type which requires large land area. The City of Prosser has one of the most convenient, consolidated "downtown" commercial centers in the Central Washington area. However, land is not readily available within the city center to accommodate those types of commercial activities which demand large acreages for product display and/or storage. The lands designated general commercial along State Route 12 are ideally suited for providing land for such commercial activities and hence warrant the general commercial designation. Commercial activities locating within this designation should only be of the display and storage of retail and wholesale goods. Other types of commercial activities should be encouraged to locate within Prosser's downtown commercial center. Most of the above-described area was annexed by the City of Prosser in February, 1980. There is also an area of general commercial designation just east of the east Prosser interchange of I-82.

PATERSON AND PLYMOUTH — Both Paterson and Plymouth include lands within the general commercial classification. Since these are small, isolated communities with potential for eventual development, the need exists for establishing areas to serve as the future central business district of each community. Lands designated encompass the vicinities of the intersections of State Routes 221 and 143 with State Route 14 in Paterson and Plymouth respectively. These areas presently include all of the commercial activities located in these two communities.

Light Industrial (LI)

Definition and Purpose:

Areas used to provide land suitable and desirable for those industrial activities which help maintain the County's economy and employment and which do not create objectionable conditions (noise, smoke, odor, etc.) to urban activities. The primary purpose of this classification is to encourage those industrial activities which are compatible with urban activities to locate near the labor force while maximizing use of transportation facilities and available urban services. Uses which are incompatible with urban activities will not be allowed.

Since light industrial activities are, by definition, compatible with urban uses, the need to encourage such activities to locate away from and downwind of urban areas is not of major concern. Primary concerns in designating light industrial areas are the following: (1) nearness to urban populations and utilities; (2) availability of large acreage ownerships of open space lands or lands currently used by light industrial activities; (3) availability of various transportation facilities; and (4) topographically suitable lands of flat relief.

Location:

Lands included within the light industrial classification are designated in the vicinities of Benton City, Paterson, Plymouth, Prosser, Richland, West Richland and Whitstran and are delineated on the Benton City/Kiona, Paterson/
Plymouth, Prosser/Roza and Richland/West Richland regional land use plan maps.

BENTON CITY — In the Benton City vicinity, the light industrial classification includes agricultural lands adjacent to the city and the Yakima River to the east and south respectively. The designation extends less than one-half mile west of town and encompasses lands adjacent to both sides of the Union Pacific Railroad tracks. Although no industrial activities are currently located within the area, a portion of the property is owned by the Port of Benton for industrial park use.

HOVER — The area through Goose Cap along Meals Yellipit Road is identified as light industrial.

PATERSON — At Paterson the designation encompasses lands extending approximately one mile west of the commercial area designated at the intersection of State Routes 14 and 221 and is bordered to the north and south by State Route 14 and the Burlington Northern Railroad right-of-way respectively.

PLYMOUTH — The light industrial designation encompasses the western half of the island upon which a portion of Plymouth Park is developed.

PROSSER — A light industrial designation is located approximately one mile northwest of Prosser at the southeast corner of Wilgus Road and Old State Route 12. The site encompasses approximately 240 acres and is characterized by existing and proposed light industrial uses, and existing pasture land.

RICHLAND — Within the northern portion of the City of Richland is an "island" of unincorporated land. The area is currently undeveloped. Industrial development exists within the city in the area immediately east of the site.

WEST RICHLAND — An area of approximately 210 acres has been designated light industrial west of the City of West Richland where State Route 224 crosses the West Richland urban growth boundary. There is an existing auto race track in the area as well as major highway and railroad access. Testimony provided at public hearings has indicated an intent by the landowners to develop the area for light industrial uses.

WHITSTRAN — In Whitstran the light industrial designation encompasses lands located at the northwest corner of the intersection of Rothrock Road and Old Inland Empire Highway. This area is currently characterized by industrial activity. The Burlington Northern Railroad tracks traverse the area.

Heavy Industrial (HI)

Definition and Purpose:

Areas used to provide land suitable and desirable for those industrial activities which help maintain or improve the County's economy and employment which may create objectionable or adverse conditions (noise, smoke, odor, etc.) to urban activities. The primary purpose of this classification is to encourage new industrial development or expansion to locate away from the urban areas so that conflicts between urban and industrial activities will be minimized while maintaining proximity to the labor, existing industry, utilities, and transportation facilities. Development within such areas should be concentrated where practical in order to optimize use of land, utilities, transportation facilities, linkages between industries, etc.

The primary objective of industrial land use planning is to provide suitable space and facilities for industrial activities and to integrate such activities into the overall county land use pattern in such a manner that the activities add to the economic well-being and stability of the county with a minimum of adverse effects. The plan recognizes the importance of industrial activities for employing county residents as well as for strengthening the county's economic base. A strong economic base is generally associated with a large diversity of industrial activities. Currently, Benton County's economic base is not characterized by such a diversity, but is rather heavily based on agriculture and nuclear-oriented industries.

Although a diversity of industry is encouraged, the Plan recognizes that some industries have the potential of adversely affecting air, water and land quality to such an extent that the livability of an area may be reduced to that which is undesirable for urban residential use. The heavy industrial classification provides for the location of such industries in areas which will have little adverse impact upon urban living. Such areas are designated east of Kennewick and Prosser and north of the residential development in Richland and are displayed on the Kennewick/Finley, Prosser/Roza and Richland/West Richland land use plan maps.

Location:

EAST FINLEY — East of Kennewick and Finley the designation encompasses lands currently used for heavy industrial activities adjacent to or near the Columbia River. Much of this land is owned by the Port of Kennewick, although a substantial amount of the area is under private ownership. In addition to the industrial activities, sparsely scattered residences characteristic of a rural, agricultural area are found. The principal existing land use is irrigated agriculture. Adjacent land use is irrigated agriculture and rural residential, providing a buffer between the industrial activities and the urbanized Kennewick area. This area has the largest diversity of transportation modes of all of the industrial areas designated. Barge transport is available with the Columbia and Snake Rivers lock and dam system. Rail access is established with both the Burlington Northern and Union Pacific Railroads. Road access is established with a network of county arterial and access routes. Topographically, the area is ideally suited for industrial activities requiring large acreages of flat lands. The prevailing southwesterly winds make the area one of the most desirable for the location of those activities which may create objectionable smoke and/or odor as the designation is located downwind from the metropolitan area.

HOVER — The area along Ayers Road down to the government taking line along the Columbia River is identified as heavy industrial.

Port of Kennewick, although a substantial amount of the area is under private

ownership. In addition to the industrial activities, sparsely scattered residences characteristic of a rural, agricultural area are found. The principal existing land use is irrigated agriculture. Adjacent land use is irrigated agriculture and rural residential, providing a buffer between the industrial activities and the urbanized Kennewick area. This area has the largest diversity of transportation modes of all of the industrial areas designated. Barge transport is available with the Columbia and Snake Rivers lock and dam system. Rail access is established with both the Burlington Northern and Union Pacific Railroads. Road access is established with a network of county arterial and access routes. Topographically, the area is ideally suited for industrial activities requiring large acreages of flat lands. The prevailing southwesterly winds make the area one of the most desirable for the location of those activities which may create objectionable smoke and/or odor as the designation is located downwind from the metropolitan area.

PROSSER — In the Prosser vicinity the heavy industrial designation is located east of town between the south bank of the Yakima River and the Burlington Northern Railroad tracks. The site of the Port of Benton industrial park is located in the western portion of the area and contains two food processing industries. Lands to the east are privately owned large acreage parcels.

PLYMOUTH — Heavy industrial areas are designated at Plymouth west of the community. Much of this area is located south of Christy Road encompassing lands owned by the Corps of Engineers adjacent to the Columbia River. The only industrial activity located in the vicinity, the Northwest Pipeline natural gas compressor station, is included within this designation and extends north of Christy Road..

The area designated heavy industrial includes about 140 acres of land owned by the Port of Kennewick and proposed for an industrial park with barge docking and loading facilities. Approximately 500 acres of land have been designated heavy industrial south of State Highway 14 and north of the Burlington Northern Railroad right-of-way to the immediate west of the medium density residential designation. Most of this area is owned by the U. and I. Corporation which has existing and proposed industrial uses for the site.

RICHLAND — In the Richland vicinity, the heavy industrial designation is located in an "island" of unincorporated government land bordering the Hanford Reservation at the north and the city at the east, south and west. The northernmost portion (approximately three-fourths) of the area is designated heavy industrial. The remaining area is included within the light industrial classification. Although the area designated is currently undeveloped, industrial activities are located within the city to the east.

PUBLIC (P)

Definition and Purpose:

Areas under public ownership desired to be used for existing or anticipated public uses such as schools, parks, playgrounds, and other local, state or federal activities or facilities. The primary purpose of this classification is to identify areas of significant present and/or potential public use and investment to prevent incompatible uses from encroaching upon such areas.

Designating various types of residential, commercial and industrial land use classifications on the plan maps makes provision for the location of those activities. As these areas develop, stresses will be placed on existing public facilities and services. Since one of the primary objectives of the Benton County Comprehensive Plan is to encourage urban growth within designated urban growth boundaries, stresses will be primarily felt by the respective municipalities.

Urban development is strongly encouraged to locate adjacent to existing urban development and municipal utilities and services. The plan does not specifically address the future municipal utility and service needs which will be generated by the development within urban growth boundaries. However, the plan does recognize the importance of coordinating planning activities within urban growth boundaries and encourages the formulation of joint city-county urban growth management agreements for coordinating closely with the County when planning for the location of municipal facilities in the unincorporated areas. When such lands are identified and/or acquired for future use, the Benton County Comprehensive Plan should be amended to identify and protect such areas to assure that the cities will not be caught short in providing adequate services.

County services, special districts and school systems will be impacted in addition to stresses placed on municipalities. Since the County has a parks and recreation department with planning functions separate from the County planning department, coordination should be maintained between the two departments to assure adequate parks and recreation services are provided in conjunction with county land development. Special districts and the County Planning Department need to work together to assure adequate capital improvements are planned to maintain effective service capabilities. School district and the County Planning Department also need to work together in identifying lands which may be needed in undeveloped unincorporated areas planned for residential use. The plan maps should be amended to designate such lands as they are identified and/or acquired.

Location:

PARK SITES — Parklands designated include the following: Columbia, Horn Rapids, Hover, and Two Rivers Benton County Parks; Crow Butte State Park; and Plymouth Park operated by the Corps of Engineers. In addition, an area of some 360 acres of land owned by the Army Corps of Engineers on the Columbia River approximately one and one-half miles southeast of Finley has been included within the public land use classification. This area is not intended to be developed parkland. Rather, it is anticipated that the area will remain in a natural state and will be preserved by the Corps of Engineers for its wildlife habitat characteristics.

Two sites of undeveloped land planned for park improvements in the Richland and Kennewick comprehensive plans are also designated. One of these sites is located in the Richland vicinity and is designated adjacent to the south bank of the Yakima River south of the Richland Bypass Highway (State Route 240). In Kennewick the site borders the Columbia River immediately east of the city and north of East Third Avenue. Possible future regional park sites are located (1) southeast of Benton City, (2) north of Prosser on the north bank of the Yakima River, and (3) south of Paterson on the north bank of the Columbia River.

In addition, lands under federal ownership and managed for their fish and wildlife habitat, e.g. Umatilla National Wildlife Refuge, are designated as "public" use. Similarly, approximately 4,800 acres of land under the Bureau of Land Management and Washington Game Department ownership south of the Hanford Site and west and adjacent to Horn Rapids Park are given the "public" designation.

SCHOOL SITES — Public school facilities are designated at Finley, Paterson, Plymouth and Whitstran. Possible future sites for public school purposes are identified in the Candy and Badger Mountain vicinities. Land presently owned by the Kennewick School District for future use is designated public and is located at the southwest intersection of South Highland Drive and South Cascade Street in the South Highlands area.

WASTE TREATMENT SITES — The plan designates approximately 90 acres for future municipal use including community waste treatment facilities in the Plymouth vicinity immediately east of the community on lands owned by the Corps of Engineers.

Other publicly owned lands encompassed within this classification include the Washington State game farm east of Finley, Washington State University agricultural experiment station lands north of Prosser and the Benton-Franklin Fairgrounds.

Hanford Reservation

Definition and Purpose:

Land used to provide sites and/or facilities for those activities which are nuclear in nature. Uses which are not approved by the United States Department of Energy (DOE) are prohibited. Activities which are not nuclear in nature may be allowed if and when DOE approval for such activities is obtained. DOE approved non-governmental activities located within this designation shall conform to all Benton County ordinances. The Hanford Reservation is located in the desert area northeast of the Rattlesnake Hills.

Urban Growth Boundaries (UGB)

Definition and Purpose:

The urban growth boundaries identify and delineate the areas which may reasonably be anticipated to become annexed to incorporated cities within the next five to ten years. The primary purposes of this designation are to facilitate the orderly expansion of the incorporated cities and to control urban development from encroaching out into the rural areas of the County before adequate urban services and transportation networks are established to accommodate such development. Urbanization of land within the urban growth boundary should not occur until such services are provided. Annexations of unincorporated lands outside the urban growth boundary should be strongly discouraged as should the extension of city services into such areas. Since the areas within the urban growth boundary will eventually become incorporated, the County should coordinate all planning activities occurring within such ares with respective incorporated cities to assure that the urbanizing process is compatible with both city and county plans and programs. Urban commercial and residential developments (i.e., regional and community commercial and low, medium, and high density residential developments) will not be permitted outside urban growth boundaries exclusive of those areas which may be designated on the plan maps for urban residential and commercial development within and adjacent to the unincorporated communities of Finley, Plymouth, Paterson, Whitstran and Kiona.

Urban growth boundaries are delineated around the cities of Benton City, Kennewick, Prosser, Richland and West Richland. Although the community of Plymouth is not incorporated, a proposed urban growth boundary is delineated encompassing those lands which are suitable and desirable for incorporation.

The following table displays acreage and population data for those plan designations within urban growth boundaries which allow residential development (exclusive agriculture, general agriculture, rural residential- five acre, rural residential-one acre, hillside residential, low density residential, medium density residential, and high density residential). As shown, 36,528 acres of unincorporated lands are planned for various densities of residential development within the urban growth boundaries alone. The population of these areas (based upon 1978 housing distribution data) is approximately 16,000 persons. If the areas fully develop at the maximum allowed densities as defined by the various land use plan classifications designated, an estimated population of 315,512 persons would occupy the areas. This is nearly three times the current population of the County and nearly double the state's population forecast for Benton County for the year 2000. It should be noted that this does not even include city areas.

It would appear that more land is planned for urban expansion than may realistically be needed. Even if the County experiences great economic growth within the next twenty years, the additional population growth could be accommodated by the land use plans, and within the unincorporated areas of the urban growth boundaries alone.

TABLE 57: URBAN GROWTH BOUNDARY STATISTICS
(Unincorporated Area)

URBAN GROWTH BOUNDARY	LAND AREA[a] (Acres)	1978 POPULATION[b] (Persons)	POPULATION CAPACITY[c] (Persons)
Benton City	1,149	318	8,502
Kennewick	15,774	13,261	129,510
Prosser	1,824	529	12,244
Richland	8,638	941	80,863
West Richland	8,450	514	71,689
Plymouth	693	173	12,704
TOTAL	36,528	15,736	315,512

a. Unincorporated areas as of July, 1982 encompassed within the various residential, rural residential and agricultural land use plan designations within urban growth boundaries.

b. Estimated from Benton County Planning Department 1978 housing distribution maps and related field notes assuming (1) a vacancy rate of 0.0% and (2) persons per dwelling unit for dwelling unit types are as follows: conventional house and duplex = 2.88; manufactured (mobile) home = 2.27; and multi-family units of 3 units and greater = 1.95.

c. Estimated assuming (1) development occurs at the maximum allowed land use plan density, (2) necessary supporting services are established, (3) mitigating measures are taken in environmentally sensitive areas to accommodate maximum density development, (4) a vacancy rate of 0.0% and (5) persons per dwelling unit for the respective plan designations are as follows:

high density residential = 1.9 persons/dwelling unit
medium density residential = 2.7 persons/dwelling unit
low density residential = 2.8 persons/dwelling unit
rural residential (1) = 3.0 persons/dwelling unit
rural residential (5) = 3.0 persons/dwelling unit
general agriculture = 3.0 persons/dwelling unit
exclusive agriculture = 3.0 persons/dwelling unit

Location:

BENTON CITY — At Benton City, the urban growth boundary extends to Whan Road to the west and Corral Creek Road to the north. The Yakima River forms the boundary to the east and south.

KENNEWICK — At Kennewick, the urban growth boundary is formed by the City's municipal utility service boundary to the west and east. The western boundary generally corresponds to the western extension of the city limits, and the eastern boundary corresponds to the north-south line associated with Havana and Dague Roads. The Columbia River forms the northern boundary. To the south, the boundary is generally formed by the Game Farm Road alignment extended to State Route 14, then south to the section line located one mile south of Locust Grove Road, extending westward along that section line for approximately four miles.

PROSSER — The Prosser urban growth boundary is formed at the south by the Prosser corporate limits and the base of the steep lands (greater than 15% average slope) of the north slope of the Horse Heaven Hills. The north and east boundaries are principally formed by Interstate 82. South of the Yakima River, the western boundary is Ward Cap Road extended. North of the River, the western boundary is formed by Webb and Albro Roads extended.

PLYMOUTH — The Plymouth urban growth boundary is formed to the north by State Route 14 and its proposed extension to the proposed route of Interstate 82. The proposed route of I-82 forms the eastern boundary. To the south, the Washington State line in the Columbia River is the boundary. The western boundary is located approximately one-eighth of a mile west of the natural gas compresser station along the section line dividing Sections 10 and 11 of Township 5 North, Range 27 East; and in the northern part of the area is formed by the section line dividing Sections 1 and 2 of Township 5 North, Range 27 East.

RICHLAND — At Richland, the northern, eastern, and western boundaries are formed principally by the present city limits line. South of West Richland the boundary is formed by the proposed route of Interstate 82. The separation between the Richland and West Richland urban growth areas is the line associated with the separation of the respective cities' municipal utility service areas. This roughly corresponds to an east-west line in the vicinity of State Route 12 from the proposed route of I-82 in the west, to the Richland city limits in the east.

WEST RICHLAND — The West Richland urban growth boundary to the south is that east-west line as described above. To the east the line principally formed by the Yakima River. To the west and north the urban growth boundary has been extended to include the annexation which took place in 1981 and that incorporated some 10,000 acres - almost all of the "Horn" area.

Mineral and Aggregate Resources

This designation identifies areas of sand, gravel, stone and other mineral deposits which have been, are now or may be excavated and processed for road and building construction activities. The full development of the County as anticipated in the Land Use Element of the Comprehensive Plan will necessitate consumption of vast amounts of aggregate resources. Since aggregate is limited in its location and quantity, it is important that sources be identified and protected from the encroachment of incompatible uses.

Additional research is needed to determine quantities, qualities and locations of existing and potential sources, particularly within the developing areas of the County. The sites identified on the plan maps are not necessarily inclusive of all mineral and aggregate resources within the planning regions. All identifiable sources should be afforded the same recognition and protection as those mapped.

Semi-Public Facilities

The semi-public facilities symbols on the Countywide map identify existing and future semi-public facilities including but not limited to electrical power substations, telephone switching centers, and natural gas regulating stations. These facilities need to be located in the vicinity of the area served and usually do not require large acreages for their placement. Since electrical power, telephone communication, and natural gas are among the requirements for urban development, it is important that future facility sites be identified and available so that the necessary facilities can be established in a timely manner

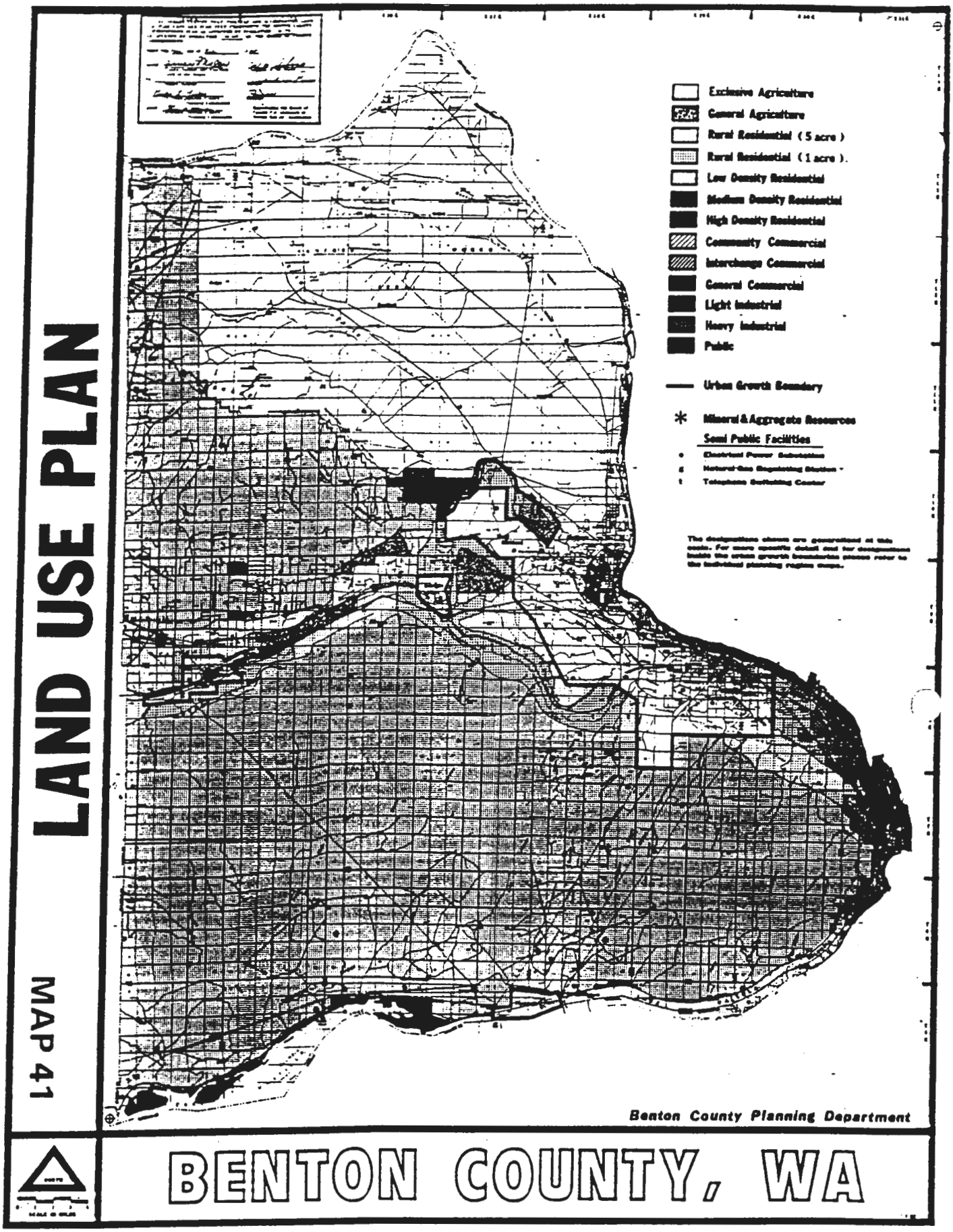
Semi-public agencies should be encouraged to coordinate their planning activities with the Benton County Planning Department to assure adequate provisions are made for the location of such facilities in conjunction with the residential, commercial, and industrial development of the County. In those instances where the facilities are located in residential areas, or areas planned for residential use, efforts should be made to make their appearance aesthetically pleasing.

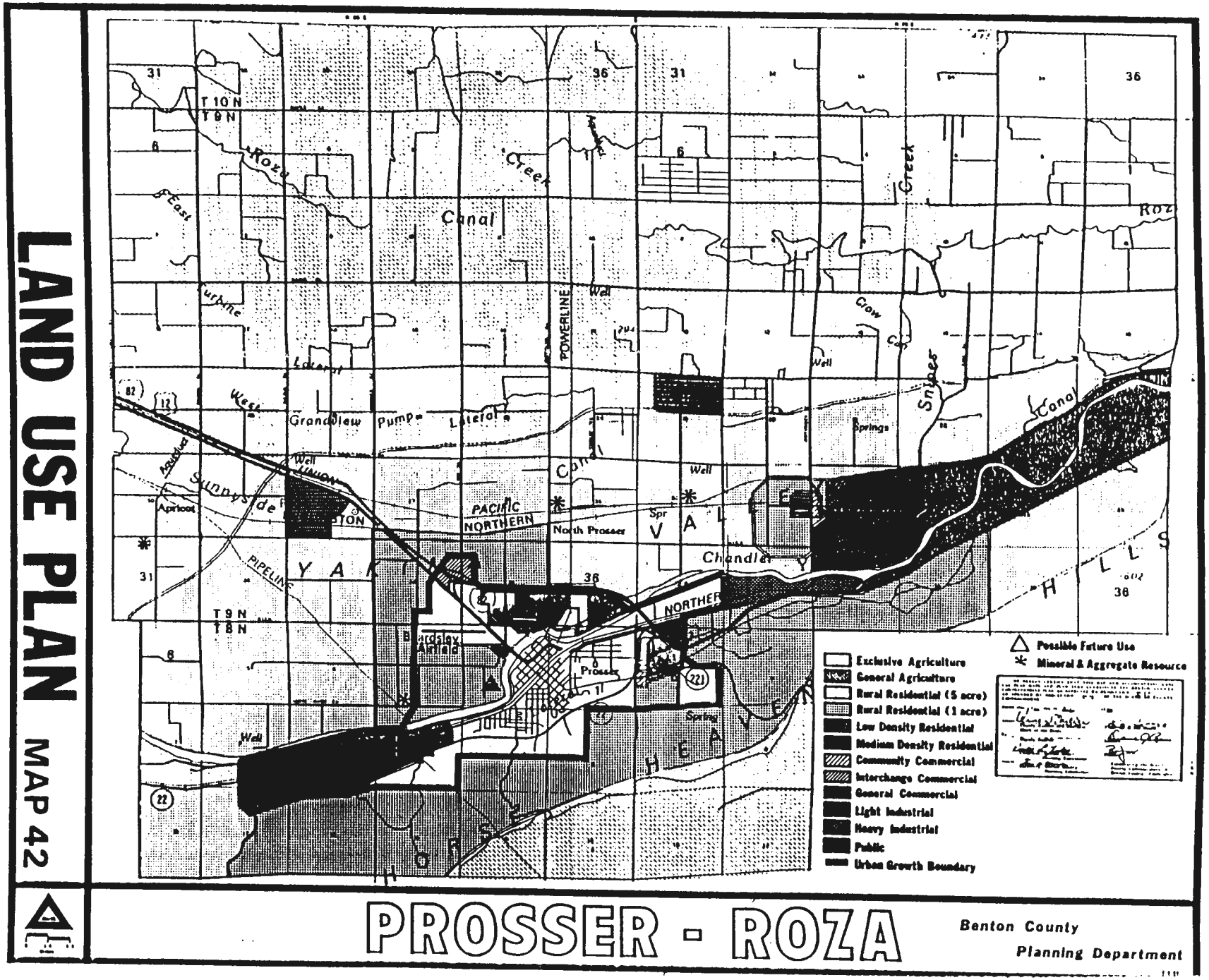
Map Amendments

It is recognized that over time amendments to the Land Use Plan Maps will be necessary in order to maintain their viability and effectiveness. Typical grounds for map amendments include:

1. Updated data manifesting significantly different trends than previous data.
2. New data reflecting new or previously undisclosed public needs.
3. Objective evidence of a new community attitude.
4. Statutory changes significantly affecting the applicability or appropriateness of existing plan map designations.
5. A demonstrable error or major inconsistency in the existing map designations.

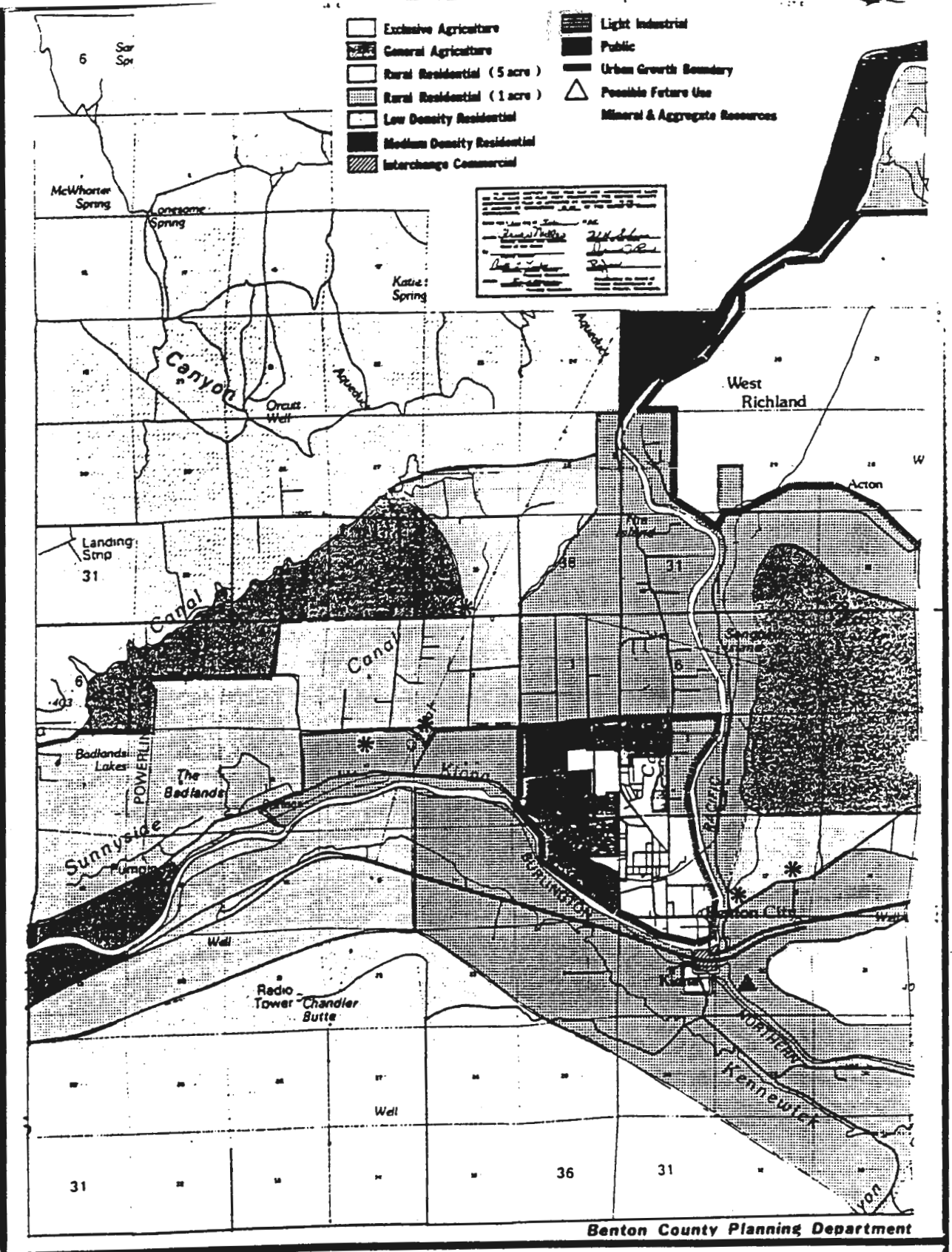
Map Amendments will follow the procedure described in Chapter V "Review and Amendment Procedures."


LAND USE PLAN
MAP 41
Exclusive Agriculture
General Agriculture
Rural Residential (5 acre)
Rural Residential (1 acre).
Low Density Residential
Medium Density Residential
High Density Residential
Community Commercial
Interchange Commercial
General Commercial
Light Industrial
Heavy Industrial
Public
Urban Growth Boundary
Mineral & Aggregate Resources
Semi Public Facilities
Benton County Planning Department
BENTON COUNTY, WA



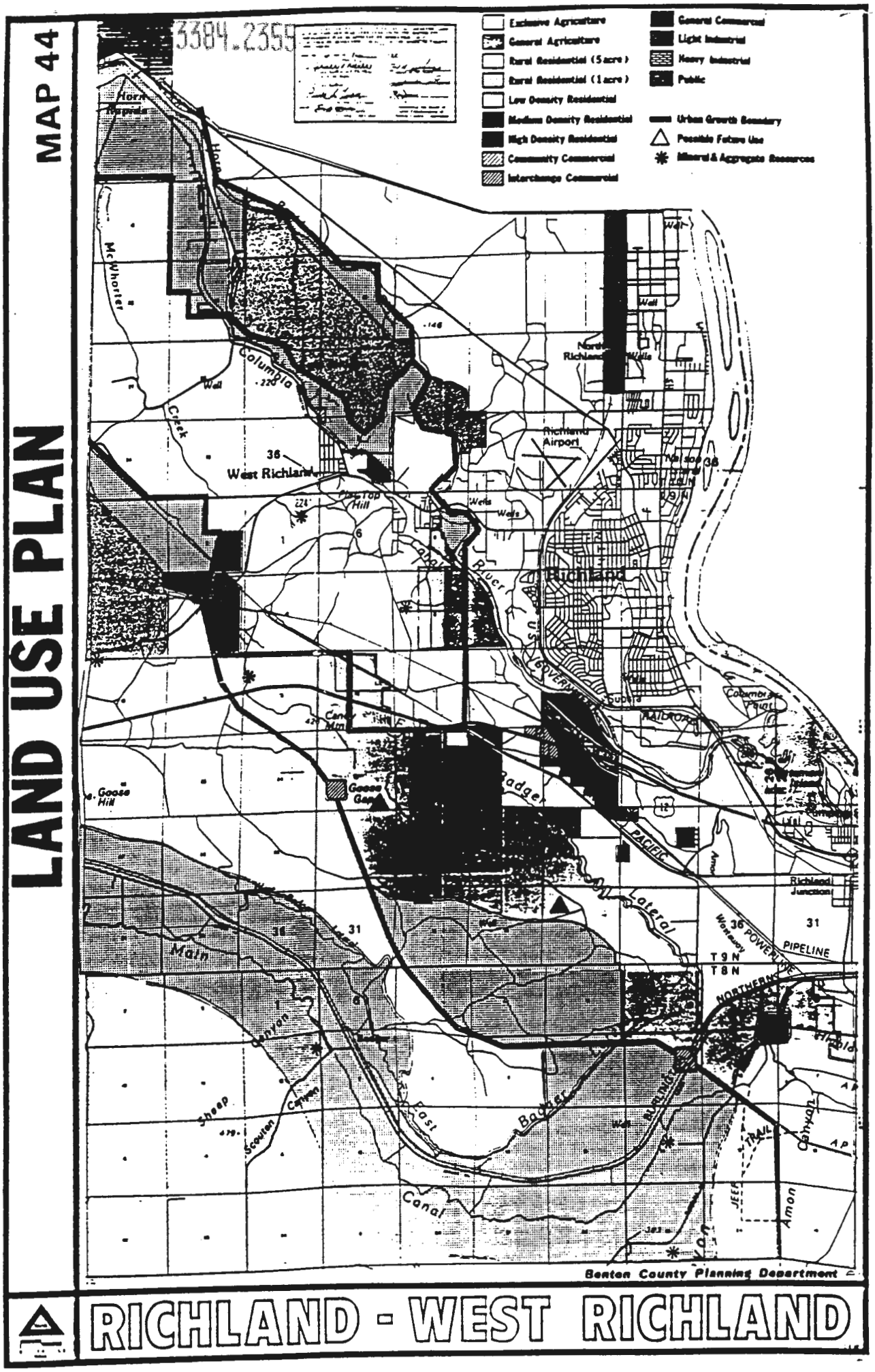
LAND USE PLAN

MAP 43

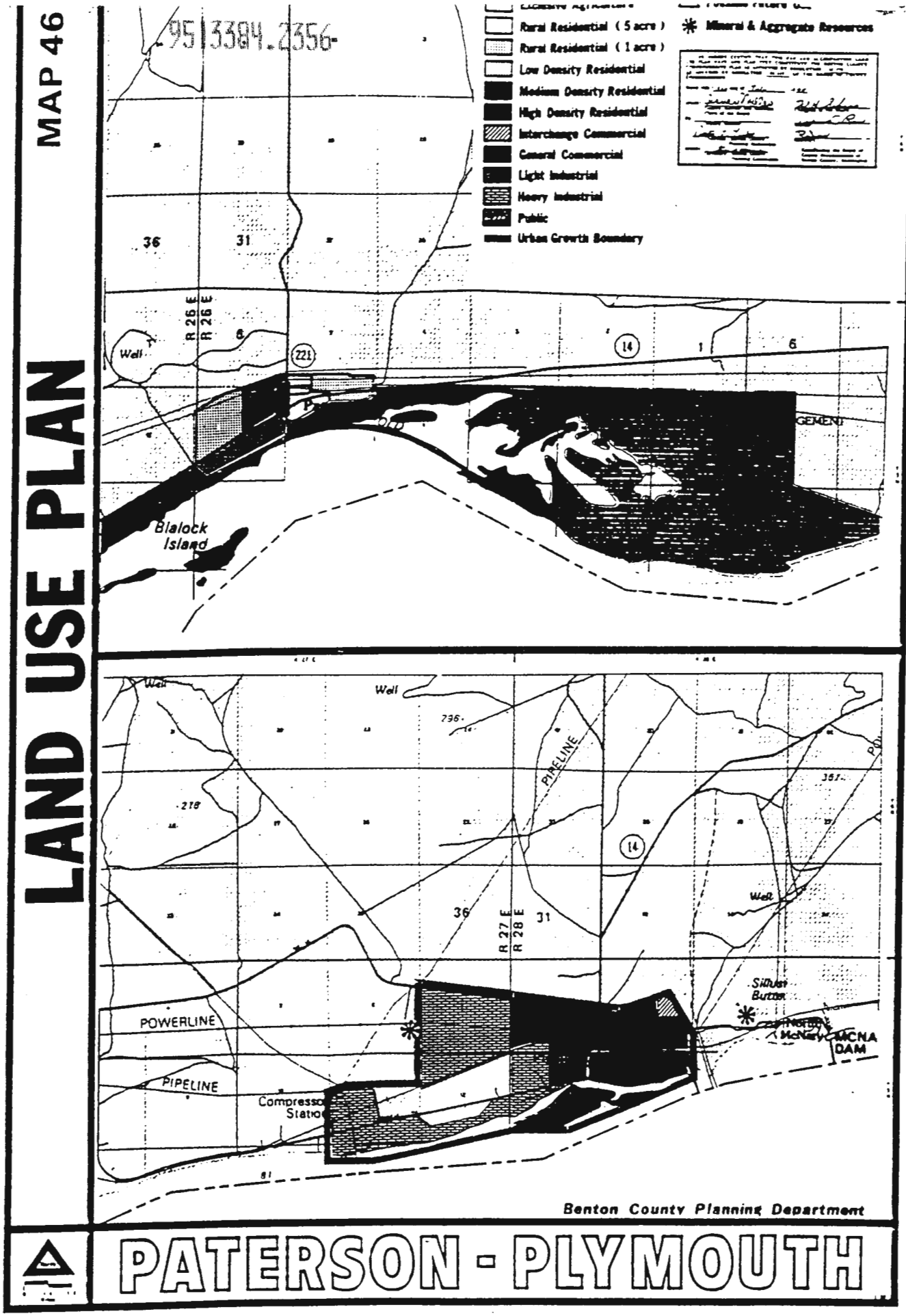


Benton County Planning Department

BENTON CITY - KIONA


MAP 44
LAND USE PLAN
3384.2355
Exclusive Agriculture
General Agriculture
Rural Residential (5 acre)
Rural Residential (1 acre)
Low Density Residential
Medium Density Residential
High Density Residential
Community Commercial
Interchange Commercial
General Commercial
Light Industrial
Heavy Industrial
Public
Urban Growth Boundary
Possible Future Use
Mineral & Aggregate Resources
Horn Rapids
McWhorter
Columbia
Creek
West Richland
Richland Airport
Richland
Goose Hill
Badger
Canyon
Main
Lateral
PACIFIC
POWERLINE
PIPELINE
NORTHERN
Sheep
Canal
Benton County Planning Department
RICHLAND - WEST RICHLAND

LAND USE PLAN
MAP 45
KENNEWICK - FINLEY
Benton County Planning Department
Exclusive Agriculture
General Agriculture
Rural Residential (5 acre)
Rural Residential (1 acre)
Low Density Residential
Medium Density Residential
High Density Residential
Community Commercial
Interchange Commercial
General Commercial
Light Industrial
Heavy Industrial
Public
Urban Growth Boundary
Possible Future Use
Mineral & Aggregate Resources
Kennewick
VISTA FIELD
Columbia River
Division Canal
POWERLINE
Zintel Canyon
Canal
Jump Off Joe
Radio Facility
Johnson
The Butte
T8N
T7N


MAP 46
LAND USE PLAN
95 3384-2356
Rural Residential (5 acre)
Rural Residential (1 acre)
Low Density Residential
Medium Density Residential
High Density Residential
Interchange Commercial
General Commercial
Light Industrial
Heavy Industrial
Public
Urban Growth Boundary
Mineral & Aggregate Resources
36
31
R 26 E
R 26 E
6
Well
221
14
1
6
Blalock Island
Well
796
PIPELINE
218
351
14
36
31
R 27 E
R 28 E
Well
POWERLINE
PIPELINE
Compressor Station
Siltum Butte
McNary
MCNA DAM
81
Benton County Planning Department
PATERSON - PLYMOUTH

Plan Map Designation Totals

The following tables present the total acreages planned for the different land uses in the County, a comparison with the long-range land use needs estimates presented earlier, and an analysis of the population capacity increase provided by the Plan.

Tables 58 through 63 present a statistical summary of total land uses designated on the Land Use Plan Maps.

TABLE 58: BENTON COUNTY - TOTAL UNINCORPORATED AREA PLAN MAP DESIGNATIONS
(Exclusive of the Hanford Site)

CLASSIFICATION	ACREAGE	PERCENT
Agricultural[1]	629,946	81
Residential[2]	128,804	17
Commercial[3]	815	0
Industrial[4]	3,580	1
Public	15,067	2
TOTAL	778,212	101*

*Does not add up to 100% due to rounding

1. E.A.
2. RR-5, RR-1, LDR, MDR, HDR
3. CC, IC, GC,.
4. LI, HI

TABLE 59: PLAN MAP DESIGNATION TOTALS PROSSER/ROZA PLANNING REGION
(Unincorporated Area)

CLASSIFICATION	ACREAGE	PERCENT
Agricultural	40,713	61
Residential	24,972	37
Commercial	124	0
Industrial	455	1
Public	449	1
TOTAL	66,713	100

TABLE 60: PLAN MAP DESIGNATION TOTALS BENTON CITY/KIONA PLANNING REGION
(Unincorporated Area)

CLASSIFICATION	ACREAGE	PERCENT
Agricultural	23,700	44
Residential	28,273	52
Commercial	40	0
Industrial	100	0
Public	2,293	4
TOTAL	54,406	100

TABLE 61: PLAN MAP DESIGNATION TOTALS RICHLAND/WEST RICHLAND PLANNING REGION
(Unincorporated Area)

CLASSIFICATION	ACREAGE	PERCENT
Agricultural	8,295	15
Residential	46,633	83
Commercial	230	0
Industrial	583	1
Public	543	1
TOTAL	56,284	100

TABLE 62: PLAN MAP DESIGNATION TOTALS KENNEWICK/FINLEY PLANNING REGION
(Unincorporated Area)

CLASSIFICATION	ACREAGE	PERCENT
Agricultural	13,936	31
Residential	27,745	62
Commercial	245	1
Industrial	1,208	3
Public	1,368	3
TOTAL	44,502	100

TABLE 63: PLAN MAP DESIGNATION TOTALS PATERSON/PLYMOUTH PLANNING REGION
(Unincorporated Area)

CLASSIFICATION	ACREAGE	PERCENT
Agricultural	38,581	85
Residential	1,111	2
Commercial	176	0
Industrial	1,234	3
Public	4,570	10
TOTAL	45,672	100

Tables 64 and 65, along with table 57 which presented estimated population capacities of the unincorporated urban growth boundary areas, present a statistical summary of the degree of long-range growth that could be accommodated by the Comprehensive Plan. All the analyses of projected growth and Plan capacities for residential development indicate that Plan provisions for residential development far exceed even the highest long-range growth projections.

The State's official population projection for Benton County is for 162,245 people by the year 2000. The population capacity of the unincorporated lands designated for residential use within the urban growth boundaries alone has been calculated to be for 315,512 people - nearly double the projected need for the total County. The population capacity of the unincorporated residential designations within the planning regions is estimated to be for 439,199 people - over two and one-half times the projected population for the entire County by the year 2000. It is recognized that not all of the land designated for residential use is buildable. However, even with unbuildable lands subtracted from the figures, substantial excess capacity remains. It should be noted that none of these calculations take into account the capacities of the land within cities. Clearly, the Comprehensive Plan provides for growth and expansion significantly in excess of the need indicated by available growth estimates.

TABLE 64: COMPARISON OF NON-AGRICULTURAL LAND USE NEEDS AND PLAN PROVISIONS
(Total Unincorporated Area, Exclusive of the Hanford Site)

USE TYPE	ESTIMATED YEAR 2000 LAND NEEDS* (Acres)	AMOUNT PROVIDED IN PLAN MAPS (Acres)
Residential	54,348	128,804
Commercial	419	815
Industrial	716	3,580
Public	2,694	15,067
TOTAL	58,177	148,266

*From Table 56

TABLE 65: ESTIMATED POPULATION CAPACITIES OF PLANNING REGIONS
(Unincorporated Area) BASED UPON RESIDENTIAL PLAN MAP DESIGNATIONS

PLANNING REGION	1978 EST. POPULATION[1]	ESTIMATED POP. CAPACITY[2]	% INCREASE IN CAPACITY[3]
Prosser-Roza	3,930	29,897	661
Benton City-Kiona	1,714	50,263	2,833
Richland-West Richland	2,689	196,720	7,216
Kennewick-Finley	18,062	146,223	710
Paterson-Plymouth	302	16,096	5,230
TOTALS-All Regions	26,697	439,199	1,545

1. From the 1978 housing survey.

2. Based upon the following:

   a. Development at maximum allowed Plan density except for Hillside Residential which due to physical constraints has been calculated at one dwelling unit per two acres inside UGB's, and one dwelling unit per 10 acres outside UGB's.

   b. Household sizes are as follows: GA = 3, RR-5 = 3, RR-1 = 3, LDR = 2.8, MDR = 2.7, and HDR = 1.9.

3. Represents percentage increase of potential capacity over current estimated population.

CONCLUSION

As was mentioned, the Land Use Element is to a large extent a synthesis and culmination of all the factors that went into the Plan development process. The Land Use Plan Maps can be considered to be the major policy statements of the Comprehensive Plan. The Plan Maps provide for the growth and development of the County while maximizing the County's livability and protecting its economic base.

The goals, policies, recommendations, and Plan Maps are the major components of the Comprehensive Plan. When viewed in this manner, the Comprehensive Plan can provide a framework that will enable the citizens and decision makers of Benton County to deal with the long-range growth and development of the County so as to optimize the County's quality of life for both present and future generations.

CHAPTER XII

IMPLEMENTATION

INTRODUCTION

The Comprehensive Plan provides a policy framework for guiding the growth and development of the County. Implementation of the Plan is achieved primarily through the means of regulatory controls and public improvements programs. The Planning Enabling Act (RCW 36.70) contains provisions that provide for this implementation in a straightforward manner.

Simply put the Comprehensive Plan is to be the overall guiding document for land use decisions. The extent to which the Plan is to provide a framework for these kinds of decisions is indicated by RCW 36.70.450:

> "After a board has approved a motion and certified all or parts of a comprehensive plan for a county or for any part of a county, the planning agency shall use such plan as the basic source of reference and as a guide in reporting upon or recommending any proposed project, public or private, as to its purpose, location, form, alignment and timing. The report of the planning agency on any project shall indicate wherein the proposed project does or does not conform to the purpose of the comprehensive plan and may include proposals which, if effected, would make the project conform. If the planning agency finds that a proposed project reveals the justification or necessity for amending the comprehensive plan or any part of it, it may institute proceedings to accomplish such amendment, and in its report to the board on the project shall note that appropriate amendments to the comprehensive plan, or part thereof, are being initiated."

REGULATORY CONTROLS

Regulatory controls (referred to as "official controls" in the Planning Enabling Act) include such programs as zoning and subdivision control and provide a direct means for Plan implementation. Their relationship to the Plan is made clear in their definition according to RCW 36.70.020 (11):

> "Official controls" means legislatively defined and enacted policies, standards, precise detailed maps and other criteria, all of which control the physical development of a county or any part thereof or any detail thereof, and are the means of translating into regulations and ordinances all or any part of the general objectives of the comprehensive plan. such official controls may include, but are not limited to, ordinances establishing zoning, subdivision control, platting, and adoption of detailed maps."

The provisions for enactment of these regulatory controls further clarifies their importance to the plan implementation:

> "From time to time, the planning agency may, or if requested by the board shall, cause to be prepared official controls which when adopted by ordinance by the board, will further the objectives and goals of the comprenensive plan. The planning agency may also draft such regulations, programs and legislation as may, in its judgment, be required to preserve the integrity of the comprehensive plan and assure it systematic execution, and the planning agency may recommend such plans, regulations, programs and legislation to the board for adoption." (RCW 36.70.550)

Zoning Administration

The Zoning Ordinance is the major tool available to counties to implement the goals and policies of their comprehensive plans. The zoning ordinance regulations and restricts the location and use of land within mapped zoning districts. Where the land use plan is a general, long-range guideline, zoning is a specific, short-range regulatory tool used in the day-to-day operations of the planning program. In short, the zoning ordinance is a specific, detailed piece of legislation which carries out the more general goals and policies of the comprehensive plan.

Before a building permit is issued or a subdivision approved, compliance with the zoning ordinance must be established. Re-zones, or changes in a particular parcel's zoning district classification, may be approved by the planning commission and subsequently approved and certified by the Board of County Commissioners if the need for the change can be demonstrated to be in the public interest and if the proposed change is in conformance with the comprehensive plan. A change in zone which allows less restrictive use of land than that designated for the same land on the comprehensive plan land use map will not be approved without first amending the plan map to a less or equally restrictive land use plan designation as that of the proposed zone change. After adoption of a comprehensive plan update or amendment which would make the current zoning less restrictive than the amended plan, the zoning will be brought into compliance with the updated or amended plan.

Subdivision Administration

Subdivision Ordinance

The Subdivision Ordinance provides rules and regulations for the approval of divisions of land into five or more lots (long plat), any one of which is less than 20 acres in size. Standards are prescribed for the design, layout and subsequent development of the proposal. Subject to a planning commission conducted public hearing, and a recommendation of approval or denial, the Board of County Commissioners may either approve or deny preliminary subdivision proposals. Once preliminary approval is granted, developers are given a prescribed length of time to fully develop the plat in accordance with the ordinance and any special conditions which might have been attached to the approval of the preliminary plat. Developers have the opportunity to request preliminary plat time extensions of the planning commission if additional time is necessary. Denial of a time extension requires the developer to either finalize the plat in the prescribed time or submit a new preliminary plat proposal. The character of an area is set for years to come by the initial quality of the subdivision.

As in the case with zoning, the subdivision ordinance will be amended to conform to the Comprehensive Plan as updates or amendments to the plan necessitate. Where preliminary plat approval is given prior to such updates or amendments, final plat review and approval will be made in accordance with the regulations in effect at the time preliminary approval was granted. However, updates or amendments of the Plan and/or ordinances may be considered when reviewing preliminary plat applications when such updates or amendments are adopted prior to preliminary plat approval by the Board of County Commissioners.

Short Plat Ordinance

Short plats or short subdivisions are divisions of land into four or fewer lots, any one of which is less than twenty acres in size. The short plat ordinance provides rules and regulations for approval of these divisions and prescribes standards for their design and development. Standards for short plats are generally less stringent than those imposed for long plats. The Benton County Planning Director reviews the plat for compliance with the comprehensive plan, zoning ordinance, short plat subdivision ordinance, and county policy and approves or disapproves it. The short plat ordinance will be revised whenever updates or amendments to the Comprehensive Plan necessitate.

Manufactured (mobile) Home Park Administration

The manufactured (mobile) home park ordinance establishes minimum standards and criteria for manufactured (mobile) home park location, development, and use and provides for the approval and issuance of permits and licenses for manufactured (mobile) home parks (five or more mobile homes on a single lot). After a public hearing the Benton County Board of Adjustment may approve a manufactured (mobile) home park permit application with or without conditions. Once the requirements of the ordinance and conditions have been met, the planning director will issue the permit. Once the permit has been issued, manufactured (mobile) home park licenses must be renewed annually with the Benton County Building and Fire Prevention Department.

Building Code

The building code is designed to protect the health and safety of people using property and structures. It provides a variety of standards relating to such concerns as structural strength, fire safety, sanitation facilities, light, ventilation, and room sizes. In addition to protecting the public health and safety, building codes contribute to the long-term value and viability of a development by minimizing the impairment of use of that development by reasons of dangerous or unhealthy conditions. Benton County utilizes the Uniform Building Code. Enforcement is carries out by the County building inspector.

Shoreline Management Master Plan

The State of Washington's Shorelines Management Act of 1971 requires that counties and cities prepare and administer shoreline management plans and related implementation programs for shorelines located within their jurisdictions. The rivers and streams and associated wetlands designated by the Department of Ecology as shorelines of statewide significance in Benton County which fall under the jurisdiction of the Act include the Columbia and Yakima Rivers and Glade Creek.

The Benton County Shoreline Management Master Plan was approved by the Department of Ecology in 1974 as having met the intent of the state law. The overall goals of the shoreline plan are to (1) recognize and protect statewide interest over local interest, (2) preserve natural character, (3) encourage uses which result in long-term benefit, (4) protect resources and ecology, (5) increase public access to publicly owned areas, and (6) increase recreational

opportunities in those areas under the jurisdiction of the plan. Regulations and procedures are included in the plan which establish a permit system for certain developments or activities locating in designated shoreline areas.

The Benton County Planning Director is the administrator of the shorelines program and operates the permit system. A shoreline hearing board, consisting of the members of the Benton County Board of Adjustment exists for the purpose of conducting public hearings and recommending approval of (1) conditional uses within the shorelines areas, and (2) variances from the shorelines regulations.

Since the shorelines regulations are authorized by the Shorelines Management Act rather than the Planning Enabling Act, the shorelines management program is not considered an official control used in implementing the Comprehensive Plan. However, since the shorelines management program is an integral part of Benton County's planning process, and since developments or activities locating or occurring in shoreline areas must comply with the shorelines regulations as well as the Comprehensive Plan and its related official controls, and effort will be made to integrate the shorelines program with the comprehensive planning program to assure that the goals, policies and designations of the shoreline plan are in conformance with the provisions of the Comprehensive Plan.

PUBLIC IMPROVEMENT PROGRAMS

Public improvements are investments made by the community in the development of facilities which will benefit all citizens. Examples are schools, libraries, parks, fire and police stations, sewer and water facilities, and streets. The timing, location, and prioritization of such public improvements have a substantial impact upon the growth and development of the County. One of functions of the Comprehensive Plan is to provide a general guideline so that the impact is a positive one.

CHAPTER XIII

REVIEW AND AMENDMENT PROCEDURES

INTRODUCTION

The long-range usefulness and credibility of the Comprehensive Plan are dependent upon its ability to adapt to and deal with major changes as they occur in the County. The Plan is the result of the best information, knowledge, and insight that was available at the time that the Plan was formulated and adopted. As new factors evolve and conditions unfold, the Plan will have to be reviewed and updated if it is to continue to effectively serve the County's needs. The review and amendment procedures outlined below are designed to accomplish that objective.

FIVE YEAR REVIEW

In order to ensure its continued effectiveness and relevance to the long-range needs of the County, the Comprehensive Plan shall undergo a major review and update process every five years, commencing the fifth year after adaption. This five year review will be a major evaluation of the continued effectiveness of the Plan and will include a thorough review of the data, conditions, needs, and assumptions upon which the Plan was based. The five year review will also include a citizen involvement program that will provide opportunities for citizen involvement in the review and amendment process. Specifically, citizen advisory committees should be established in each of the planning areas to serve as the mechanism for providing this citizen involvement.

It is anticipated that this five year major review process will result in a major revision of the Comprehensive Plan every five years, including amendments to Plan goals, policies, and maps where time has made such changes necessary if the Plan is to remain an effective guide for the County.

MAJOR REVISIONS

A major revision shall include any change to a Plan goal or policy, any change to a procedure or process established by the Plan (such as the amendment procedures established by this chapter), any substantive change to the text of the "Land Use Element Plan Maps" chapter, or any major land use plan map change. A major land use plan map change is one that would have widespread and significant impact beyond the immediate area of the proposed change, such as a quantitative change allowing for substantial changes in population or significant increases in resource impacts; qualitative changes in the land use itself, such as conversion of residential to industrial use; or spatial changes that affect large areas or many different ownerships.

MINOR REVISIONS

A minor revision shall include changes other than those described above under "Major Revisions" as well as minor land use plan map changes. A minor land use plan map change is one that focuses on a specific individual property and which will not have a significant impact beyond the immediate area of change.

FREQUENCY OF AMENDMENT

Major Revisions:

If the Comprehensive Plan is to maintain its integrity and reliability as a long-range guide for the growth and development of the County, its amendment should not be lightly made. Whenever possible, proposed changes to the Plan should be held in abeyance until the five year review process described earlier. This is especially true for major changes as described under "Major Revisions", above.

During the five year major review process described earlier, any proposed major revisions that have been received during the interim will be considered by the Planning Commission for recommendation to the Board of County Commissioners. If compelling reasons for major Plan revisions arise between the five year intervals, the Planning Commission or Board of County Commissioners can initiate consideration of the proposed amendment.

Minor Revisions:

The following procedure shall be followed for all Plan amendments:

1. The Planning Department will prepare a staff report (including recommendations) regarding proposed Plan amendments.

2. The Planning Commission will hold at least one public hearing on any proposed Plan amendment and will forward its recommendations regarding the proposed amendment to the

GLOSSARY

Board of County Commissioners. The Planning Commission's recommendation will include any recommended changes, additions, or deletions to the proposed amendment that it deems necessary or appropriate, and will also include the Planning Commission's reasons for its decisions.

3. The Board of County Commissioners will have final authority for approval, denial, or modification of all proposed Plan amendments. The Board will hold at least one public hearing prior to making a final determination regarding proposed Plan amendments. If a proposed amendment does not conform to the proposal as initiated by the Board or recommended by the Planning Commission, RCW 36.70.440 requires that the proposed amendment be referred back to the Planning Commission for review before final action by the Board can occur.

INITIATION OF AMENDMENT

The Board of County Commissioners, the Planning Commission, the Planning Department, and Benton County citizens and landowners can initiate the Plan amendment procedure. Other affected individuals, groups, and agencies may petition the Planning Commission for initiation of the amendment procedure. Regardless of who initiates consideration of a proposed Plan amendment, the procedure followed will be that described above in the "Amendment Procedure" section. In all cases, requests for plan amendments shall be expedited and the completion of the "Amendment Procedure" shall occur in a timely manner.

Application upon forms provided by the Planning Department for consideration of a Plan amendment by Benton County citizens or landowners shall be made to the Planning Department and shall describe the reasons for requesting the Plan change, including the physical, social, economic, or environmental changes which have occurred to warrant the change, or, if the reason for the Plan change request is to correct an error in the Plan, a description of the error.

Petition of the Planning Commission for consideration of a Plan amendment by other affected individuals, groups, or agencies shall be made by submitting the petition to the Planning Department to be placed on the Planning Commission's agenda. The petition shall describe the reasons for requesting the Plan change, including the physical, social, economic, or environmental changes which have occurred to warrant the change or, if the reason for the Plan change request is to correct an error in the Plan, a description of the error. The Planning Department shall forward the petition to the Planning Commission together with a staff report for a determination as to whether or not the Plan amendment procedure described under "Amendment Procedure" shall be initiated.

As has been noted in the Land Use Element, changes to the Comprehensive Plan are anticipated over time and are typically based upon the following grounds.

1. Updated data manifesting significantly different trends than previous data.
2. New data reflecting new or previously undisclosed public needs.
3. Objective evidence of a new community attitude.
4. Statutory changes significantly affecting the applicability of appropriateness of the Plan goal, policy, or map.
5. A demonstrable error or major inconsistency in the existing Plan goal, policy, or map.

GLOSSARY

The following definitions apply to terms as used in the Benton County Comprehensive Plan.

Aggregate: Stone, sand and gravel suitable for use in building and road construction.

Amendment of the Comprehensive Plan: A revision, addition or deletion of a portion of the comprenensive plan text and/or maps.

Aquifer: A body of permeable rock, rock fragments or soil through which ground water moves.

Arterial Road: A major road, the primary function of which is to move relatively large volumes of vehicles, and which carries longer trips from one part of the County to another.

Carrying Capacity: The maximum population of species a particular environment can sustain.

Collector Road: A major road, the primary function of which is to conduct traffic from local roads to arterial roads.

Comprehensive Plan: A generalized, coordinated land use map and policy statement of Benton County which interrelates all functional and natural systems and activities related to the use of land.

Density: The average number of a given thing per unit of area. Generally applied to residential use in terms of dwelling units per acre.

Environment: A collective term for the conditions, circumstances and influences surrounding and affecting the development of organisms.

Goal: A broad statement of intent and philosophy expressing countywide values and attitudes. An adopted policy is the official position of Benton County.

Habitat: A particular kind of environment inhabited by animals and/or plants; the place where they live.

Hobby Farmer: An operator of a small farm or ranchette that is primarily used for family hobbies and/or small business in agriculture, floriculture, horticulture, aquaculture, and/or stock raising.

Industrial Park: A tract of land which is subdivided and/or developed for the use of a group of industries.

Livability: The quality of life in an area.

Local Road: A minor road, the primary function of which is to provide access to property abutting the public right-of-way.

Municipalities: Benton City, Kennewick, Prosser, Richland, West Richland, and any incorporated rural community.

Navigable Water: Waterways capable of supporting commercial ocean-going barge traffic; the Columbia River in Benton County stretching from the Klickitat County line to the Port of Benton docking facilities at Richland.

One Hundred Year Flood: A flood having one percent chance of occurring in any given year.

Perched Water Table: A water body that occupies a basin in impermeable material, located in a position higher than the main water table.

Performance Standard: A criteria for testing the degree of hazard, environmental damage or nuisance from land use activities creating smoke, dust, noise, glare, odor, erosion and sediment, runoff, wastes, fumes, traffic, etc., and used in location of land uses within zones where performance levels of acceptability have been established by ordinance.

Policy: A decision making guideline which provides the basis for specific courses of action to move the County toward attainment of its goals.

Prime Farm Land: Land that as defined by the U.S. Soil Conservation Service has the best combination of physical and chemical characteristics for growing crops.

Recharge Area: An area of permeable ground surface where surface water enters an aquifer.

Riparian: Of, pertaining to, or situated on the bank of a watercourse.

Rural Land Development: Residential development characterized by an average density of one dwelling unit per gross acre of land or less, and agricultural activities.

Subbing: The rise in water table to ground surface as a result of irrigation activity.

Unique Farmland: Land other than prime farmland that is used for the production of specific high value food and fibre crops as identified by the U.S.D.A. Soil Conservation Service.

Update of the Comprehensive Plan: A complete revision of the entire comprehensive plan.

Urban Land Development: Residential development characterized by an average density of more than one dwelling unit per gross acre of land, and commercial activities.

Water Table: The upper surface of an unconfined ground water body.