CITY OF BAKER CITY

TRANSPORTATION SYSTEM PLAN

FINAL REPORT

AUGUST 1996

DAVID EVANS AND ASSOCIATES, INC.

sionals ...
ty

CITY OF BAKER CITY
TRANSPORTATION SYSTEM PLAN REPORT

AUGUST 1996

PREPARED BY:
DAVID EVANS AND ASSOCIATES, INC.
2828 SW CORBETT
PORTLAND, OREGON 97201

PREPARED FOR:
CITY OF BAKER CITY
1655 FIRST STREET
BAKER CITY, OREGON 97814

TABLE OF CONTENTS

INC.

Page

TABLE OF CONTENTS

Page

TABLE OF CONTENTS

Page

DEA INC.

TABLE OF CONTENTS

Page

TABLE OF CONTENTS

Page

LIST OF TABLES

Page

LIST OF FIGURES

INC.

Follows Page

CHAPTER 1: INTRODUCTION

The Baker City Transportation System Plan guides the management of existing transportation facilities and the design and implementation of future facilities for the next 20 years. This Transportation System Plan constitutes the transportation element of the City's Comprehensive Plan and satisfies the requirements of the Oregon Transportation Planning Rule.

PLANNING AREA

The Baker City Transportation System Plan planning area includes Baker City as well as the area within the City's UGB and adjacent areas that are currently developing or that have a strong potential to develop within the 20-year planning period. The planning area is shown on Figure 1-1. Roadways included in the Transportation System Plan fall under several jurisdictions: Baker City, Baker County, and the State of Oregon. Baker City Planning Area

Baker City is the county seat and the largest urban area in Baker County with almost 60% of the County's population. Located in northeastern Oregon about 45 miles southeast of La Grande and 70 miles northwest of Ontario, it is a self-contained community. Baker City provides a variety of residential, shopping, employment, and recreational opportunities within its Urban Growth Boundary *(UGB)* and the surrounding countryside. The area is economically strong, supported by a combination of resource-based industries, agriculture, and a growing tourist trade.

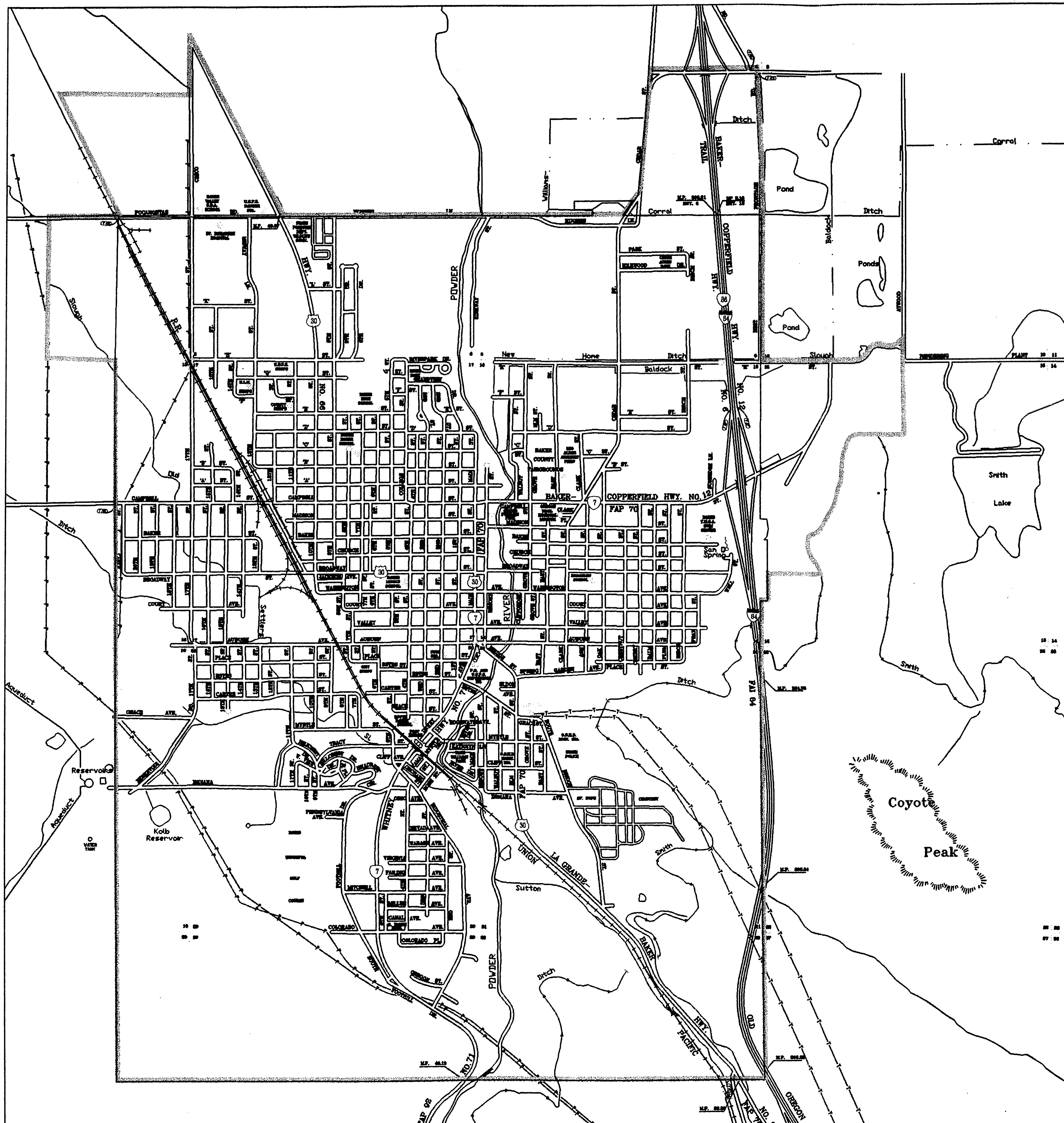
Baker City, like many other smaller communities in Oregon, developed along the state highways serving the region. However, with the construction of Interstate 84 *(I-84)* on its eastern border, most of the conflict between highway traffic and local traffic was eliminated. The result is a healthy community with little traffic congestion and a pedestrian and bicycle friendly environment.

A strong street grid pattern has been maintained in Baker City as it has developed over the years. This grid pattern is interrupted by only two major barriers to traffic. The first is the Powder River which runs north and south through the city. More than ten bridges span the river, minimizing the interference of east-west travel. The railroad, which runs from the northwest corner of the urban area to the southeast corner, is another physical barrier. Highway 7 passes under the railroad, and there are five at-grade crossings.

In addition to I-84 and its three interchanges on the east side, Baker City has three other state highway facilities within the study area. Highway 86 just runs along the northeast border of the UGB before it connects with Interchange 302. Highway 7 enters the city from the south, runs along Dewey Avenue, Main Street, and Campbell Street, and then connects with I-84 at Interchange 304. Highway 30 enters the city from the northwest, running along 10th Street, Broadway Street, Main Street, Bridge Street, and Elm Street, connecting with I-84 at Interchange 306.

A land use zoning map of the Baker City Transportation System Plan planning area is shown on Figure 1-2.

The commercial zones focus around the state highways. Main Street is the center of the downtown business district. The area of densest commercial development occurs where Highways 7 and 30 overlap. Broadway Street and 10th Street are the focus of commercial development as well. With the construction of I-84,



DAVID EVANS AND ASSOCIATES, INC.

NOT TO SCALE

LEGEND

CITY LIMITS

URBAN GROWTH BOUNDARY

FIGURE 1-1

BAKER CITY PLANNING AREA

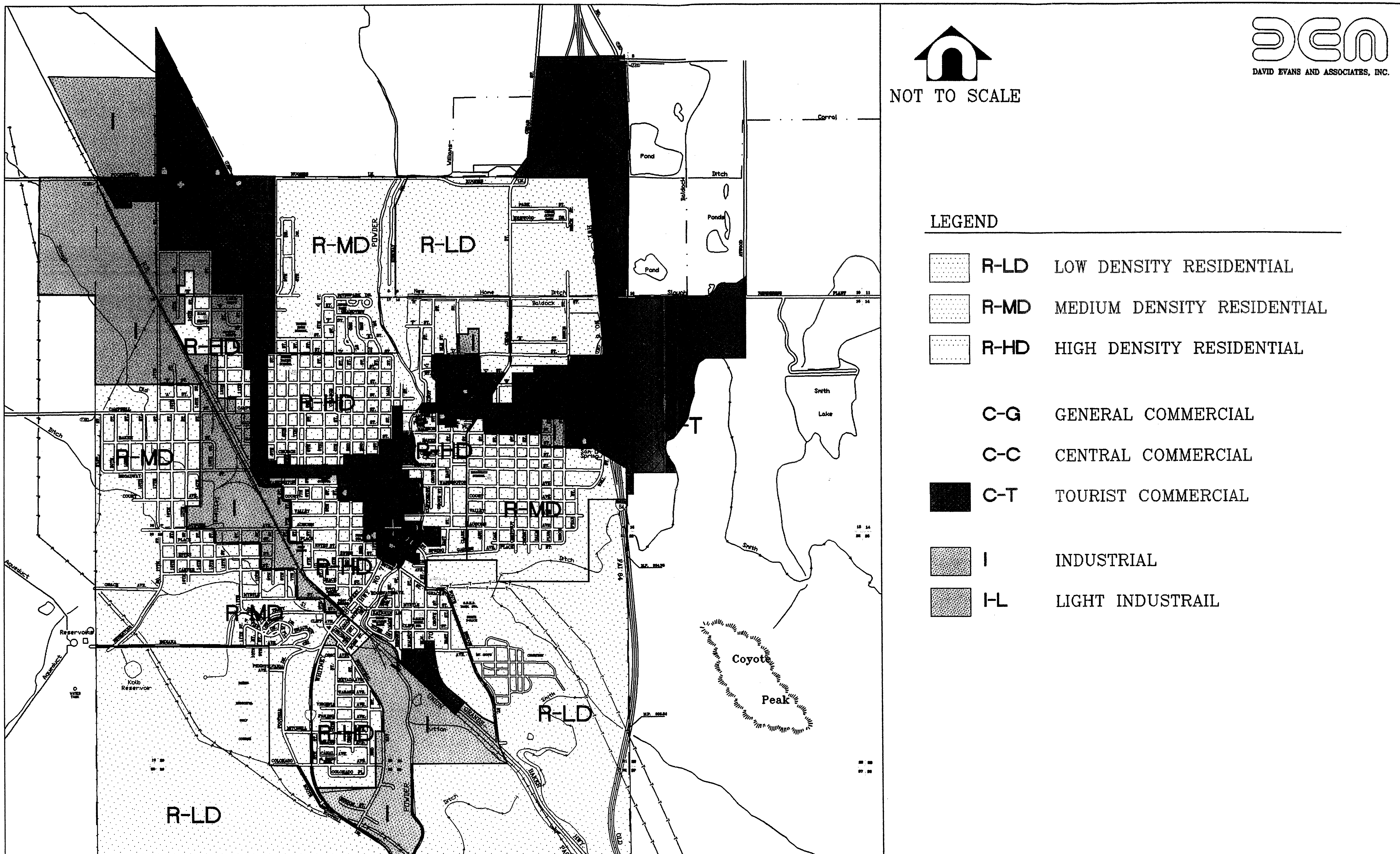


FIGURE 1–2
LAND USE ZONING

Campbell Street also became a commercial center, and it continues to be the fastest area of commercial growth in Baker City. One other major area of commercial zoning is the undeveloped land east of I-84.

Industrial zoning in Baker City is located along the railroad tracks with a few smaller industrial areas in other parts of the city.

The remainder of the city is designated residential with the highest density zoning in the heart of the city, near the commercial districts. Medium and low density residential zoning is located around the perimeter of the urban area.

PLAN ORGANIZATION

The Baker City Transportation System Plan was developed through a series of technical analyses combined with systematic input and review by the City, the TAC, and the public. Key elements of the process include:

- Involving the Baker City community (Chapter 1)
- Defining goals and objectives (Chapter 2)
- Reviewing existing plans and transportation conditions (Chapters 3 and 4; Appendices A and B)
- Developing population, employment and travel forecasts (Chapter 5; Appendix C)
- Developing and evaluating potential transportation system improvements (Chapter 6)
- Developing the transportation system plan (Chapter 7)
- Developing a capital improvement program (Chapter 8)
- Developing Recommended Policies and Ordinances (Separate from this document)

Community Involvement

Community involvement was an important part of developing the Baker City Transportation System Plan. Interaction with the community was achieved through holding open public meetings and by forming a Transportation Advisory Committee (TAC). The TAC functioned as a combination technical and citizen advisory committee, and provided local knowledge, guidance to the consultant team, and review of work products. The TAC consisted of citizens and representatives from Baker City, Baker County and the Oregon Department of Transportation (ODOT). Five TAC meetings were held throughout the plan development process.

Two open community meetings were held in Baker City on January 31, 1995, and March 14, 1996. The first meeting was held at the beginning of the process in a workshop format to solicit public input on issues and problems to be addressed. The results of this meeting formed the basis for the transportation goals and objectives. The second meeting was held at the end of the process for community review and comments upon completion of the draft Transportation System Plan. Two newsletters were published in the Baker City Herald, one in advance of each public meeting. These are included in Appendix B.

Goals and Objectives

Based on input from the City, the TAC, and the community, a set of goals and objectives were defined for the Transportation System Plan. These goals and objectives were used to make decisions about various potential improvement projects. They are described in Chapter 2.

Review and Inventory of Existing Plans, Policies, and Public Facilities

To begin the planning process, all applicable Baker City and Baker County transportation and land use plans and policies were reviewed and an inventory of public facilities was conducted. The purpose of these efforts was to understand the history of transportation planning in the Baker City area, including the street system improvements planned and implemented in the past, and how the City is currently managing its ongoing development. Existing plans and policies are described in Appendix A of this report.

The inventory of existing facilities catalogs the current transportation system. The results of the inventory are described in Chapter 3, while Chapter 4 describes how the system operates. Appendix B summarizes the inventory of the existing arterial and collector street system.

Future Transportation System Demands

The Transportation Planning Rule requires the Transportation System Plan to address a 20-year forecasting period. In accordance with this, 20-year travel forecasts were developed based on projections of population and employment by different land use categories within the Urban Growth Boundary (UGB). The overall travel demand forecasting process is described in Chapter 5. The demographic forecast is described in Appendix C.

Transportation System Potential Improvements

Once the travel forecasts were developed, it was possible to evaluate a series of potential transportation system improvements. The initial evaluation was the "No Build" option, which is the existing street system plus any currently committed street system improvements. Then, transportation demand management measures and potential transportation improvements were developed and analyzed as part of the transportation system analysis. These improvements were developed with the help of the TAC, and they attempt to address the concerns specified in the goals and objectives (Chapter 2). After evaluating the results of the potential improvements analysis, a series of transportation system improvements were selected. These recommended improvements are described in Chapter 6.

Transportation System Plan

The Transportation System Plan addresses each mode of transportation and provides an overall implementation program. The street system plan was developed from the forecasting and potential improvements evaluation described above. The bicycle and pedestrian plans were developed based on current usage, land use patterns, and the requirements set forth by the Transportation Planning Rule. The public transportation, air, water, rail, and pipeline plans were developed based on discussions with the owners and operators of those facilities. Chapter 7 details the plan elements for each mode.

Capital Improvement Program and Funding Options

The capital improvement program was developed from the short-term improvements and the recommended street system plan, while the funding analysis examines options for financing these improvements. These elements are described in Chapter 8.

Recommended Policies and Ordinances

Suggested Comprehensive Plan policies and implementing zoning and subdivision ordinances have been submitted separately from this document.

CHAPTER 2: GOALS AND OBJECTIVES

The purpose of the Transportation System Plan is to provide a guide for Baker City to meet its transportation goals and objectives. The following goals and objectives were developed from information supplied by the Transportation Advisory Committee, City staff, and public response. Throughout the planning process, each element of the plan was evaluated against these parameters.

An overall goal was developed, then more specific goals and objectives were formulated. The goals and objectives are listed below. All of these goals and objectives are addressed in the following plan chapters.

OVERALL TRANSPORTATION GOAL: Develop a transportation system that enhances the livability of Baker City and accommodates growth and development through careful planning and management of existing and future transportation facilities.

- *GOAL 1: Improve and enhance safety and traffic circulation on the local street system.*

  Objectives:

  A. *Preserve and enhance the existing grid street system.*

  B. *Improve and maintain existing roadways to preserve the capacity, level of service, and safety of the existing transportation system.*

  C. *Identify truck routes to reduce truck traffic in the urban area.*

  D. *Examine the need for speed reduction and improved signalization at specific locations.*

  E. *Identify local problem spots and recommend solutions.*

This goal and its objectives are discussed in Chapters 6 and 7.

- *GOAL 2:* Identify roadway system needs to accommodate developing or undeveloped areas without undermining the character of existing neighborhoods.

  Objectives:

  A. Adopt policies and standards that address street connectivity, spacing, and access management.

  B. Integrate new arterials and collectors into the existing grid system.

This goal and its objectives are addressed in Chapters 6, 7 and 8.

- *GOAL 3: Increase the use of alternative modes of transportation (walking, bicycling, and transit) through improved access, safety, and service.*

  Objectives:

  A. *Provide sidewalks and safe crossings on urban arterial and collector streets.*

B. Provide shoulders on rural collectors and arterials.

C. Provide appropriate bikeways where high use occurs or may occur.

D. Provide a safe and efficient system of multi-use paths through the urban area.

E. Promote alternative modes and carpool programs through community awareness and education.

F. Plan for expanded transit service by sustaining funding to local transit efforts and seeking consistent state support.

This goal and its objectives are addressed in Chapters 6, 7, 8, and 9

GOAL 4: *Enhance the role of the Baker City Airport.*

Objectives:

A. Provide commercial air service

This goal is outside the scope of this Transportation System Plan, but it would be considered in a Baker Municipal Airport Master Plan update.

CHAPTER 3: TRANSPORTATION SYSTEM INVENTORY

As part of the planning process, DEA conducted an inventory of the existing transportation system in Baker City. This inventory covered the street system as well as the pedestrian, bikeway, public transportation, rail, air, water, and pipeline systems.

STREET SYSTEM

The most common understanding of transportation is of roadways carrying cars and trucks. Most transportation dollars are devoted to building, maintaining or planning roads to carry automobiles and trucks. The mobility provided by the personal automobile has resulted in a great reliance on this form of transportation. Likewise, the ability of trucks to carry freight to nearly any destination has greatly increased their use.

Encouraging the use of cars and trucks must be balanced against costs, livability factors, the ability to accommodate other modes of transportation, and negative impacts on adjacent land uses; however, the basis of transportation in all American cities is the roadway system. This trend is clearly seen in the existing Baker City transportation system, which consists almost entirely of roadway facilities for cars and trucks. The street system will most likely continue to be the basis of the transportation system for at least the 20-year planning period; therefore, the emphasis of this plan is on improving the existing street system for all users.

The existing street system inventory was conducted for all highways, arterial roadways, and collector roadways within Baker City as well as those in Baker County that are included in the Transportation System Plan planning area. Inventory elements include:

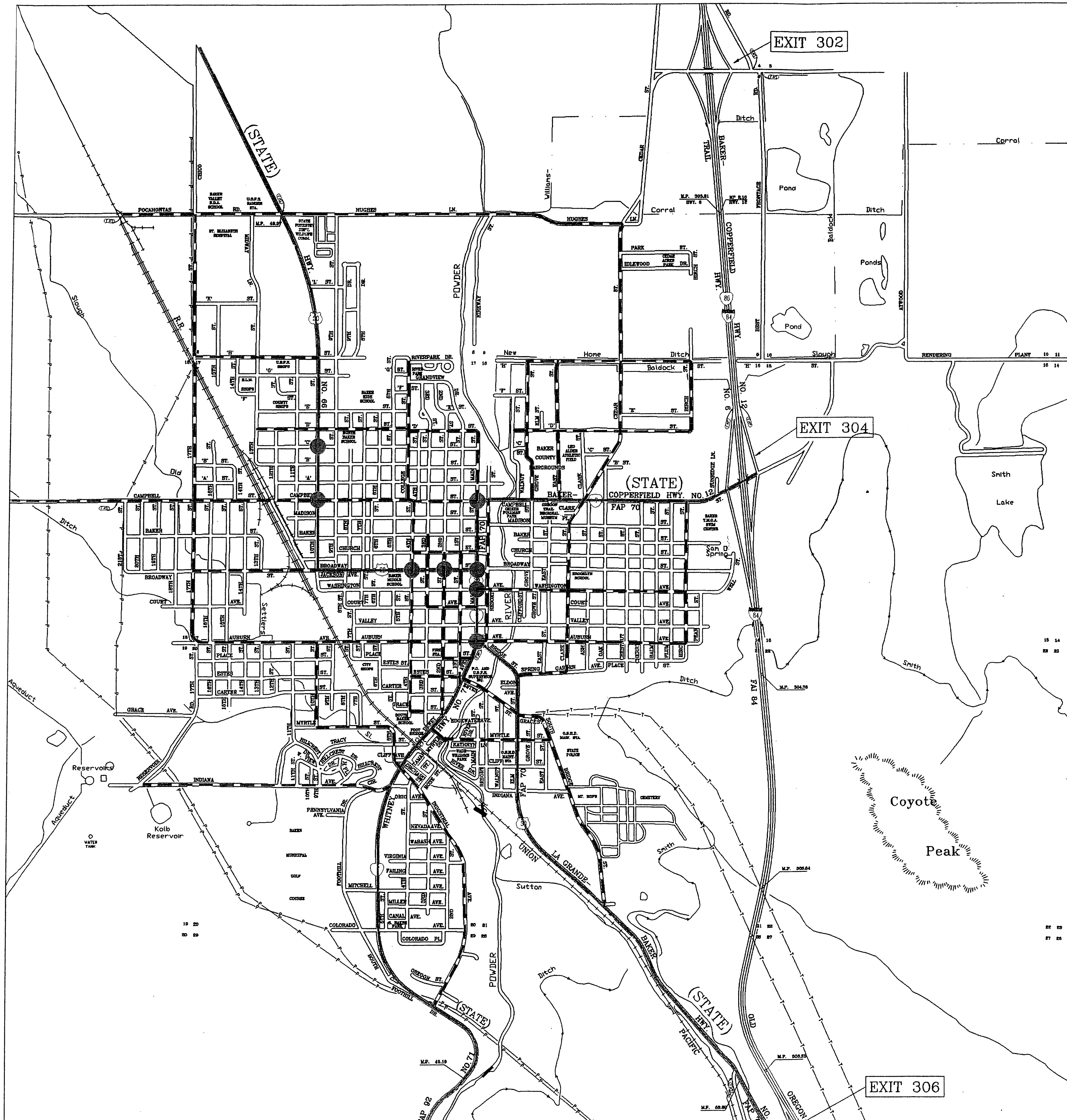
- street classification and jurisdiction
- street width and right-of-way
- number of travel lanes
- presence of on-street parking, sidewalks, or bikeways
- speed limits
- general pavement conditions

Figure 3-1 shows the roadway functional classification and jurisdiction, as well as the location of traffic signals. Appendix D lists the complete inventory.

State Highways

Discussion of the Baker City street system must include the State highways that traverse the planning area. Although Baker City has no direct control over the State highways, adjacent development as well as traffic patterns are heavily influenced by the highways. Baker City is served by four State highways: Interstate 84, Highway 30, Highway 7, and Highway 86. These highways serve as the major routes through town with commercial and industrial development focused along the corridors.

The 1991 Oregon Highway Plan (OHP) classifies the state highway system into four levels of importance (LOI): Interstate, Statewide, Regional, and District. ODOT has established primary and secondary functions for each type of highway and objectives for managing the operations for each one.



NOT TO SCALE

DAVID EVANS AND ASSOCIATES, INC.

LEGEND

- ARTERIAL
- COLLECTOR
- TRAFFIC SIGNAL

FIGURE 3-1

1995 STREET CLASSIFICATION, JURISDICTION AND TRAFFIC SIGNALS

Baker City has one highway of regional significance (7) and two highways of district significance (30 and 86) in addition to the interstate. According to the OHP, the primary function of a regional highway is to "provide connections and links to areas within regions of the state, between small urbanized areas and larger population centers, and to higher level facilities." Within urbanized areas, a secondary function is "to serve land uses in the vicinity of these highways." The primary function of a district highway is to "serve local traffic and land access." For both types of highways, the emphasis on these highways is to preserve safe and efficient higher speed through travel in rural areas, and moderate to low-speed operations in urban or urbanizing areas. This means that design factors such as controlling access and providing passing lanes are of primary importance.

Interstate 84

Interstate 84 runs north/south along the eastern boundary of Baker City with three interchanges providing access to the city. This route is the fastest and most direct route to major metropolitan areas such as Portland, Oregon or Boise, Idaho.

The northernmost interchange, Exit 302, lies in the northeast corner of the Baker City urban area. It connects with Highway 86, providing access to the Oregon Trail Visitor Center to the east. It also connects with Cedar Street to the west, which provides local access into the city, and Hughes Lane, which provides access to the North Baker Business District.

The most highly used interchange, Exit 304, connects with Campbell Street and Highway 7. It provides access to both tourist and general commercial land uses and also connects to the fastest route into downtown Baker City.

The southernmost interchange, Exit 306, lies just south of the urban area. It connects with Highway 30 for access to downtown Baker City. This interchange is primarily used by travelers to and from the east.

Highway 7

Highway 7 is a highway of regional significance, connecting Baker City with other communities in western Baker County. It also connects with Highway 26 for additional access to Central and Eastern Oregon.

Within the Baker City urban area, Highway 7 runs along several local streets. Starting from its interchange with I-84, it runs east-west along Campbell Street, turns south onto Main Street, and continues south on Dewey Avenue. On Campbell Street, Highway 7 is a four-lane roadway serving adjacent commercial land uses with many driveway accesses and on-street parking. It also has frequent intersections with both local and collector streets which provide access to residential neighborhoods. On Main Street, Highway 7 is part of a well developed grid system that serves as the downtown core of Baker City. It is a four-lane roadway with on-street parking with fewer driveways because of the older commercial development present downtown. On Dewey Avenue, Highway 7 is a two-lane roadway with fewer intersections and increasing speeds as it heads south out of the urban area.

Highway 30

Highway 30 is a highway of district significance which runs parallel with I-84 between Baker City and North Powder, about 15 miles to the north. It also serves the community of Haines, about 10 miles away.

Within Baker City, Highway 30 runs from the northwest corner to the southeast corner of the urban area. Beginning from the northwest, it runs north-south along 10th Street, turns east onto Broadway Street, turn south and joins Highway 7 on Main Street, runs east for one block on Auburn Avenue, turns south again on Bridge Street, and continues south on Elm Street. On 10th Street, Highway 30 increases from two to four lanes with many driveway accesses and on-street parking. It serves adjacent commercial land uses. It also has frequent intersections with both local and collector streets which provide access to residential neighborhoods and industrial areas. On both Broadway Street and Main Street, Highway 30 is part of a well developed grid system that serves downtown Baker City. It is a four-lane roadway with on-street parking with fewer driveways because of the older commercial development present downtown. On Bridge and Elm Streets, Highway 30 is a two-lane roadway with fewer intersections and increasing speeds as it heads south to its interchange with I-84.

Highway 86

Highway 86 runs only briefly in Baker City from its interchange with I-84 east out of the urban area. It provides access to the Oregon Trail Visitors Center and other communities in east Baker County such as Richland and Halfway. It also connects with the south end of the Hells Canyon National Recreation Area on the Snake River.

Highway 86 has little adjacent land activity within the Baker City urban area. However, it connects with Best Frontage Road, which does run through land that is presently zoned for commercial usage, although it is currently undeveloped.

Street Classification

Baker City has classified their street system at three levels: arterial streets, collector streets, and local streets. The classification system includes city, county and state roadways.

Arterial Streets

Arterial streets form the primary roadway network within and through a region. They provide a continuous road system which distributes traffic between neighborhoods and districts. Generally, arterial streets are high capacity roadways which carry high traffic volumes with minimal localized activity.

In Baker City, the arterial network consists of two State highways: Highways 30 and 7. These roadways, as described previously serve as the focus for most of the commercial development in the city. They are two-lane roadways in the less densely developed areas and four-lane roadways with on-street parking through the commercial areas.

Collector Streets

Collector streets connect local neighborhoods or districts to the arterial network. Baker City has 36 designated collector streets. Within the study area limits, collector streets include the following:

Auburn Avenue	East Street	Resort Street
Birch Street	Estes Street	South Bridge Street
Broadway Street	Grace Street	Spring Garden Avenue
Campbell Street	Grove Street	Valley Avenue
Cedar Street	H Street	Washington Avenue
Church Street	Hughes Lane	1st Street
Clark Street	Indiana Avenue	2nd Street
College Street	Main Street	3rd Street
Colorado Street	Myrtle Street	4th Street
Court Street	Place Street	5th Street
D Street	Pocahontas Road	10th Street
David Eccles Road	Reservoir Road	17th Street

Local Streets

Local streets form the majority of the street system in Baker City. They are designed to carry the very low traffic volumes associated with the local uses which abut them. In Baker City, the local streets help form part of the grid system; however, they are not intended to function as alternate routes to the arterial and collector street system.

Street Layout

The majority of the Baker City streets are positioned in a grid pattern. Block sizes vary but are typically 330 feet square. Several natural features interrupt the grid system, causing discontinuities and odd shaped blocks. These features include the Powder River, Settlers Slough and Sutton Creek. Manmade features such as Geiser Pollman Park, Mt. Hope Cemetery, Baker County Fairgrounds, the Union Pacific Railway and school lots divide up the city.

One of the major circulation barriers is the Powder River, which runs south to north through town just east of Resort Street. There are 10 river crossings spaced two to three blocks apart. The crossings include: Hughes Lane, Campbell Street, Madison Street, Broadway Street, Washington Street, Valley Avenue, Auburn Avenue, Bridge Street, Estes Street and Myrtle Street.

PEDESTRIAN SYSTEM

The most basic transportation option is walking. Walking is the most popular form of exercise in the United States and can be performed by people of all ages and all income levels. However, it is not often considered as a means of travel. This is mainly because pedestrian facilities are generally an afterthought and not planned as an essential component of the transportation system.

The relatively small size of Baker City indicates that walking could be employed regularly to reach a variety of destinations. Encouraging pedestrian activities may not only decrease the use of the personal automobile but may also provide benefits for retail businesses. Where people find it safe, convenient, and pleasant to walk, they may linger and take notice of shops that were overlooked before. They may also feel inclined to return to renew the pleasant experience time and again.

As is typical of most towns the size of Baker City, the sidewalk system in the older core of the city is relatively complete (see Figure 3-2). In the rough area located east of the railroad tracks, south of Campbell Street and north of Auburn Avenue, the completeness of the sidewalk system combined with the small blocks and well-developed grid system makes Baker City one of the most walkable cities in Eastern Oregon.

Sidewalks and other pedestrian facilities are notably lacking west of the railroad tracks and in the area surrounding the fairgrounds. Curb cuts for wheelchair access are found fairly consistently on Main and Broadway Streets, and in the eastern portion of town, but are largely lacking in other areas.

A 3-8 foot shoulder has been added to the west side of Cedar Street from the vicinity of Campbell Street north to Hughes Lane. The shoulder is signed "Pedestrian Path" and "Bike Route."

BIKEWAY SYSTEM

Like pedestrians, bicyclists are often overlooked when considering transportation facilities. Bicycles are thought of by many as children's toys. However, cycling is a very efficient mode of travel. Bicycles take up little space on the road or parked, do not contribute to air or noise pollution, and offer relatively higher speeds than walking. Because of the small size of Baker City, a cyclist can travel to any destination in town within a matter of minutes.

Bicycling should be encouraged to reduce the use of automobiles for short trips in order to reduce some of the negative aspects of urban growth. Noise, air pollution, and traffic congestion could be mitigated if more short trips were taken by bicycle or on foot. Typically, a short trip that would be taken by bicycle is around 2 miles; on foot, the distance commonly walked is around ½ mile.

Baker City currently has no sanctioned bikeways, except for the shoulder along the west side of Cedar Street; bicyclists must share the roadways with motorized vehicles. On low volume roadways, such as many of the local streets, bicyclists and autos can both safely and easily use the roadway. On higher volume roadways, particularly the arterial streets, safety for the bicyclists is an important issue.

Separated pathways exist on either side of the city, but these are generally reserved for pedestrians. No signing is used to encourage the use of these pathways for bicycles.

Another impediment to bicycle use is the lack of parking and storage facilities for bikes throughout the Baker City area.

PUBLIC TRANSPORTATION

Public transportation in Baker City consists of a taxicabs, intercity bus lines and rail services, as well as senior citizen and handicapped transport. The city has no local fixed route transit service at this time.

Greyhound bus lines serve Baker City, providing daily service. Eastbound travelers would depart the Baker Truck Corral (515 Campbell Street) at 8:35 am and 11:00 PM. Westbound travelers would depart at 5:20 am and 6:35 PM.

Area Aging Services provides three 12-passenger vans, one 12-passenger minibus with wheel chair lift, one 20-passenger bus and one 6-passenger mini-van. They provide "Dial-A-Ride" services which cost $0.50/ride within Baker City limits and $1.00/ride outside of the Baker City limits.

AMTRAK also services Baker City. The "Pioneer Train" departs the terminal westbound for Portland/Seattle at 6:28 am on Tuesday, Thursday, and Sunday. Eastbound departures to Denver occur at 6:58 am on Monday, Wednesday and Saturday.

The small size and low traffic volumes on city streets indicate that mass transit is not currently necessary. A citywide public transportation program would not be economically feasible at this time. The Transportation Planning Rule exempts cities of less than population 25,000 from including mass transit facilities in their development regulations. However, Baker City can plan for future transit services with growth patterns that support rather than discourage transit use in the future.

RAIL SERVICE

The Union Pacific Railroad Company's main east-west line passes through the heart of town. Regional and transcontinental destinations are available daily. Rail services include[1]:

- daily switching offered (seven days per week; twice per day on weekdays)
- piggyback ramp service-available in Hinkle, Oregon and Nampa, Idaho
- freight rates-available on request
- This connection allows customers to ship goods to domestic and international destinations.

In addition to the freight service provided by Union Pacific Railroad, AMTRAK passenger rail service is also available. The details of the passenger service are provided in the "Public Transportation" section of this chapter.

AIR SERVICE

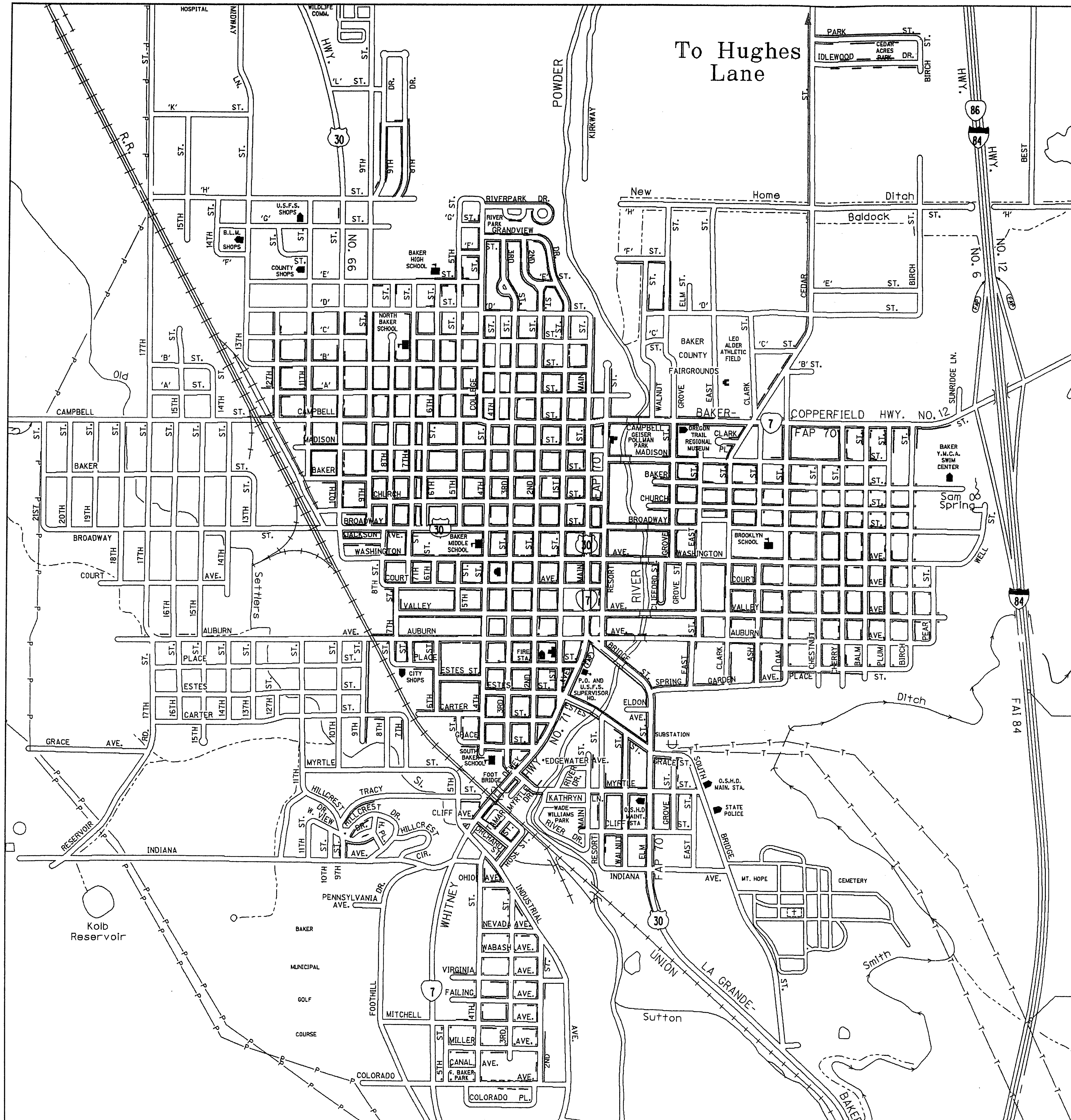
Baker County is serviced by the Baker Municipal Airport. The Baker Municipal Airport is at an elevation of 3,370 feet above Mean Sea Level (MSL). The airport is located conveniently 4.5 miles from downtown Baker City and has three runways:

- NW-SE: 5,100 feet long
- N-S: 3,400 feet long
- E-W: 4,200 feet long

Airport services include:

- instrument landing system: VOR DME
- lighting system: VASI
- main runway: Medium Intensity System

[1] Baker City and Baker County, *1993/1994 Community Profile*, City/County of Baker Economic Development department, 1994.



NOT TO SCALE

DAVID EVANS AND ASSOCIATES, INC.

LEGEND

SIDEWALK

CURB RAMP

FIGURE 3-2
PEDESTRIAN SYSTEM INVENTORY

- hangars: 5 corporate aircraft, 20 private aircraft, 4 city-owned hangars
- fixed base operator: Baker Aircraft offers 24 hour fuel, oil, repairs, jet fuel, charter and air ambulance. The charter service includes 9 aircraft (including light-single and turbo-prop aircraft) and 6 full-time pilots
- courtesy cars: rental cars are available from Phillips Long Ford and Ellison Chevrolet
- Baker Aircraft can easily estimate the time and cost of any flight

The airport currently provides no commercial air service. The Boise Air Terminal, 128 miles from Baker City, is the closest large commercial airport. Scheduled air service and daily non-stop flights are available throughout the western United States.

Because the Baker Municipal Airport is governed by its own master plan, recommendations for its improvement do not fall into the scope of this Transportation System Plan. However, the airport is an essential part of the economy of the area. It is necessary to include the airport when considering future development proposals for the surrounding land. In many localities, uses have been allowed around airports that are not compatible with air traffic.

PIPELINE SERVICE

Although not often considered as transportation facilities, pipelines carry liquids and gases very efficiently. The use of pipelines can greatly reduce the number of trucks and rail cars carrying fluids such as natural gas, oil, and gasoline.

Cascade Natural Gas Corporation provides natural gas to the Baker County area. The source of the gas is the southwestern United States and Canada pipeline. The distribution line extends from southeastern to northwestern Baker City skirting around the west side of the existing street system.

Chevron Pipeline Company owns a pipeline which runs parallel to the natural gas pipeline. This pipeline originates in Salt Lake City, Utah and continues to Spokane, Washington with a connection in Pasco, Washington. It carries a variety of finished petroleum products, including gasoline, jet fuel, and diesel fuel. This pipeline has no local access in Baker City.

WATER SERVICE

Baker City has no waterborne transportation services.

CHAPTER 4: CURRENT TRANSPORTATION CONDITIONS

As part of the planning process, the current operating conditions for the transportation system were evaluated. This evaluation focused primarily on street system operating conditions since the automobile is by far the dominant mode of transportation in Baker City. Census data was examined to determine travel mode distributions.

1994 TRAFFIC VOLUMES

A large base of traffic volume counts exists for Baker City. Extensive 24-hour counts were performed throughout the street system in 1990. ODOT conducted turning movement counts at most of the intersections on Campbell Street between Main Street and I-84 during the spring and summer of 1992. To supplement this information additional traffic volumes on the major streets in Baker City were measured in the February and March of 1995. The 1990 and 1992 counts were updated based on historic traffic growth over the last 5 years and combined with the more recent traffic counts to develop the traffic volume figures presented in this chapter.

Average Daily Traffic

The Average Daily Traffic (ADT) on the major streets in Baker City is shown in Figure 4-1. Traffic volumes are highest on the state highways and lowest on collector streets serving residential areas.
Highway 7 carries the greatest volumes in Baker City. Traffic volumes on Campbell Street range from 7,500 vehicles per day (vpd) near the I-84 interchange to 11,000 vpd near Resort Street. Highway 7 volume ranges on Main Street are similar to those on Campbell Street. Near Broadway volumes are about 10,800 vpd dropping to 7,250 near Auburn Avenue. Volumes on Highway 7 continue to drop off further south to less than 2,000 vpd at the city limits.

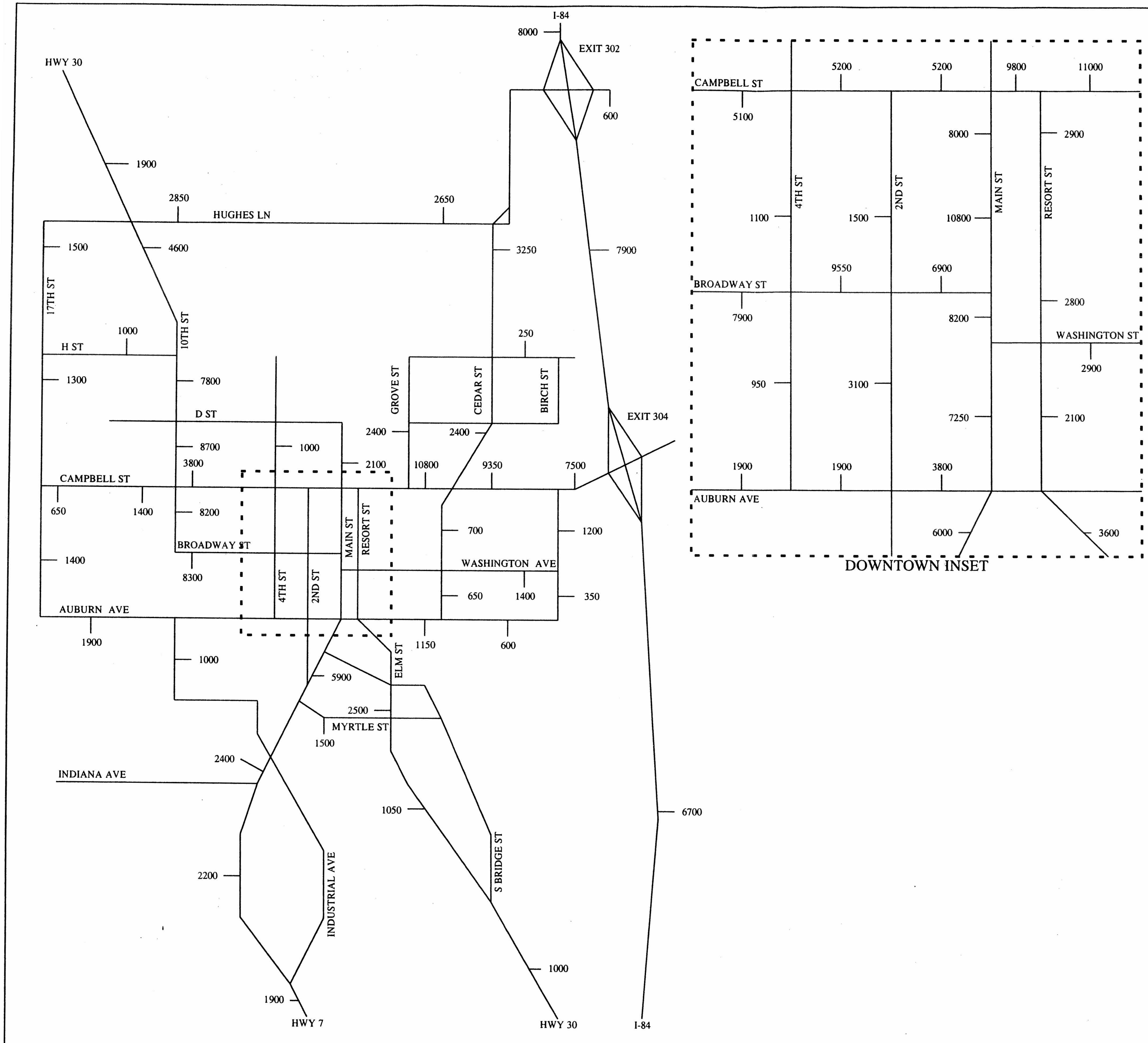
Highway 30 also carries high traffic volumes. On both 10th Street and Broadway, volumes range from about 7,000 to 9,500 vpd. At its northern and southern extremes, volumes on Highway 30 are much lower: about 1,000 vpd at the south city limits and 1,900 vpd at the north city limits.

Of the collector roadways in Baker City, Campbell Street between 10th and Main Streets carries the highest volumes ranging from 3,800 to 5,200 vpd. Cedar Street and Hughes Lane also carry volumes over 2,500 vpd. Most other collector streets in Baker City carry less than 2,000 vpd.

The volumes shown on Figure 4-1 and other volume figures are average volumes for the year. Summertime is the season when volumes are highest. During the summer season, volumes are generally about 20 percent higher than average volumes.

Hourly Traffic Patterns

Generally, traffic volumes on Baker City roadways have two peaks each day, one around lunch time and one in the late afternoon. Peak hour volumes vary from about 8 to 11 percent of the total daily traffic volumes. Off-peak hours are usually more than 15 percent lower than peak hour volumes.



LEGEND

— 2900 COMBINED NORTHBOUND AND SOUTHBOUND 24-HOUR TWO-WAY TRAFFIC VOLUME

| 2900 COMBINED EASTBOUND AND WESTBOUND 24-HOUR TWO-WAY TRAFFIC VOLUME

FIGURE 4-1
1995 WEEKDAY 24-HOUR TWO-WAY
TRAFFIC VOLUMES

Hourly traffic patterns at a key intersection in Baker City are shown in Figure 4-2. These patterns are based on 16-hour traffic volumes measured by ODOT at the intersection of Main Street and Campbell Street. This location was selected because it is identified as one of the high activity spots in the city.
On Main Street, northbound traffic volumes grow gradually throughout the day, with two peaks from 12:00 to 1:00 pm and again from 4:00 to 5:00 pm. After 6:00 pm, traffic activity decreases rapidly. During the peak time periods, about 300 vehicles travel northbound between Madison and Campbell Streets. Only one other hour during the day has a volume within 10 percent of the peak volumes.

Southbound traffic volumes on Main Street were measured between A and Campbell Streets. They are generally much lower than the northbound volumes because they are off the arterial street system. Two peaks occur from 11:00 am to 12:00 pm and again from 3:00 to 4:00 pm. Volumes during these peaks approach 100 vehicles.

On Campbell Street, both eastbound and westbound traffic volumes follow a typical pattern, growing gradually throughout the day to the PM peak period and then dropping off rapidly after 6:00 pm. Westbound traffic has its highest peak from 12:00 to 1:00 pm when lunch time activities focused on Campbell Street are occurring. At this time, about 425 vehicles were measured. Westbound traffic activity is high again from 3:00 to 6:00 pm with volumes measured from 350 to 400 vehicles.

Eastbound traffic volumes on Campbell Street were measured between 1st and Main Streets and are somewhat lower because they are off the arterial street system. Volumes peak between 3:00 and 4:00 pm at about 260 vehicles.

Weekday PM Peak Hour Volumes

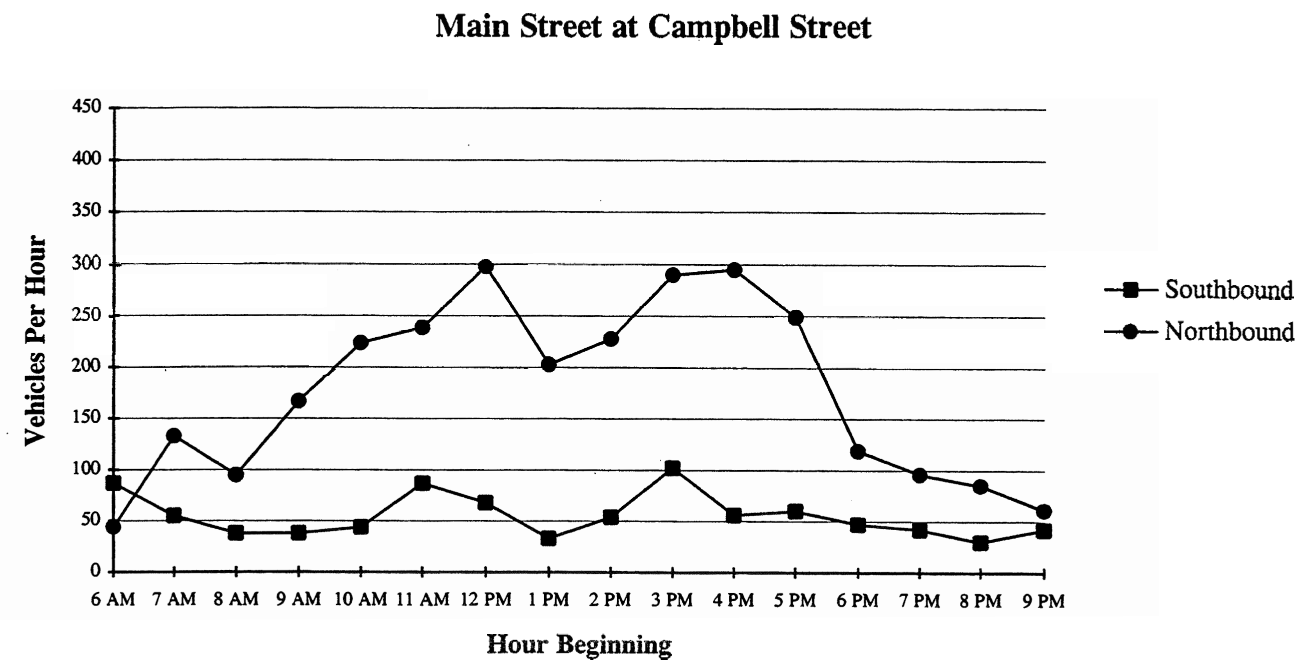
From the hourly traffic patterns, the period of highest activity can be discerned as occurring between 3:00 and 5:00 PM; therefore, testing and evaluation of the street system was based on PM peak hour volumes.

Directional PM peak hour volumes are shown on Figure 4-3. The traffic pattern for the peak hour is similar to the daily traffic patterns. Volumes are highest on the state highways. Volumes on these roadways steadily increase as the roadways approach the downtown core from the boundaries of the study area.

Through Traffic

Through traffic on the I-84 ramps and the other state highways was measured by comparing license plates of vehicles entering and exiting the city during the PM peak period. Recorders were stationed at locations immediately outside of the study area on each leg of the highways and ramps. License plates of vehicles entering the city were then compared with those plates of vehicles exiting the city to calculate the number of through trips. Vehicles which passed through Baker City in under one hour were considered to be through traffic.

Through traffic volumes in Baker City account for a very small percentage of the overall traffic demand. During the PM peak hour, only 452 vehicles were measured traveling through the city. Most of this traffic, 379 vehicles, was traveling through the city on I-84. The remaining 73 vehicles generally used the state highway system when traveling in Baker City. At the outskirts of the city, through traffic accounted for about 15 percent of the traffic entering the city. As volumes increased in the core of the city, through traffic generally accounted for less than 5 percent of the total traffic.



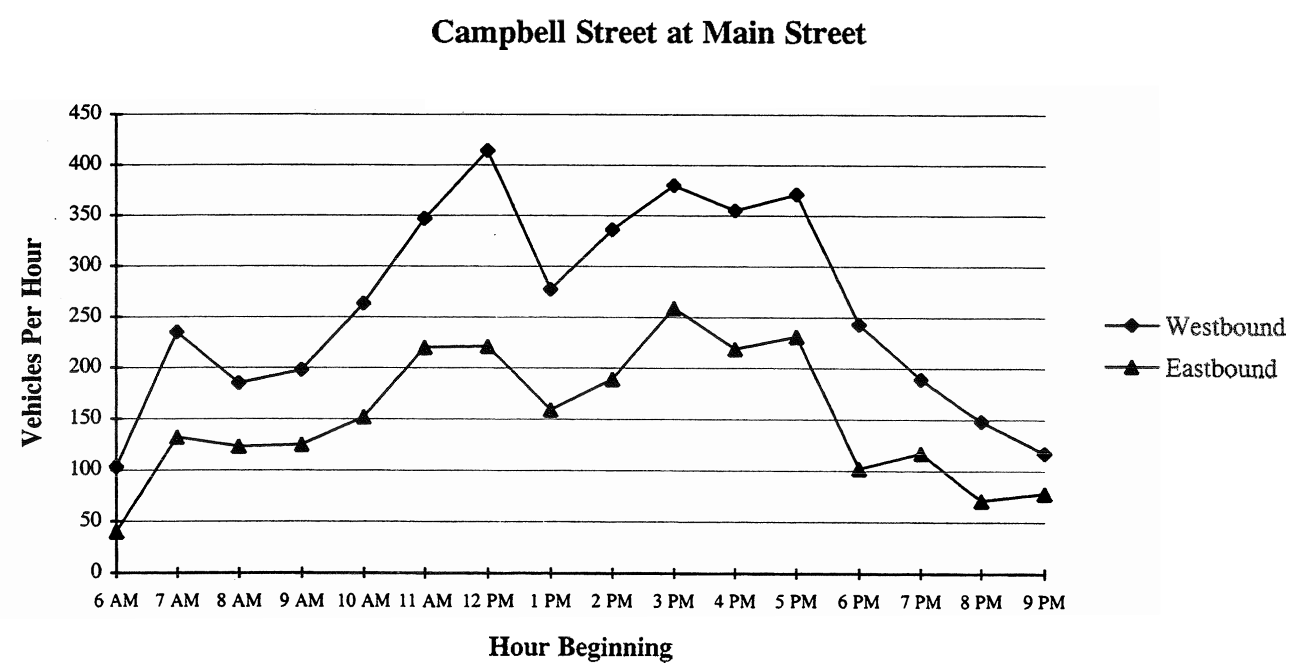


FIGURE 4-2
HOURLY TRAFFIC PATTERNS

Average Trip Lengths

Average trip lengths in a community are affected by many factors including size, zoning, and street connectivity. Baker City zoning is generally well planned, with a mix of land uses in all quadrants of the city. The community is fairly small in size, about 3 miles north to south and about 2 miles east to west. Baker is densely developed around a grid system with few barriers and good connectivity. Based on these characteristics, the expected average trip length would be about 1 to 1½ miles.

From the calibrated model of 1995 traffic volumes, average trip lengths can be estimated (See Table 4-1). More than 8% of the total trips are passing through Baker City without stopping. Another 13 to 14% are trips that begin in Baker City and end elsewhere, or begin somewhere else and end in Baker City. The remaining 78% stay within the study area for their entire trip.

Table 4-1
1994 Average Trip Lengths

Trip Type/Length	Number of Trips	Percentage of Total	Percentage of Total within Baker City
All Within the Study Area			
Up to 1/4 mile	632	11.6%	14.8%
1/4 to 1/2 mile	1,362	25.0%	32.0%
1/2 mile to 1 mile	1,988	36.5%	46.6%
1 mile to 2 miles	283	5.2%	6.6%
Subtotal	4,265	78.3%	100.0%
One End of Trip within the Study Area	730	13.4%	
Through Trips	452	8.3%	
Total Trips	5,447	100.0%	

Note: Through trips include trips on I-84 which pass through the study area without stopping.

Of the trips that are entirely within the study area, all trips are two miles or less in length. Approximately 37% are less than ½ mile in length, a distance that can be covered by a pedestrian in less than 15 minutes and by a bicyclist in approximately five minutes. Almost 73% of the trips within the city are less than one mile in length, a distance which could be covered by a pedestrian in less than 25 minutes and by a bicyclist in less than 10 minutes. Another 5% of the trips are between one and two miles in length. Any of these trips would take a bicyclist traveling 10 mph less than 20 minutes.

1995 Street Capacity

Transportation engineers have established various standards for measuring traffic capacity of roadways or intersections. Each standard is associated with a particular level of service (LOS). The LOS concept requires consideration of factors that include travel speed, delay, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort and convenience and operating cost. Six standards have been established ranging from Level A where traffic flow is relatively free-flowing, to Level F, where the street system is totally saturated with traffic and movement is very difficult. Table 4-2 presents the level of service criteria for arterial roadways.

Table 4-2
Level of Service Criteria for Arterial and Collector Streets

Service Level	Typical Traffic Flow Conditions
A	Relatively free flow of traffic with some stops at signalized or stop sign controlled intersections Average speeds would be at least 30 miles per hour.
B	Stable traffic flow with slight delays at signalized or stop sign controlled intersections. Average speed would vary between 25 and 30 miles per hour.
C	Stable traffic flow with delays at signalized or stop sign controlled intersections. Delays are greater than at level B but still acceptable to the motorist. The average speeds would vary between 20 and 25 miles per hour.
D	Traffic flow would approach unstable operating conditions. Delays at signalized or stop sign controlled intersections would be tolerable and could include waiting through several signal cycles for some motorists. The average speed would vary between 15 and 20 miles per hour.
E	Traffic flow would be unstable with congestion and intolerable delays to motorists. The average speed would be approximately 10 to 15 miles per hour.
F	Traffic flow would be forced and jammed with stop and go operating conditions and intolerable delays. The average speed would be less than 10 miles per hour.

Source: Transportation Research Board, *Highway Capacity Manual*, Special Report 209. National Research Council, 1985.

The Oregon Highway Plan (OHP) establishes operating level of service standards for the State highway system[2]. Highways of regional importance, such as Highway 7, should operate at LOS D or better (i.e. average speeds between 15 and 20 mph) in urban areas and LOS C or better in urbanizing area (i.e. average speeds between 20 and 25 mph). For highways of district importance, such as Highways 30 and 86, the roadways should also operate at LOS D in both urban and urbanizing areas.

The operations at critical intersections in Baker City were calculated for the Weekday PM Peak Hour (see Table 4-3). An average condition and a summer condition were both evaluated. Summer traffic volumes were assumed to be about 20 percent higher than average traffic volumes.

[2] 1991 Oregon Highway Plan, Appendix A, Table 1, *Operating Level of Service Standards for the State Highway System.*

Table 4-3
Summary of Operations at Critical Intersections

Location	Movement	1995 Average	1995 Summer
Campbell St & Oak St	Eastbound; Left	A	A
	Westbound; Left	A	A
	Northbound; Left, Through, Right	C	D
	Southbound; Left, Through, Right	C	D
Campbell St & Cedar St	Eastbound; Left	A	A
	Westbound; Left	A	A
	Northbound; Left, Through, Right	B	C
	Southbound; Left, Through, Right	A	A
Campbell St & Grove St	Eastbound; Left	A	A
	Westbound; Left	A	A
	Northbound; Left, Through	B	C
	Northbound; Right	A	A
	Southbound; Left, Through, Right	A	B
Campbell St & Resort St	Eastbound; Left	A	A
	Westbound; Left	A	A
	Northbound; Left, Through	D	E
	Northbound; Right	A	A
	Southbound; Left, Through, Right	D	E
Campbell St & Main St	All	B (42% of capacity)	B (52% of capacity)
Campbell St & 4th/College St	Eastbound; Left, Through, Right	B	B
	Westbound; Left, Through, Right	B	B
	Northbound; Left, Through, Right	B	B
	Southbound; Left, Through, Right	B	B
Campbell St & 10th St	All	B (28% of capacity)	B (35% of capacity)
Campbell St & 17th St	Eastbound; Left	A	A
	Westbound; Left	A	A
	Northbound; Left, Through, Right	A	A
	Southbound; Left, Through, Right	A	A
Broadway St & Main St	All	B (35% of capacity)	B (43% of capacity)
Broadway St & 2nd St	All	B (27% of capacity)	B (32% of capacity)
Broadway St & 4th St	All	A (17% of capacity)	A (21% of capacity)
Washington St & Resort St	Eastbound; Left, Through, Right	A	B
	Westbound; Left, Through, Right	A	B
	Northbound; Left	A	A
	Southbound: Left	A	A
Washington St & Main St	All	B (23% of capacity)	B (27% of capacity)
Washington St & 4th St	Eastbound; Left	A	A
	Westbound; Left	A	A
	Northbound; Left, Through, Right	A	A
	Southbound; Left, Through, Right	A	A
Auburn Ave & Main St	All	B (34% of capacity)	B (43% of capacity)
Auburn Ave & 4th St	Eastbound; Left	A	A
	Westbound; Left	A	A
	Northbound; Left, Through, Right	A	A
	Southbound; Left, Through, Right	A	A

Notes: The Level of Service is shown for all movements of the unsignalized intersections. At signalized intersections, the overall Level of Service is shown for the intersection together with the overall volume-to-capacity ratio.

In general, the intersections currently operate very well. Traffic on the arterial streets flows smoothly and operates at LOS B or better. There is one location where delays are higher: Resort Street at Campbell Street.

Traveling through on Resort Street or making a left turn movement from Resort Street to Campbell Street is difficult because of the high east-west volumes. The delayed left-turning vehicles hold up the other vehicles that may want to make a right turn onto Campbell Street. This condition has been alleviated for northbound traffic by providing a separate right-turn lane; however, southbound vehicles still share one lane for all movements.

TRANSPORTATION DEMAND MANAGEMENT MEASURES

In addition to inventorying the transportation facilities in Baker City, transportation demand management measures that are currently in place were also reviewed.

Alternative Work Schedules

One way to maximize the use of the existing transportation system is to spread peak traffic demand over a several hours instead of a single hour. Statistics from the 1990 Census show the spread of departure to work times over a 24-hour period (see Table 4-4). Almost one third of the total employees depart for work between 7:00 and 8:00 am. Another third depart in either the hour before or the hour after the peak.

Table 4-4
Departure To Work Distribution

	1990 Census	
Departure Time	**Trips**	**Percent**
12:00 am to 4:59 am	142	4.4
5:00 am to 5:59 am	232	7.2
6:00 am to 6:59 am	492	15.2
7:00 am to 7:59 am	1,040	32.1
8:00 am to 8:59 am	592	18.3
9:00 am to 9:59 am	185	5.7
10:00 am to 10:59 am	55	1.7
11:00 am to 11:59 am	44	1.4
12:00 pm to 3:59 pm	257	7.9
4:00 pm to 11:59 pm	199	6.1
Total	3,238	100.0

Source: *U.S. Bureau of Census*

Assuming an average 9-hour work day, the corresponding afternoon peak can be determined for work trips. Using this methodology, the peak work travel hour would occur between 4:00 and 5:00 pm which corresponds with the peak hour of activity measured for traffic volumes

TRAVEL MODE DISTRIBUTION

Although the automobile is the primary mode of travel for most residents in the Baker City area, some other modes are used as well. Modal split data is not available for all types of trips; however, the 1990 census data does include statistics for journey to work trips as shown in Table 4-5.

Most Baker City residents travel to work via a private vehicle. In 1990, 87.2% of all trips to work were in an auto, van, or truck. Trips in single-occupancy vehicles made-up 75.7% of all trips, and carpooling accounted for 11.5%.

Bicycle usage was higher than many other communities (approximately 2.6%) in 1990. Since the census data does not include trips to school or other non-work activities overall bicycle usage may be even greater. There are few roadways with dedicated bicycle lanes on them. In addition to bicycle lanes, bicycle parking, showers, and locker facilities can help to encourage bicycle commuting.

Pedestrian activity was at a moderate level (4.2% of trips to work) but lower than many other communities. Again, census data do not include trips to school or other non-work activities.

Although the census data reflects the predominant use of the automobile, the growing population and employment opportunities, relatively short travel distances, level terrain, and clear weather conditions during the warmer seasons are favorable for other modes of transportation. The State-wide emphasis on providing pedestrian and bicycle facilities along with roadways encourages the use of these modes.

Table 4-5
Journey to Work Trips

	1990 Census	
Trip Type	**Trips**	**Percent**
Private Vehicle	2,966	87.2
Drove Alone	*2,574*	*75.7*
Carpooled	*392*	*11.5*
Public Transportation	6	0.2
Motorcycle	6	0.2
Bicycle	88	2.6
Walk	144	4.2
Other	28	0.8
Work at Home	162	4.8
Total	3,400	100.0

Source: *U.S. Bureau of Census*

CHAPTER 5: TRAVEL FORECASTS

Travel forecasts for Baker City were based on the land use and roadway designations contained in the comprehensive plan. Using the computer modeling program TMODEL2[3], future traffic (2015) was estimated for the PM peak hour of a typical weekday to reflect the critical time period of traffic operations.

Modeling is a five-step process: 1) study area definition; 2) land use projection; 3) trip generation; 4) trip distribution; and 5) trip assignment. The computer model is calibrated as closely as possible to an existing condition and then used to forecast future conditions. Calibration is achieved when simulated traffic volumes on the roadway system are generally within 10% of the actual measured traffic. This section defines these terms, describes the modeling process, and outlines the key assumptions for Baker City.

STUDY AREA DEFINITION

The first step in modeling requires defining the study area. For this definition, a roadway network and traffic analysis zone scheme which accurately represent the road system and density of land use activity in the study area were developed.

Roadway System Network

The limits of the roadway system network for the City were defined by the study area boundary (see Figure 1-1). Within this boundary, a network composed of arterial and collector roads was selected. This network includes all of the state highways, most of the county roads, and city streets that are vital to the circulation of traffic in Baker City.

Each roadway in the network has specific distance, speed, and capacity characteristics that are important factors in the traffic forecasting process. These factors help determine the route that a driver takes when traveling between two locations.

Traffic Analysis Zones

In addition to defining the study area network, a traffic analysis zone (TAZ) scheme was also developed. The TAZ scheme divides the study area into smaller analysis units that are used to tie land use activity and trip generation to physical locations within the network.

Within the planning area, 48 TAZ's were defined. Physical barriers, land use, and roadway characteristics were factors used to determine the TAZ structure. Whenever possible, the TAZ's were developed to have homogeneous land use characteristics because this scheme results in the most accurate traffic assignment.

[3] TMODEL2, Micro-computer software by Professional Solutions, Inc./Metro, 1992

Each TAZ is then connected to the network by one or more representative roadways. Since the traffic network does not include every road that exists within the study area, one connector may represent many local roads that are loading onto a collector or arterial street.

Outside of the study area, 9 zones load traffic from external locations, generally traffic from other cities. These zones produce three types of trips. The first type is through trips that begin in one external zone and end in another external zone but will pass through the city. For example, a vehicle traveling from Sumpter to Ontario might use Highway 7 and I-84 through Baker City.

The second type is a trip that begins in the city and ends at another location outside of the city. An example would be a Baker City resident who travels to La Grande to go shopping.

The last type is a trip that begins at another location outside of the city and ends in Baker City, such as someone who lives in Haines and works in Baker City. In the modeling process, the trips traveling to and from these external zones are associated with the actual roads leading into Baker City.

ESTIMATE AND PROJECT LAND USE

Once the traffic analysis zone scheme was defined, both existing (1995) and future (2015) land use forecasts were developed. The existing 1995 land use was used in the model calibration process. The 2015 projected land use was the basis for the future travel forecasts.

The land use characteristics that define growth are population and employment. For the travel forecasting model, population was represented by the number of single-family and multi-family dwelling units in each TAZ. Employment was broken down by type of land use (i.e. retail/commercial, office, industrial, etc.). Table 5-1 contains a summary of existing and future housing and employment by land use category. Appendix F contains the complete forecast by TAZ together with a detailed explanation of the land use forecasting process.

1995 Estimate

The 1995 population of the City and the surrounding area within the UGB is about 9,737. This population count was established using 1990 U.S. Census data and the estimated 1995 City population provided by the Center for Population Research at Portland State University.

As shown in Table 5-1, existing housing within the UGB totals about 4,328 dwelling units. Approximately 93 percent of these are single family homes (about 99 percent of them located within the city limits). The remaining 7 percent consist of multi-family houses, condominiums, and apartments (about 100 percent of them located within the city limits).

Table 5-1
Population and Employment Forecasts

Land Use	1995 Within City Limits	1995 Outside City Limits	1995 Total	2015 Within City Limits	2015 Outside City Limits	2015 Total
Single Family Dwelling Units	3,644	10	3,654	4,098	10	4,108
Multi-Family Dwelling Units	674	0	674	876	0	876
Retail/Commercial Employment	1,543	19	1,562	1,793	66	2,156
Office Employment	447	1	448	513	1	580
Industrial Employment	553	179	732	630	212	952
Hospital Employment	313	0	313	365	0	417
Government Office Employment	686	0	686	817	0	948
School Employment	415	0	415	488	0	561
Total Population	9,711	26	9,737	11,498	26	11,524
Total Dwelling Units	4,318	10	4,328	4,974	10	4,984
Total Employment	3,957	199	4,156	4,606	279	4,885

Year 2015 Population

Population within the UGB is estimated at about 11,525 for the year 2015 (over 98 percent within the current city limits). This population represents an increase of about 1,797 over the present population, equating to a nearly 20 percent overall increase in population, or an annual growth rate of 0.85 percent.

To estimate the 2015 population, historical growth rates were examined. Recently, Baker City has grown at an annual rate of 1.25 percent. From long-term data, it is expected that the average growth rate over the next 20 years will be slightly slower than the present rate.

The projected increase of about 1,797 new residents within the study area will create a demand for about 656 additional dwelling units by the year 2015 all within the city limits. Some TAZ's already contain housing and may be at build-out. These zones will only accommodate infill or replacement units. TAZ's containing larger areas of vacant land that are currently zoned for residential use and can accommodate more substantial growth.

1995 Estimate Employment

The 1995 estimated employment within the study area totals about 4,156 (98 percent within the city limits). The resulting population/employment ratio is approximately 2.3 to 1. Major employers were identified and located on the TAZ map through visual surveys and information from the Baker City Chamber of Commerce, Oregon Employment Department, Oregon Economic Development Department, and several assumptions. Those assumptions included City's own employment projections, existing development, the growing importance of tourism to Baker City's economy, and the employment relationship to population. More detailed information was obtained from conversations with businesses and government offices.

As indicated in Table 5-1, the employment base within the study area is dominated by the retail/commercial category. Approximately 1,562 of the 4,156 jobs (over 25 percent) in the study area are directly related to the retail/commercial jobs in Baker City. Industrial (732 jobs) and government/school (686 jobs) are a distant second and third to retail/commercial employment in the study area. Agricultural-related employment was not included in the employment estimates because most agriculture occurs outside of the Transportation System Plan planning area and does not significantly impact traffic flow through the city.

Year 2015 Employment

Over the next 20 years, Baker City employment is expected to increase 17.5 percent (729 new jobs). The population/employment ratio of the study area is expected to be about the same as in 1995, 2.3 to 1. The projections assume that government, medical, and school employment will increase at approximately the same rate as population. Employment in the downtown core areas was projected to increase by a maximum of 10 percent, and the overall office employment growth is approximately 17.5 percent.

TRIP GENERATION

Vehicle trip generation, the next step in the modeling process, is a method of estimating the number and type of trips a specific land use will produce or attract based on historic data and surveys of similar developments. The trip generation estimates were made for each TAZ in the planning area on the basis of the type and quantity of households and employees.

Trip generation rates applied to these land uses were derived from the Institute of Transportation Engineers report, *Trip Generation* (*Fifth Edition, 1991*) and a transportation behavior survey conducted in January of 1995 (Appendix D). These rates were modified to reflect generalized land use categories for planning purposes on the basis of experience in other similar size cities in Oregon and through the travel model calibration process. These trip rates, summarized in Table 5-2, also reflect the existing level of transit service and use of alternative modes. An increase in transit ridership or use of other modes was evaluated with the alternatives.

Each trip is defined by the land use from which it originates, the land use for which it is destined, and the purpose of the trip. Trip generation rates were refined for each origin and destination for four purposes:

- *Home-based work*–Trips between home and a place of employment.
- *Home-based shopping*–Trips between home and a retail center for the purpose of shopping.
- *Home-based other*–Trips between home and another land use for a purpose other than employment or shopping (e.g. school trips).
- *Non-home based*–Trips between two non-residential land uses.

The amount of traffic generated for each TAZ was estimated for the PM peak hour by multiplying the number of households or employees by the appropriate origin and destination trip generation rate by trip purpose.

Trip origins and destinations were also calculated for the 9 external roadways leading into Baker City. These trip calculations are based on historic growth along the roadways and potential increases in population and/or employment outside of the study area.

Table 5-2
PM Peak Hour Vehicle Trip Generation Rates for Baker City Traffic Forecasting Model

Land Use		Home-Based Work	Home-Based Shopping	Home-Based Other	Non-Home-Based	Total Rates
TRIP PRODUCTIONS						
Single Family	Origin	0.01	0.10	0.16	0.07	0.34
	Destination	0.36	0.19	0.08	0.08	0.71
Multi-Family	Origin	0.00	0.07	0.11	0.05	0.23
	Destination	0.25	0.13	0.06	0.06	0.50
TRIP ATTRACTIONS						
Retail/Commercial	Origin	0.10	0.56	0.00	0.35	1.01
	Destination	0.00	0.35	0.18	0.35	0.88
Industrial	Origin	0.40	0.00	0.00	0.05	0.45
	Destination	0.05	0.00	0.00	0.05	0.10
Hospital	Origin	0.10	0.00	0.09	0.02	0.21
	Destination	0.00	0.00	0.03	0.06	0.09
Government	Origin	0.68	0.00	0.00	0.16	0.84
	Destination	0.00	0.00	0.00	0.16	0.16
Office	Origin	0.49	0.00	0.00	0.09	0.58
	Destination	0.00	0.00	0.00	0.12	0.12
School	Origin	0.68	0.00	0.21	0.16	1.05
	Destination	0.00	0.00	0.10	0.35	0.45

TRIP DISTRIBUTION

Vehicle trip distribution, the fourth step in the modeling process, is a method of determining the origin and destination of trips within the study area. For each TAZ, trip origins were distributed to all of the trip destinations within the planning area and to the roads leading out of the study area. Trip origins were also calculated for the roads leading into the area.

A standard gravity model was used for trip distribution. The basic premise of the gravity model is that the number of trips between two areas is directly related to the size of the attractions or destinations in each zone and inversely related to the travel time between zones. For example, if two destination zones of equal size were located 10 and 15 minutes from the origin zone, more of the trips from the origin zone would be distributed to the closer destination zone. Likewise, if two destination zones of different sizes were located equal driving times from the origin zone, more trips would be distributed to the larger destination zone. This procedure was followed for trips originating in all 35 internal zones and the roads leading into the study area.

VEHICLE TRIP ASSIGNMENT

Trip assignment, the final step in the modeling process, is a method of assigning trips distributed between origin zones and destination zones to specific paths on the street system. The forecasting model used a capacity-constrained assignment methodology that assigns traffic in percentage increments to the street system based on travel time. For the first increment, each trip is assigned to the shortest route between its origin and destination based on travel time. The travel time on each route is then adjusted to account for congestion and delay which may result from the first incremental assignment. As the fastest route becomes congested, its travel time increases, possibly making a previously slower route the faster of the two. For the second increment of traffic, each trip follows the same guidelines and is assigned to the quickest route, and then travel times are readjusted to account for the new level of congestion. This process continues until all the increments have been assigned. Using this procedure, the traffic between a single origin/destination pair could be assigned to several routes depending on the congestion of each route, thereby simulating "real world" motorists' choices on a travel route.

MODEL CALIBRATION

Prior to assigning 2015 traffic, this entire process of estimating trip generation, distribution, and assignment was completed for 1995 conditions and compared with actual measurements on the roadway system. The theory behind calibration reasons that if the modeling process forecasts current conditions reasonably well, the same process should then provide a reasonably good estimate of future conditions.

To calibrate the model, the trip generation, distribution, and assignment process was repeatedly modified until the assigned volumes were within approximately 10% of the actual counts.

Data on through traffic were also used to calibrate the model. Through traffic was measured in March of 1995 by matching the license numbers of all vehicles entering and leaving the City.

FUTURE ASSIGNMENTS

For the future traffic analysis, 2015 traffic was first assigned to the existing major street system to determine which portions of the system would be deficient within the next twenty years. The model was then used to evaluate the affects of alternative roadway configurations on traffic assignment.

CHAPTER 6: IMPROVEMENT OPTIONS ANALYSIS

A "No Build" scenario, transportation demand management measures, and potential transportation improvements were developed and analyzed as part of the transportation system analysis. These potential improvements were developed with the help of the TAC, and attempt to address the concerns specified in the goals and objectives (Chapter 2). The 2015 travel patterns, roadway requirements, and costs were analyzed. Based on that analysis, a list of improvements to be incorporated is recommended.

Each of the transportation system improvements options was developed to address specific deficiencies or access concerns. The following list includes all of the potential transportation system improvements considered. Improvement Options 4 through 9 are illustrated in Figure 6-1.

1. Revise zoning code to allow and encourage mixed-use development and redevelopment.

2. Implement transportation demand management strategies.

3. Develop a new striping plan for Campbell Street and recommend improvements to increase pedestrian safety crossing the roadway.

4. Improve Indiana Avenue to address the safety hazard of very steep grades.

A. Use fill west of 11th Street to reduce the grade.

B. Create a new connection between Indiana Avenue and Hillcrest Drive and close Indiana Avenue to automobiles where grade is steepest.

5. Connect Birch Street between Idlewood Drive and H Street and between D Street and Campbell Street.

6. Extend Main Street northwards to create a "parkway" connection to Highway 86.

A. Connect near Interchange 302 with I-84.

B. Connect with Hughes Lane

7. Connect D Street between Main Street and Walnut Street.

8. Create a continuous roadway on H Street between Best Frontage Road and 10th Street with the following improvements

Connect H Street across I-84 between Best Frontage Road and the stub west of the interstate.

Connect H Street over the Powder River between the stub east of the river and the stub near 8th Drive.

9. Create a southeast connector between Highway 7 and Highway 30 to provide a shorter route to Interchange 306 on I-84 that would reduce the truck traffic through downtown Baker City.

As discussed in the remaining sections of this chapter, not all of these considered improvements were recommended. These recommendations were based on costs and benefits relative to traffic operations, the transportation system, and the community livability.

EVALUATION CRITERIA

The evaluation of the potential transportation improvements was based on an analysis of traffic projections, a qualitative review of safety, environmental, socioeconomic, and land use impacts, as well as estimated cost.

The traffic analysis considered several factors. The operations of critical signalized and unsignalized intersections were evaluated with the improvements for each potential transportation system improvement. The potential improvements were analyzed to determine if they could reduce congestion and delay, as well as vehicle miles traveled, because of the beneficial effects of that reduction.

In addition to the quantitative traffic analysis, three factors were evaluated qualitatively: 1) safety; 2) environmental factors, such as air quality, noise, and water quality; and 3) socioeconomic and land use impacts, such as right-of-way requirements and impacts on adjacent lands.

The final factor in the evaluation of the potential transportation improvements was cost. Costs were estimated in 1995 dollars based on preliminary alignments for each potential transportation system improvement.

"NO BUILD" SCENARIO

The "No Build" scenario establishes the baseline for all other analysis. This scenario assumes that no major changes would be made to the existing transportation system for the next 20 years. However, traffic volumes would increase in Baker City as population and employment increase by about 20 percent by the year 2015. By comparing the future traffic demand with the unchanged transportation system, we can determine where future problems are likely to occur.

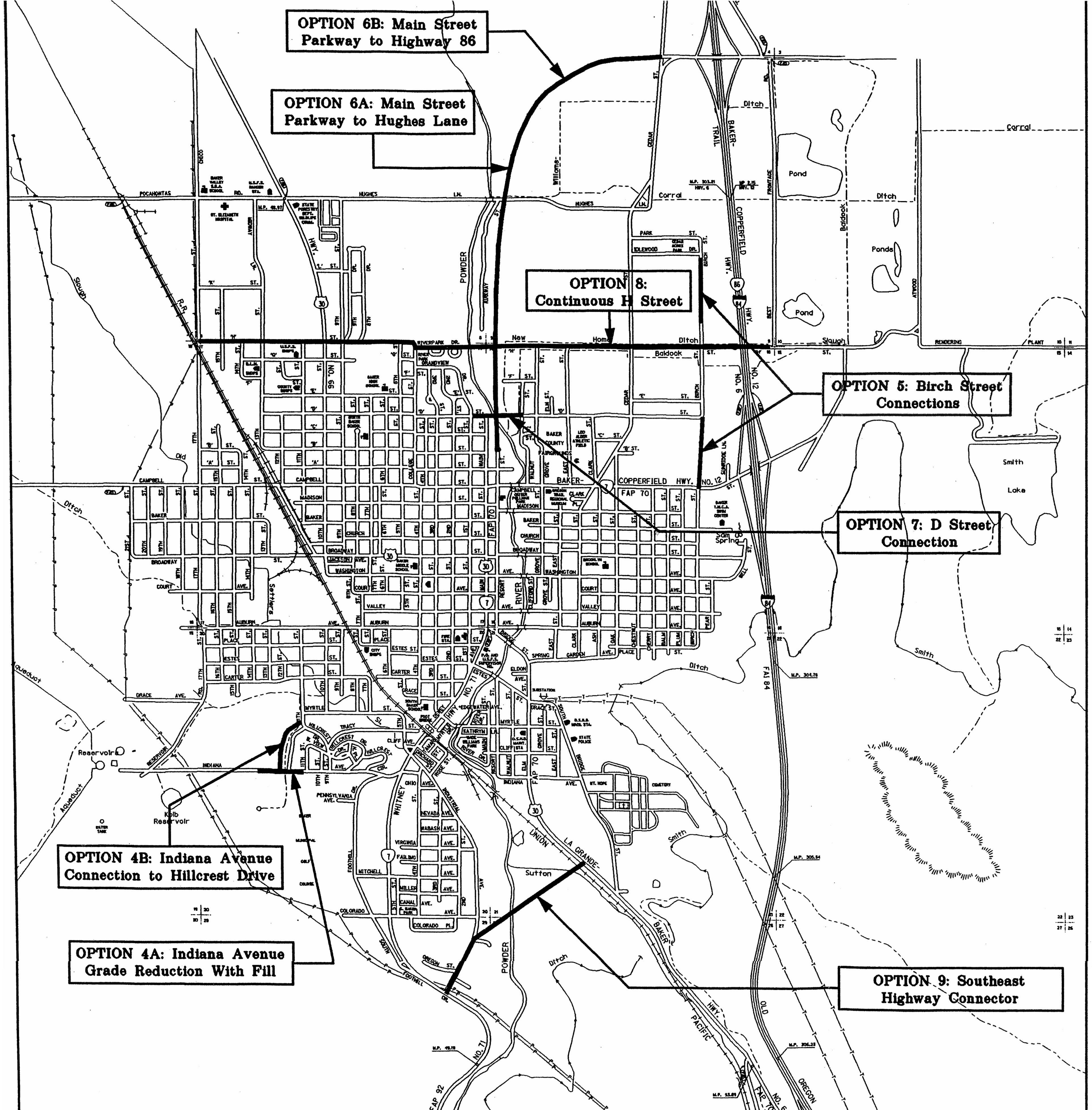
Chapter 5 describes in detail how the travel forecasting model was developed and the population and employment data were used to project 2015 PM peak hour traffic volumes. The results of the "No Build" model run are shown in Figure 6-2.

2015 Traffic Projections

Motor vehicle traffic volumes throughout the Baker City area are projected to increase by about 20% by the year 2015, if no changes occur to modify the current trend of increasing motor vehicle use.

2015 Average Trip Lengths

From the travel demand forecasting model for 1995 and 2015, average trip lengths can be estimated (See Table 6-1.) The percentage of through trips (trips with one end in Baker City) and trips entirely within Baker City is similar between 1995 and 2015. However, the distribution of trip distances will change somewhat over the next twenty years.



DAVID EVANS AND ASSOCIATES, INC.

NOT TO SCALE

LEGEND

STREET IMPROVEMENT PROJECT

FIGURE 6-1

BAKER CITY STREET IMPROVEMENT OPTIONS

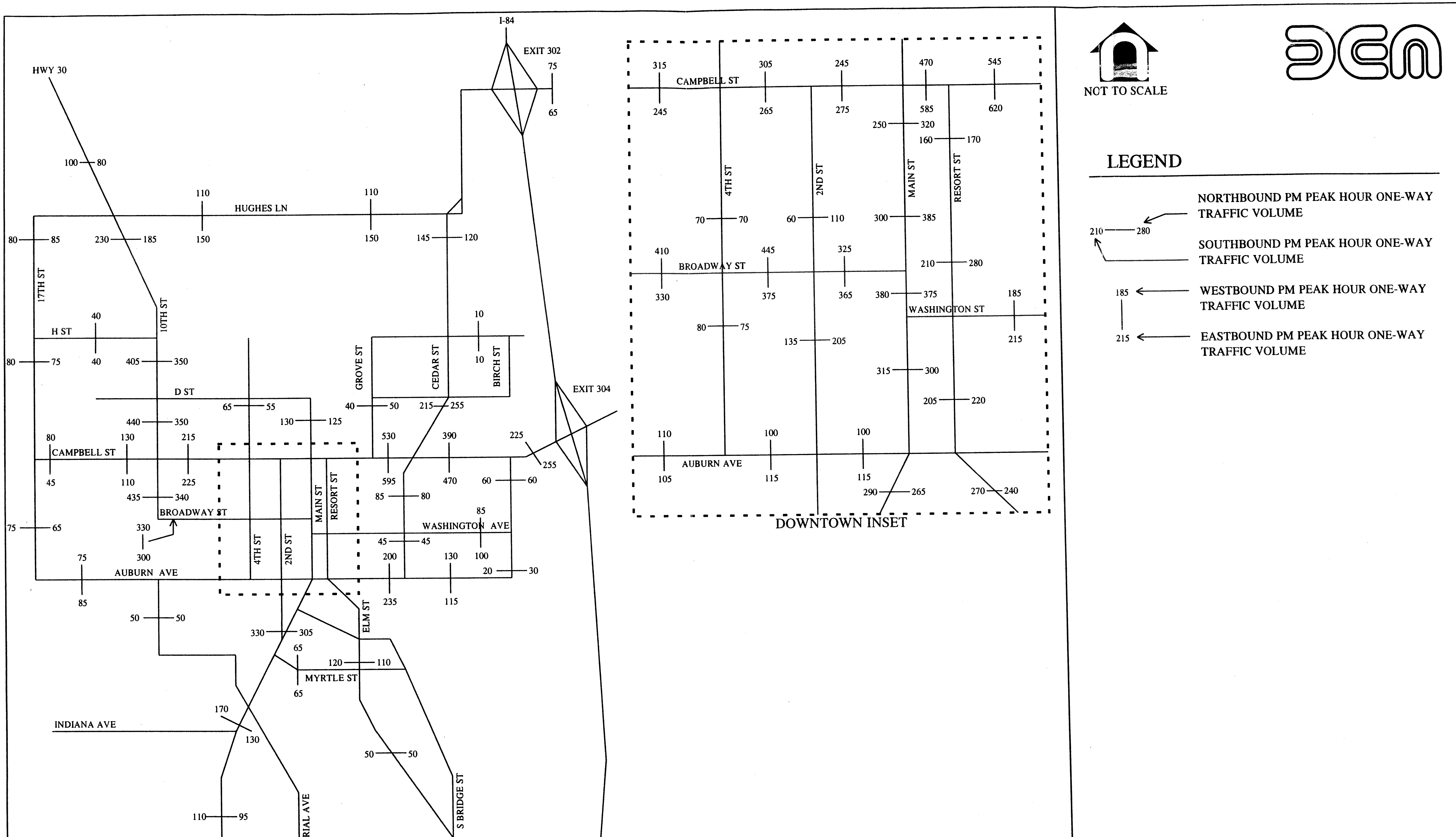


FIGURE 6-2
2015 NO BUILD WEEKDAY
PM PEAK HOUR TRAFFIC VOLUMES

Table 6-1
Future Average Trip Lengths

Trip Type/Length	1995 Number of Trips	1995 Percentage of Total	1995 Percentage of Total within Baker City	2015 Number of Trips	2015 Percentage of Total	2015 Percentage of Total within Baker City
All Within the Study Area						
Up to 1/4 mile	632	11.6%	14.8%	688	9.7%	13.8%
1/4 mile to 1/2 mile	1,362	25.0%	32.0%	1,511	21.4%	30.3%
1/2 mile to 1 mile	1,988	36.5%	46.6%	2,380	33.6%	47.7%
1 mile to 2 miles	283	5.2%	6.6%	407	5.7%	8.2%
Subtotal	4,265	78.3%	100.0%	4,986	70.4%	100.0%
One End of Trip within the Study Area	730	13.4%		898	12.7%	
Through Trips	452	8.3%		1,196	16.9%	
Total Trips	5,447	100.0%		7,080	100.0%	

Note: Through trips include trips on I-84 which pass through the study area without stopping.

In 1995, all of the motor vehicle trips that are entirely within the planning area were 2 miles or less in length. Almost 47% of the trips were under ½ mile in length.

By 2015, all of the trips that are entirely within the study area would still be under 2 miles in length, but the distribution would be slightly higher for longer trips. Over 44% of the trips would still be under ½ mile in length but the distribution for trips between ½ and 1 mile would increase by 1% and trips between 1 and 2 miles would increase by 2%.

These increases in average trip length translate to a greater number of vehicle miles traveled than at present. Although the number of trips generated in the city is expected to increase by about 18 percent over the next 20 years, the higher average trip length would result in total vehicle miles increasing by about 22 percent during the same time period.

2015 Operations Analysis

The increases in motor vehicle volumes under the assumptions of the forecasting model would result in the intersection operations summarized in Table 6-2.

Table 6-2
Summary of Operations at Critical Intersections: Existing and "No Build"

Location	Movement	1995 Average	1995 Summer	2015 Average	2015 Summer
Campbell St & Oak St	Eastbound; Left	A	A	A	A
	Westbound; Left	A	A	A	A
	Northbound; Left, Through, Right	C	D	C	D
	Southbound; Left, Through, Right	C	D	C	D
Campbell St & Cedar St	Eastbound; Left	A	A	A	A
	Westbound; Left	A	A	A	A
	Northbound; Left, Through, Right	B	C	C	D
	Southbound; Left, Through, Right	A	A	A	B
Campbell St & Grove St	Eastbound; Left	A	A	A	A
	Westbound; Left	A	A	A	A
	Northbound; Left, Through, Right	B	C	C	D
	Southbound; Left, Through, Right	A	B	C	D
Campbell St & Resort St	Eastbound; Left	A	A	A	A
	Westbound; Left	A	A	A	A
	Northbound; Left, Through	D	E	E	E
	Northbound; Right	A	A	A	A
	Southbound; Left, Through, Right	D	E	E	E
Campbell St & Main St	All	B (42%)	B (52%)	B (53%)	B (67%)
Campbell St & 4th/College St	Eastbound; Left, Through, Right	B	B	B	B
	Westbound; Left, Through, Right	B	B	B	B
	Northbound; Left, Through, Right	B	B	B	B
	Southbound; Left, Through, Right	B	B	B	B
Campbell St & 10th St	All	B (28%)	B (35%)	B (34%)	B (42%)
Campbell St & 17th St	Eastbound; Left	A	A	A	A
	Westbound; Left	A	A	A	A
	Northbound; Left, Through, Right	A	A	A	A
	Southbound; Left, Through, Right	A	A	A	A
Broadway St & Main St	All	B (35%)	B (43%)	B (40%)	B (49%)
Broadway St & 2nd St	All	B (27%)	B (32%)	B (30%)	B (36%)
Broadway St & 4th St	All	A (17%)	A (21%)	A (21%)	A (25%)
Washington St & Resort St	Eastbound; Left, Through, Right	A	B	B	C
	Westbound; Left, Through, Right	A	B	B	C
	Northbound; Left	A	A	A	A
	Southbound; Left	A	A	A	A
Washington St & Main St	All	B (23%)	B (27%)	B (26%)	B (31%)
Washington St & 4th St	Eastbound; Left	A	A	A	A
	Westbound; Left	A	A	A	A
	Northbound; Left, Through, Right	A	A	A	A
	Southbound; Left, Through, Right	A	A	A	A
Auburn Ave & Main St	All	B (34%)	B (43%)	B (38%)	B (47%)
Auburn Ave & 4th St	Eastbound; Left	A	A	A	A
	Westbound; Left	A	A	A	A
	Northbound; Left, Through, Right	A	A	A	A
	Southbound; Left, Through, Right	A	A	A	A

Notes: The Level of Service is shown for all movements of the unsignalized intersections. At signalized intersections the overall Level of Service is shown for the intersection together with the overall volume-to-capacity ratio.

In general, the intersections are expected to operate well. Traffic on the arterial streets would continue to flow smoothly and operate at LOS B or better. All of the side street approaches to Campbell Street would experience increased delays. The worst location would be Resort Street. Future analysis indicates that the Resort Street approaches southbound; all movements and northbound; left and through movements at this intersection would operate at LOS E all year round. The Oak, Cedar, and Grove Street approaches to Campbell Street would all experience an increase in delay. Making a left-turn movement from these side streets onto Campbell Street will be even more difficult with higher east-west volumes. The delayed left-turning vehicles will hold up the other vehicles that may want to make a right turn onto Campbell Street causing longer delays for everyone.

Impacts

The "No Build" scenario would not have any major impacts as long as growth continues at the projected rate. However, with no planning or improvements now, capacity and livability issues will eventually arise.

Cost

No direct costs are associated with the "No Build" scenario.

Recommendation

Because the conditions in "No Build" scenario would not be significantly worse than conditions today, the primary concern for the future transportation system would be maintaining street connectivity and addressing some existing safety issues, especially for pedestrians and bicyclists.

EVALUATION OF POTENTIAL TRANSPORTATION IMPROVEMENTS

Option 1. Revise Zoning and Development Codes

Overview: This improvement would amend Baker City' zoning and development codes to permit mixed use developments and increases in density in certain areas. Specific amendments include allowing neighborhood commercial uses within residential zones and allowing residential uses within commercial zones. (Suggested code amendments have been provided to Baker City under separate cover.)

Traffic Projections: Such code amendments can encourage residents to walk and bicycle throughout the community by providing shorter travel distances between land uses. A shift in mode would reduce reliance on the automobile, a goal of the State Transportation Planning Rule.

Operations Analysis: These changes combined with the construction of new sidewalks and bicycle lanes can (Option 2) help reduce traffic congestion and improve the air quality and noise levels in Baker City. A detailed analysis is presented under Option 2.

Impacts: Maintaining the livability of the community encourages new residents and businesses to locate in Baker City, helping to keep the area economically viable.

Cost: No direct costs are associated with making the zoning code amendments.

Recommendation: Because this transportation improvement would contribute to less need for new road construction and would enhance the quality of life in the Baker City area, it is recommended.

Option 2. Implement Transportation Demand Management (TDM) Strategies

Overview: This improvement would change the demand on the transportation system by providing facilities for other modes of transportation, implementing carpooling programs, altering shift schedules, and applying other transportation measures within the community.

The construction and maintenance of walkways and bikeways is needed within the Baker City area to improve safety for pedestrians and bicyclists and encourage more residents to limit their use of motorized vehicles. The addition of new sidewalks and bicycle lanes should be considered with all new street improvement projects. Local businesses, particularly those within the Baker City Industrial Park should be encouraged to institute carpooling or vanpooling programs for their employees. Local businesses should also be encouraged to stagger shifts so that travel to and from work is spread over a longer period.

Traffic Projections: A sensitivity exercise was performed to test the effects of TDM measures (Option 2) combined with revising the zoning and development codes (Option 1) on traffic projections. The average trip lengths from the "No Build" scenario were used as the basis for this exercise. Both Options 1 and 2 would result in shifts in modes away from single occupancy vehicles to carpools, vanpools, other non-auto modes, and telecommuting. Therefore, the sensitivity analysis assumed that vehicle trips would be reduced due to increased usage of these other travel options. The results of this sensitivity test are summarized in Table 6-3.

Table 6-3
Effect of Transportation Demand Management Measures
And Revised Zoning and Development Codes

Trip Type/Length	"No Build"	A	B	C
Within the Study Area				
Up to 1/4 mile	688	654	619	619
1/4 mile to 1/2 mile	1,511	1,435	1,360	1,360
1/2 mile to 1 mile	2,380	2,261	2,142	2,142
1 miles to 2 miles	407	387	366	366
Subtotal	4,986	4,737	4,487	4,487
One End of Trip within the Study Area	898	898	898	853
Through Trips	1,196	1,196	1,196	1,196
Total Trips	7,080	6,831	6,581	6,537
Percent Reduction	NA	3.5%	7.0%	7.7%

"No Build": No Trip Reductions
A: "No Build" with a 5% reduction in trips under 2 miles.
B: "No Build" with a 10% reduction in trips under 2 miles.
C: "No Build" with a 10% reduction in trips under 2 miles and a 5% reduction in trips with only one end within the study area.

Scenarios A through C looked at different reductions in trip length due to the implementation of TDM measures. The reduction in trips of less than 2 miles was assumed to be between 5 and 10%. These reductions would occur predominantly because of modal shifts from motor vehicles to walking or bicycling and an increase in telecommuting. Trips which travel in or out of the study area were tested with reductions between 0 and 5%. The reductions at this distance may also be due to carpooling measures as well as modal shifts and telecommuting.

Operations Analysis: Overall, the options resulted in total trip reductions of less than 10% in all cases. While these reductions indicate that some beneficial mode shifting would occur, street system capacity for automobiles and trucks is generally not an issue in Baker City.

Impacts: The predicted mode shifts and demand management measures would contribute to improved traffic flow and less congestion. These conditions mean air quality and noise levels would be better than the "No Build" Condition. Fewer vehicle miles traveled would also result in reduced energy consumption. In addition, providing adequate facilities for pedestrians and bicyclists increases the livability of a city, and improves traffic safety.

Cost: Twenty-three pedestrian improvements have been identified at an estimated cost of $3.9 million. (Detailed recommendations are provided in Chapter 7.) Fifteen bicycle improvements have been identified at an estimated cost of $552,000. (Detailed recommendations are provided in Chapter 7.) These cost estimates are for stand-alone improvements; the cost can be reduced when they are included as needed in roadway improvement projects throughout the Baker City urban area.

Recommendation: Because this option would provide needed facilities for pedestrians and bicyclists, increase the safety of the roadway system, and enhance the quality of life in the Baker City area, these transportation improvements are recommended.

Option 3. Develop an Improvement Plan for Campbell Street

Two major concerns with Campbell Street between I-84 and Main Street came up repeatedly during the development of the TSP: 1) it is difficult to turn onto Campbell Street from side streets or driveways and 2) it is difficult for pedestrians to cross Campbell Street. To address these concerns two other lane striping plans were evaluated and some pedestrian crossing improvements were considered.

Lane Striping Improvements

Campbell Street is currently striped with 4 lanes of traffic: 2 lanes eastbound and 2 lanes westbound as shown in Figure 6-3, Section A. For each direction of traffic, all vehicles must make their movements from one of those two lanes. Right turns are made from the right lane (the lane closest to the curb). Through movements are made from either of the two moving lanes. Left turns are made from the left lane (the lane closest to the center of the roadway). In general, this striping plan works well for the traffic on Campbell Street which has plenty of capacity for all movements.

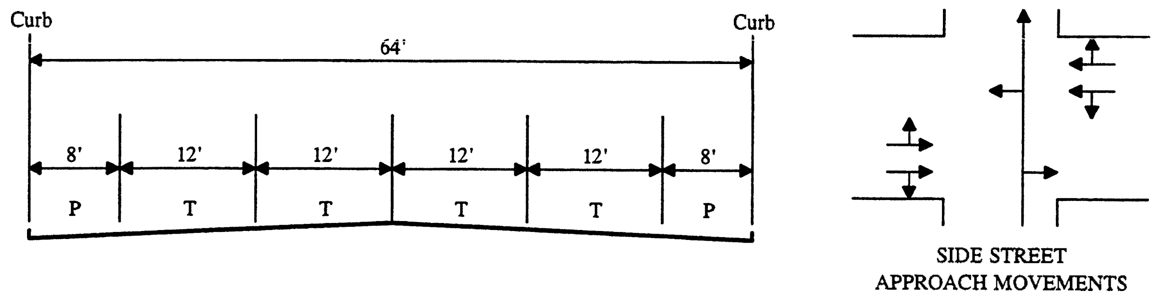
The side street approaches to Campbell Street are mostly striped with 2 lanes of traffic: 1 lane northbound and 1 lane southbound. For each direction of traffic, all vehicles must make their movements from that one lane. When a vehicle at a side street approach wants to make a right turn, it looks for a gap in the traffic in the right

LEGEND

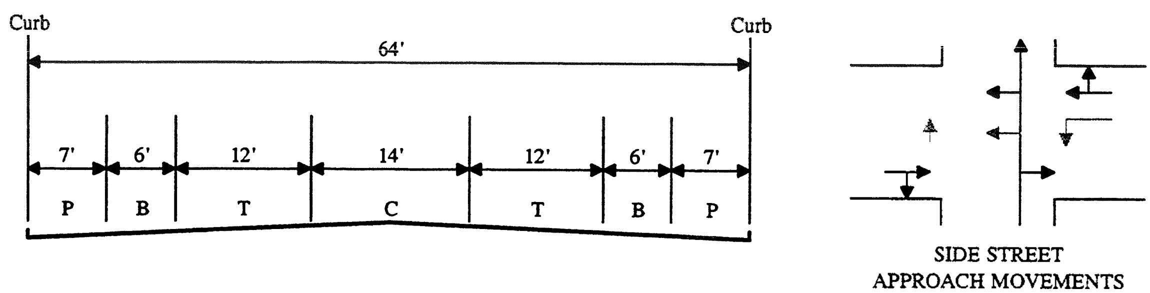
B = BIKE LANE
C = CENTER REFUGE LANE
P = PARKING
T = TRAVEL LANE

DAVID EVANS & ASSOCIATES, INC.

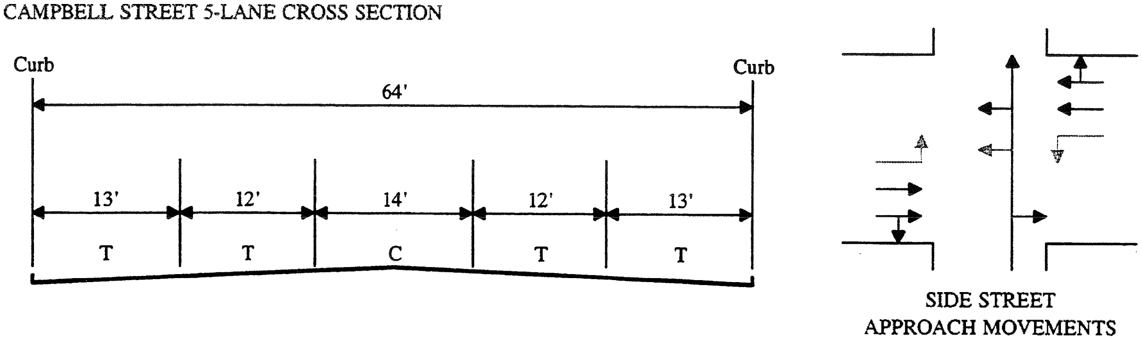
A. CURRENT CAMPBELL STREET 4-LANE CROSS SECTION



B. CAMPBELL STREET 3-LANE CROSS SECTION WITH BIKE LANES



C. CAMPBELL STREET 5-LANE CROSS SECTION



Note: The light colored arrows shown in the side street approach diagrams indicate movements involving the center refuge lane. The dark colored arrows indicate movements involving main travel lanes.

FIGURE 6-3
CAMPBELL STREET
STRIPING OPTIONS

lane on Campbell Street and then makes its move, mixing with the traffic in that lane, as shown in the diagram in Figure 6-3, Section A. If a vehicle wants to cross Campbell Street, it must find a gap in both directions of Campbell Street traffic large enough to cross all four lanes. A left-turning vehicle must wait for a gap in traffic so that it can cross two lanes of traffic flow in one direction and enter the traffic stream in the other direction. With the present volumes on Campbell Street, the number of gaps in the traffic flow are adequate to meet the side street demand, but some of the approaches are beginning to experience longer delays, especially at Resort Street.

Two lane striping improvement options were examined for this analysis:

Three-Lane Striping Plan with Bicycle Lanes and On-Street Parking

Overview: The first option would stripe Campbell Street with 3 traffic lanes: 1 moving lane in each direction and a center refuge lane. On-street parking would be retained and there would be enough additional roadway to provide for a bicycle lane on each side of the street. Striping within the 64-foot wide pavement would provide a 7-foot parking lane, 6-foot bike lane, 12-foot travel lane, 14-foot center refuge lane, 12-foot travel lane, 6-foot bike lane, and 7-foot parking lane. (See Figure 6-3, Section B.)

Traffic Projections: Existing volumes and future traffic projections would not change with the striping plan for Campbell Street.

Operations Analysis: A summary of the operations at four intersections along Campbell Street is presented in Table 6-4 for current conditions and Table 6-5 for future conditions. The level of service and remaining capacity is shown for each movement.

Although a 3-lane roadway section has fewer moving lanes than a 4-lane section, the capacity reduction may not be as great as one might expect. When left turns are made, the vehicle stopped to make its turn blocks the left lane, causing through-moving vehicles behind it to stop also or change lanes to pass. The more vehicles make left turns, the more through-moving vehicles shift to the right lane. When left-turning volumes are very high, almost all of the through traffic uses the right lane, and the left lane becomes an exclusive left-turn lane by default.

With a 3-lane striping pattern, operations for all Campbell Street movements would remain at LOS A for both current and future conditions. However, the capacity for through traffic would be reduced by about 40 percent while the capacity for left-turn movements would increase by about 15 to 20 percent.

The capacity for side street approaches to Campbell Street would generally increase with a 3-lane striping pattern versus the current 4-lane pattern, resulting in shorter delays for vehicles waiting at these approaches. The increase in capacity occurs because the gaps in traffic needed for side street vehicles to either cross or make a left turn onto Campbell Street has been reduced because the number of lanes of traffic that need to be crossed has been reduced.

Impacts: There are more positive than negative impacts with the revised striping plan. The 3-lane striping pattern would reduce capacity on Campbell Street but with the current and projected volumes, traffic would still flow smoothly. In general, it would increase capacity on the side streets because they would have fewer lanes to cross for many of their movements.

A center refuge lane can also improve the safety of Campbell Street. By providing a refuge for left-turning vehicles, it can reduce the number of rear end accidents which occur when a vehicle stops in the left lane to make a turn and is hit by the vehicle behind it.

A center refuge lane can also reduce the number of accidents because it can reduce the number of unnecessary lane changes. When a vehicle stops to make a left turn, it blocks the use of that lane for other vehicles. As a result, drivers behind the stopped vehicle change to the right lane to go around it. This lane change cause several unsafe conditions. Other vehicles on either the main roadway or a side street, pedestrians trying to cross the road, and drivers getting out of parked cars may not be expecting the lane change which could result in an accident.

The 3-lane striping plan would also allow enough space on the roadway surface to maintain on-street parking and still provide 6-foot bike lanes on either side of Campbell Street. The addition of the bike lane would have several safety benefits. Bicyclists would have a safe location to ride on the roadway. Adequate space for drivers in parked cars to open their doors without interfering with bicyclists would be provided reducing the likelihood of collisions.

Cost: The cost for restriping Campbell Street is relatively low and is already done on a regular basis because the paint normally wears off the roadway over time. There would be some additional cost for adding the bike lane striping and signing estimated at $11,000.

DCM INC.

Table 6-4
Summary of Operations at Campbell Street Intersections with Striping Options
Current Conditions (1995)

		Current Striping		3-Lane Striping		5-Lane Striping	
Location	Movement	LOS	Remaining Capacity	LOS	Remaining Capacity	LOS	Remaining Capacity
Campbell St & Oak St	Eastbound; Left	NA	NA	A	805	A	705
	Eastbound; Through, Right	NA	NA	A	1159	A	2829
	Eastbound; Left, Through, Right	A	2798	NA	NA	NA	NA
	Westbound; Left	NA	NA	A	717	A	630
	Westbound; Through, Right	NA	NA	A	1272	A	2945
	Westbound; Left, Through, Right	A	2911	NA	NA	NA	NA
	Northbound; Left, Through, Right	D	193	C	235	D	193
	Southbound; Left, Through, Right	D	199	C	243	D	199
Campbell St & Cedar St	Eastbound; Left	NA	NA	A	673	A	577
	Eastbound; Through, Right	NA	NA	A	1152	A	2827
	Eastbound; Left, Through, Right	A	2321	NA	NA	NA	NA
	Westbound; Left	NA	NA	A	708	A	623
	Westbound; Through, Right	NA	NA	A	1234	A	2915
	Westbound; Left, Through, Right	A	2874	NA	NA	NA	NA
	Northbound; Left, Through, Right	C	263	C	295	C	263
	Southbound; Left, Through, Right	A	503	A	449	A	503
Campbell St & Grove St	Eastbound; Left	NA	NA	A	636	A	554
	Eastbound; Through, Right	NA	NA	A	1043	A	2715
	Eastbound; Left, Through, Right	A	2456	NA	NA	NA	NA
	Westbound; Left	NA	NA	A	623	A	543
	Westbound; Through, Right	NA	NA	A	1103	A	2778
	Westbound; Left, Through, Right	A	2699	NA	NA	NA	NA
	Northbound; Left, Through, Right	C	227	C	245	C	227
	Southbound; Left, Through, Right	B	334	B	336	B	344
Campbell St & Resort St	Eastbound; Left	NA	NA	A	765	A	669
	Eastbound; Through, Right	NA	NA	A	1092	A	2790
	Eastbound; Left, Through, Right	A	2726	NA	NA	NA	NA
	Westbound; Left	NA	NA	A	534	A	453
	Westbound; Left, Through, Right	NA	NA	A	1277	A	3004
	Westbound; Through, Right	A	2165	NA	NA	NA	NA
	Northbound; Left, Through	E	64	D	102	E	64
	Northbound; Right	A	688	A	479	A	688
	Southbound; Left, Through, Right	E	95	D	114	E	95

Table 6-5
Summary of Operations at Campbell Street Intersections with Striping Options
Future Conditions (2015)

		Current Striping		3-Lane Striping		5-Lane Striping	
Location	Movement	LOS	Remaining Capacity	LOS	Remaining Capacity	LOS	Remaining Capacity
Campbell St & Oak St	Eastbound; Left	NA	NA	A	774	A	677
	Eastbound; Through, Right	NA	NA	A	995	A	2781
	Eastbound; Left, Through, Right	A	2747	NA	NA	NA	NA
	Westbound; Left	NA	NA	A	679	A	596
	Westbound; Through, Right	NA	NA	A	1158	A	2906
	Westbound; Left, Through, Right	A	2815	NA	NA	NA	NA
	Northbound; Left, Through, Right	D	151	D	191	D	151
	Southbound; Left, Through, Right	D	151	D	190	D	151
Campbell St & Cedar St	Eastbound; Left	NA	NA	A	561	A	473
	Eastbound; Through, Right	NA	NA	A	1094	A	2766
	Eastbound; Left, Through, Right	A	2025	NA	NA	NA	NA
	Westbound; Left	NA	NA	A	666	A	584
	Westbound; Through, Right	NA	NA	A	1178	A	2855
	Westbound; Left, Through, Right	A	2786	NA	NA	NA	NA
	Northbound; Left, Through, Right	D	168	C	200	D	168
	Southbound; Left, Through, Right	B	356	B	316	B	356
Campbell St & Grove St	Eastbound; Left	NA	NA	A	538	A	458
	Eastbound; Through, Right	NA	NA	A	943	A	2608
	Eastbound; Left, Through, Right	A	2185	NA	NA	NA	NA
	Westbound; Left	NA	NA	A	562	A	482
	Westbound; Through, Right	NA	NA	A	972	A	2641
	Westbound; Left, Through, Right	A	2513	NA	NA	NA	NA
	Northbound; Left, Through, Right	D	127	D	152	D	127
	Southbound; Left, Through, Right	D	175	D	193	D	175
Campbell St & Resort St	Eastbound; Left	NA	NA	A	671	A	588
	Eastbound; Through, Right	NA	NA	A	1115	A	2687
	Eastbound; Left, Through, Right	A	2593	NA	NA	NA	NA
	Westbound; Left	NA	NA	A	456	A	376
	Westbound; Through, Right	NA	NA	A	1235	A	2880
	Westbound; Left, Through, Right	A	1921	NA	NA	NA	NA
	Northbound; Left, Through	E	15	E	40	E	15
	Northbound; Right	A	625	B	397	A	625
	Southbound; Left, Through, Right	E	57	E	68	E	57

Five-Lane Striping Plan

Overview: The second option would stripe Campbell Street with 5 traffic lanes: 2 moving lanes in each direction and a center refuge lane. On-street parking would be eliminated to allow for the additional travel lanes. There would not be any additional roadway available to provide for a bicycle lane on either side of the street. Striping within the 64-foot wide pavement would provide a 13-foot travel lane, 12-foot travel lane, 14-foot center refuge lane, 12-foot travel lane, and 13-foot travel lane. (See Figure 6-3, Section C.)

Traffic Projections: Existing volumes and future traffic projections would not change with the striping plan for Campbell Street.

Operations Analysis: A summary of the operations at four intersections along Campbell Street is presented in Table 6-4 for current conditions and Table 6-5 for future conditions. The level of service and remaining capacity is shown for each movement.

The 5-lane roadway section would have more capacity than the current 4-lane section because of the addition of the center refuge lane. Vehicles turning left would no longer stop in a lane shared with through vehicles.

The capacity for side street approaches to Campbell Street would be about the same as it currently is. It may be slightly easier to make a left turn from the side street because the turning vehicle could wait in the center refuge lane before entering the stream of traffic on Campbell Street. Through movements would be slightly more difficult since the distance across moving lanes of traffic would be greater. Although the pavement width would not change, the width of traffic lanes would increase from 48 feet to 64 feet.

Impacts: The 5-lane striping plan has both positive and negative impacts. The 5-lane striping pattern would increase capacity on Campbell Street, but current and projected volumes indicate that there is adequate capacity with the current striping plan. Side street capacity would remain the same or be lower.

A center refuge lane in the 5-lane section can also improve the safety of Campbell Street. By providing a refuge for left-turning vehicles, it can reduce the number of rear end accidents which occur when a vehicle stops in the left lane to make a turn and is hit by the vehicle behind it. It can also reduce the number of accidents caused by vehicles changing lanes to go around a stopped left-turning vehicle.

The 5-lane striping plan would eliminate on-street parking and would not allow for the any bike lanes to be added.

Cost: The cost for restriping Campbell Street is relatively low and is already done on a regular basis because the paint normally wears off the roadway over time.

Recommendation

Because of the many benefits of the 3-lane striping plan, we recommend revising the striping on Campbell Street to this format from the I-84 interchange to Main Street. The striping plan could be implemented for a test period of a year or so. If the community is unhappy with the way Campbell Street operates, it could return to the original striping plan or try another.

Pedestrian Improvements

Campbell Street between I-84 and Main Street is difficult for pedestrians to cross because it is very wide (64 feet). For an average pedestrian, it would take about 15 to 20 seconds to cross the entire street.

Although traffic signals would stop traffic so that pedestrians can cross the roadway, they do nothing to reduce the distance to be crossed. In addition, pedestrian volumes and traffic volumes would have to be high enough to meet the state warrants for installing a signal. Volumes at this time do not appear to meet these warrants for either the existing or future condition.

However, there are options for narrowing the crossing distance on the roadway, which would make it easier for pedestrians to cross Campbell Street.

Curb Extensions

Overview: Curb extensions, also called bulbs or flares, can be installed at any intersection where on-street parking is present. These extensions essentially bring the end of the sidewalk out so that it is even with the end of the parking lane, as shown in Figure 6-4. With 7-foot curb extensions on each side of Campbell street, the crossing distance for pedestrians would be reduced from 64 feet to 50 feet. Crossing time would be reduced to 12 to 15 seconds.

Traffic Projections: Adding curb extensions would have no effect on traffic volumes on the roadway.

Operations Analysis: Adding curb extensions would have no effect on intersection operations. The capacity for pedestrian crossing would increase because there would be more gaps in traffic adequate for the shorter crossing time.

Curb extensions can also make it easier for side street traffic to cross the highway. One reason is better visibility because the drivers at the approach can move further into the roadway to see around parked cars. They also have a shorter distance to cross the roadway with curb extensions.

Impacts: Curb extensions have many benefits and few problems. They generally improve pedestrian safety for several reasons. Shorter crossing distances mean that pedestrians are in the roadway for less time. Pedestrians are also more visible to traffic when they are standing on a curb extension than when they are on the side of a roadway where they can easily by blocked by parked cars.

Landscaping on curb extensions also has several benefits. It can improve the visual appearance of an area. It can also make the roadway appear narrower which makes drivers more conscious of speed and safety.

The main problem with curb extensions is making certain that the roadway will still drain correctly with a raised barrier on the corner. Snow removal is slightly more difficult with curb extensions but can still be accomplished.

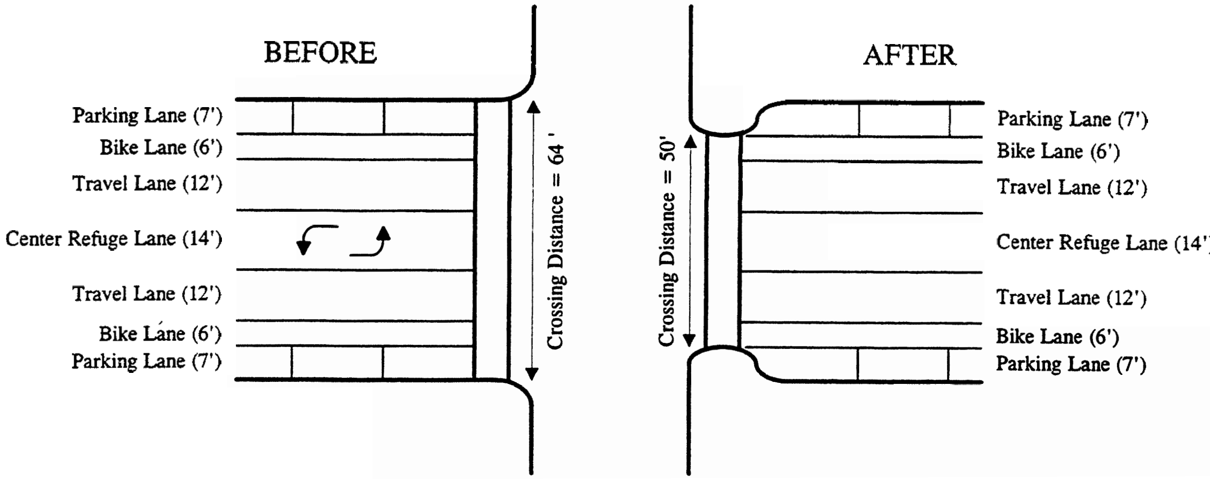
Cost: The cost of single curb extension is about $2,000. For all four corners of an intersection, the total cost would be about $8,000.

Median Islands

Overview: Median island refuges can be installed on wide streets to make it easier for pedestrians to cross. These island essentially provide a 4- to 8-foot wide refuge in the center of the roadway, allowing pedestrians to stop in the middle of the street. An example of a median is shown in Figure 6-4. With a median island in the center of Campbell Street, the crossing distance for pedestrians would be reduced

DAVID EVANS & ASSOCIATES, INC

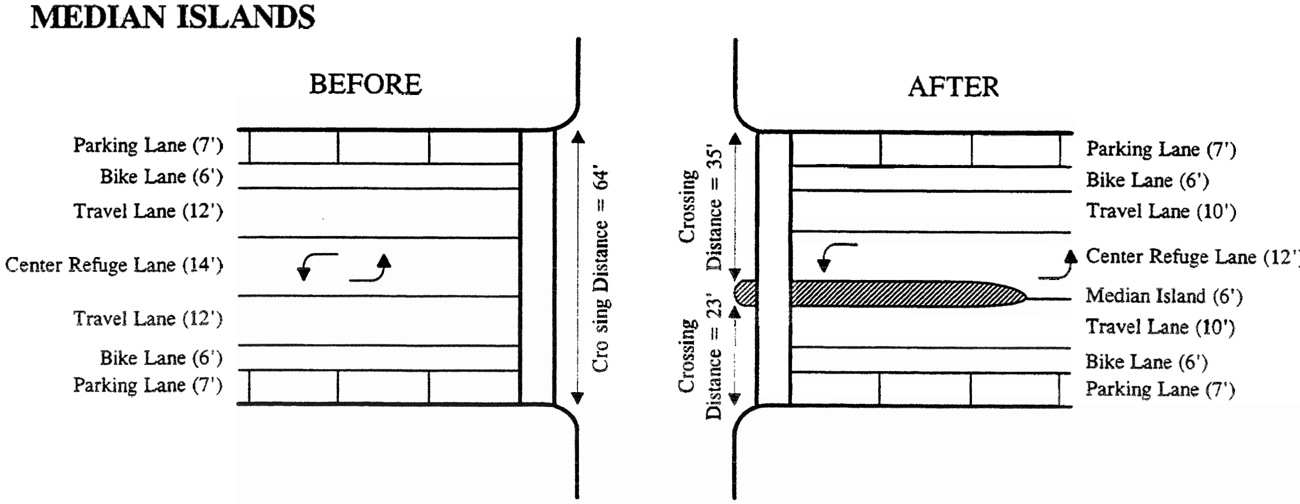
CURB EXTENSIONS



Advantages of curb extensions:

- Shortened crossing distance
- More visibility of and by pedestrians
- Improved alignment of crosswalks
- Shortened pedestrian phase at signalized intersections
- Place to put signal heads if easement is narrow

MEDIAN ISLANDS



Advantages of median islands:

- Shortened crossing distance
- Slower pedestrians who do not make it all the way across can safely wait for a second break in the traffic flow
- Fewer lanes to cross at one time
- Conflicts can be judged separately
- Shortened pedestrian phase at signals

FIGURE 6-4
EXAMPLES OF CURB EXTENSIONS AND MEDIAN ISLANDS

from 64 feet to two segments about 23 and 35 feet each. Crossing time would be reduced to 5 to 10 seconds for each segment.

Traffic Projections: Adding median islands would have no effect on traffic volumes on the roadway.

Operations Analysis: Adding median islands would have no effect on intersection operations. The capacity for pedestrian crossing would increase because there would be more gaps in traffic adequate for the shorter crossing time.

Impacts: Median islands have many benefits and some problems. They generally improve pedestrian safety for several reasons. Shorter crossing distances mean that pedestrians are in the roadway for less time. Pedestrians cross the street in two segments with a break in between, requiring a shorter gap in traffic.

Landscaping on median islands also has several benefits. It can improve the visual appearance of an area. It can also may the roadway appear narrower than it actually is which makes drivers more conscious of speed and safety.

One problem with median islands is that they can sometimes limit access to driveways close to an intersection by prohibiting left turns. This can be good sometimes because it can reduce the number of conflicting movements occurring in one area. It can have an impact on the businesses served by that driveway.

Snow removal is slightly more difficult with median islands but can still be accomplished.

Cost: The cost of a single median island is about $2,000. For islands on each side of an intersection, the total cost would be about $4,000.

Recommendation

Both curb extensions and median islands improve pedestrian safety and have relatively low costs. We recommend installing curb extensions at six intersections: Oak Street (four corners), Cedar Street (four corners), Grove Street (four corners), Walnut Street (two north corners), Resort Street (four corners), and Main Street (northwest and southwest corners). We recommend installing median islands at four intersections: Oak Street (two medians), Cedar Street (one median), Grove Street (two medians), and Resort Street (two medians). The total estimated cost for these improvements is $54,000. (This price excludes changes that may need to be made to the drainage system.)

Option 4. Improve Indiana Avenue to Eliminate Safety Hazards

Indiana Avenue is now serving as a connection for new development in the southwest quadrant of Baker City. East of 11th Street, it passes down into a gully and up the other side. The east side of the gully is very steep, and the grade on Indiana Avenue is very dangerous (16 percent).

Two variations were considered because of cost and impact to the area. These are:

Alternative A: Use Fill West of 11th Street to Reduce the Grade

Overview: Use fill at the bottom of the gully to bring the grade on Indiana Avenue to an acceptable level (7 percent).

Traffic Projections: No changes in traffic patterns would result from this improvement.

Operations Analysis: No changes in traffic operations would result from this improvement.

Impacts: The fill used to raise Indiana Avenue would extend into the gully on both the north and south sides. It would have some visual impacts to the golf course on the south side. The major benefit of this improvement would be the elimination of a significant safety hazard.

Cost: The estimated cost of Option 4, Alternative A is about $487,000.

Alternative B: Create a New Connection Between Indiana Avenue and Hillcrest Drive

Overview: This improvement would have two components: 1) a new connection through the gully between Indiana Avenue and Hillcrest Drive and 2) closure of Indiana Avenue between 11th Street and the new connection to all motorized vehicles. (Pedestrians and bicyclists could still use the closed section of Indiana Avenue.) The new connection would open the gully for development while providing a safe connection to the new development on Indiana Avenue.

Traffic Projections: The new connection would reduce the traffic on Indiana Avenue and shift it to Hillcrest Drive/11th Street. (Forecasts have not been shown for this improvement option since volume shifts would be relatively small.)

Operations Analysis: The level of service of Indiana Avenue at Highway 7 would be improved by the reduction in traffic on Indiana Avenue. The increase in volumes on 11th Street and Auburn Avenue would have a minimal effect on operations.

Impacts: The impacts of this improvement option would primarily be a slightly longer travel route for some of the traffic currently using Indiana Avenue. Right-of-way through the gully would need to be acquired from the adjacent landowners. The major benefit of this improvement would be the elimination of a significant safety hazard.

Cost: The estimated cost of Option 4, Alternative B is $444,000.

Recommendation

Both alternatives for this option have a similar cost, and both would eliminate the safety hazard. The advantage of Alternative B is that a new roadway which could serve the adjacent lands would be constructed as part of the project; Alternative A would only benefit the existing users of Indiana Avenue. Therefore, we recommend that Option 7, Alternative B be included in the street system plan as a high priority project.

Option 5. Connect Birch Street between Idlewood Drive and Campbell Street

Overview: Short segments of Birch Street have been constructed but the road is currently discontinuous. Since this is an area which is experiencing some active residential development, maintaining the grid system by connecting the existing segments should be evaluated.

Two segments of roadway would need to be completed to make Birch Street a continuous roadway. The north section would connect between Idlewood Drive and a stub north of H Street. The south section would connect between D Street and Campbell Street.

Traffic Projections: Connecting these segments of Birch Street would improve the grid system, providing several routes for traffic generated in the area to travel around the city. It would allow traffic to travel directly south from the new residential areas to Campbell Street. If traffic crossed Campbell Street and headed further south, it could use Washington Street or Auburn Street to access downtown Baker City. These route options would result in small shifts in traffic off several other routes. (Forecasts have not been shown since volume shifts would be relatively small.)

Operations Analysis: By providing a variety of route options for the new development occurring along the Birch Street corridor, these connections would result in small traffic reductions on several roadways. Consequently, there would be minor improvements in operations of the transportation system.

Impacts: This improvement option has no measurable impacts. A potential benefit might include a reduction in energy consumption by providing more direct routes to some areas of the city. It would also provide more direct pedestrian and bicycle connections to Campbell Street and areas south from the new development.

The southern connection would require some right-of-way acquisition which may be difficult near Campbell Street.

Cost: The north section cost estimate is about $200,000, and the south section cost estimate is about $550,000.

Recommendation: Both the north and south segments of Birch Street should be constructed but they should be constructed as development occurs. (Development around the north section has already identified the need for the connection and it may be constructed as this plan is adopted.)

Option 6. Extend Main Street to Create a "Parkway" Connection to Highway 86

This improvement option is intended to tap into the tourism associated with the Oregon Trail Visitors Center by providing a direct connection between downtown Baker City and the Highway 86 access road to the center. A direct connection would reduce the need for visitors to get on I-84 at Exit 302 and then use Campbell Street (Exit 304) to get into downtown Baker City.

Two variations were considered because of cost and the conflict with statewide planning goals. These are:

Alternative A: Connect near Exit 302 with I-84

Overview: Extend Main Street northwards across the Powder River to Hughes Lane and then turn north eastward to connect with Highway 86 and Exit 302 of I-84. This connection could be developed as a "parkway" with limited access and attractive landscaping. Another option for development could be a "boulevard" with mainline roadways and service roads. The "boulevard" option would allow local access while providing unimpeded travel for through traffic.

Traffic Projections: Traffic modeling of this option indicates that approximately 250 vehicles would shift from Cedar Street and Campbell Street to the Main Street extension during the PM peak hour, as shown in Figure 6-5.

Operations Analysis: Operations along Campbell Street would improve as a result of the shift in traffic to the Main Street extension.

Impacts: This improvement would bring traffic into a neighborhood that currently has very low traffic volumes (Main Street north of Campbell Street). Increased traffic volumes would result in higher noise levels and slightly worse air quality. Another potential environmental impact would center around the Powder River crossing, where water quality could be affected by run-off.

Another conflict of the economic impact of this option would include a shift in traffic away from Campbell Street and North Baker businesses. This shift in traffic could result in a significant loss of patronage for some of these businesses.

At the same time, the connection would shift traffic towards downtown. It might also bring additional traffic into Baker City that might otherwise get on I-84 and travel to another city before stopping.

A conflict would also exist with River Park currently in the planning process. This park would provide open space and multi-use trails along a portion of the Powder River. The Main Street extension could interfere with the development of this park.

One of the biggest concerns about this improvement option is the portion of the roadway which would lie outside of the UGB. To build outside of the UGB may require exceptions to state-wide planning goals 3 (agricultural lands), 11 (public facilities and services), and 14 (urbanization).

Cost: The estimated cost of Option 6, Alternative A is $4.6 million.

Alternative B: Connect with Hughes Lane

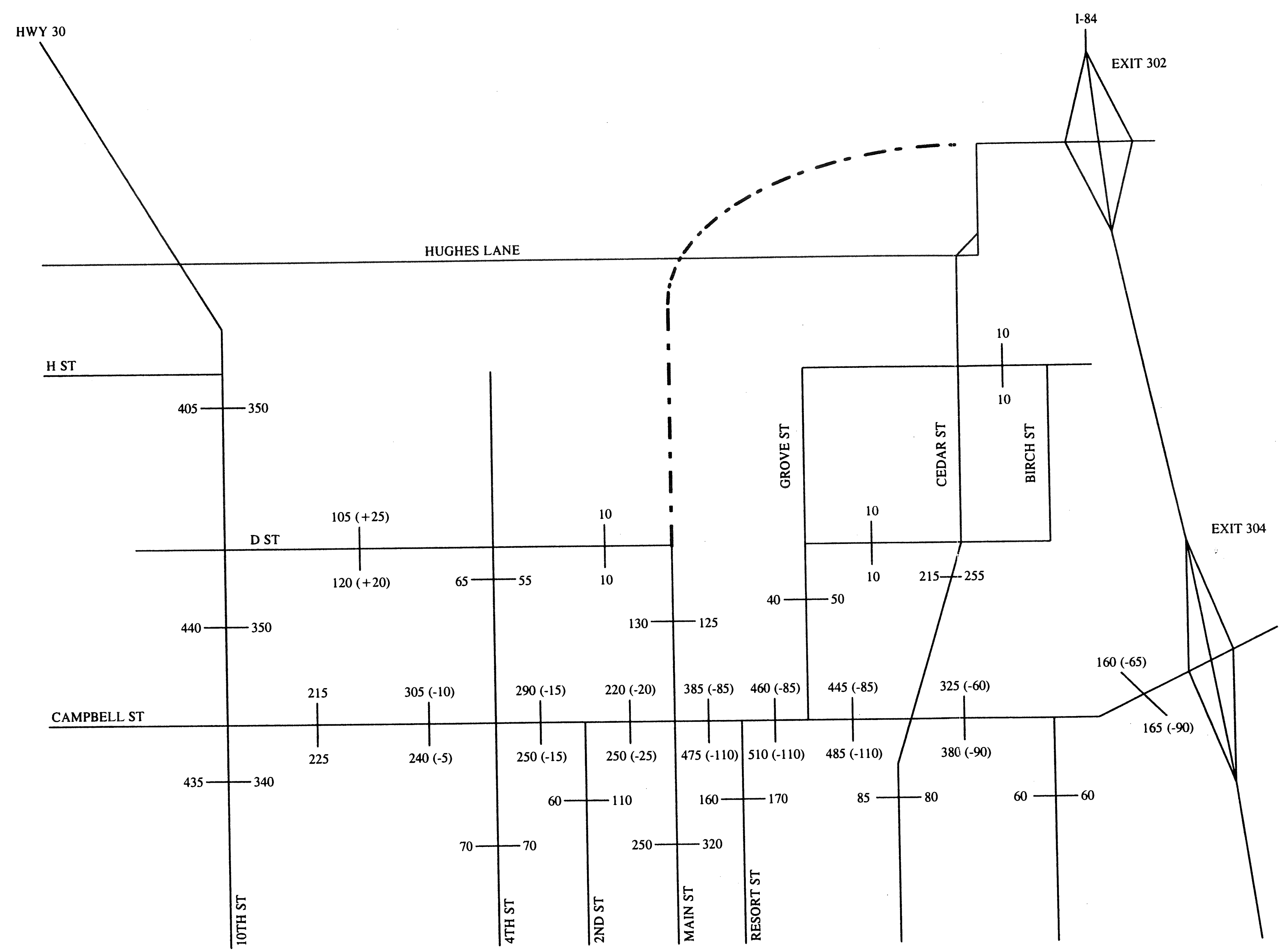
Overview: Extend Main Street northwards across the Powder River to Hughes Lane. Use Hughes Lane and Cedar Street to connect with Highway 86 at Exit 302. This connection could also be developed as either a "parkway" or "boulevard" with access control and attractive landscaping. Alternative B was reviewed because, unlike Alternative A, it would remain wholly within the UGB.

Traffic Projections: Because this route would be less direct and slightly longer than the Alternative A route, the shift in traffic from Cedar Street and Campbell Street to the Main Street extension is expected to be 20 to 30 percent lower, during the PM peak hour.

Operations Analysis: Operations along Campbell Street would still improve as a result of the shift in traffic to the Main Street extension.

IMPROVEMENT OPTION

MAIN STREET PARKWAY



NOT TO SCALE

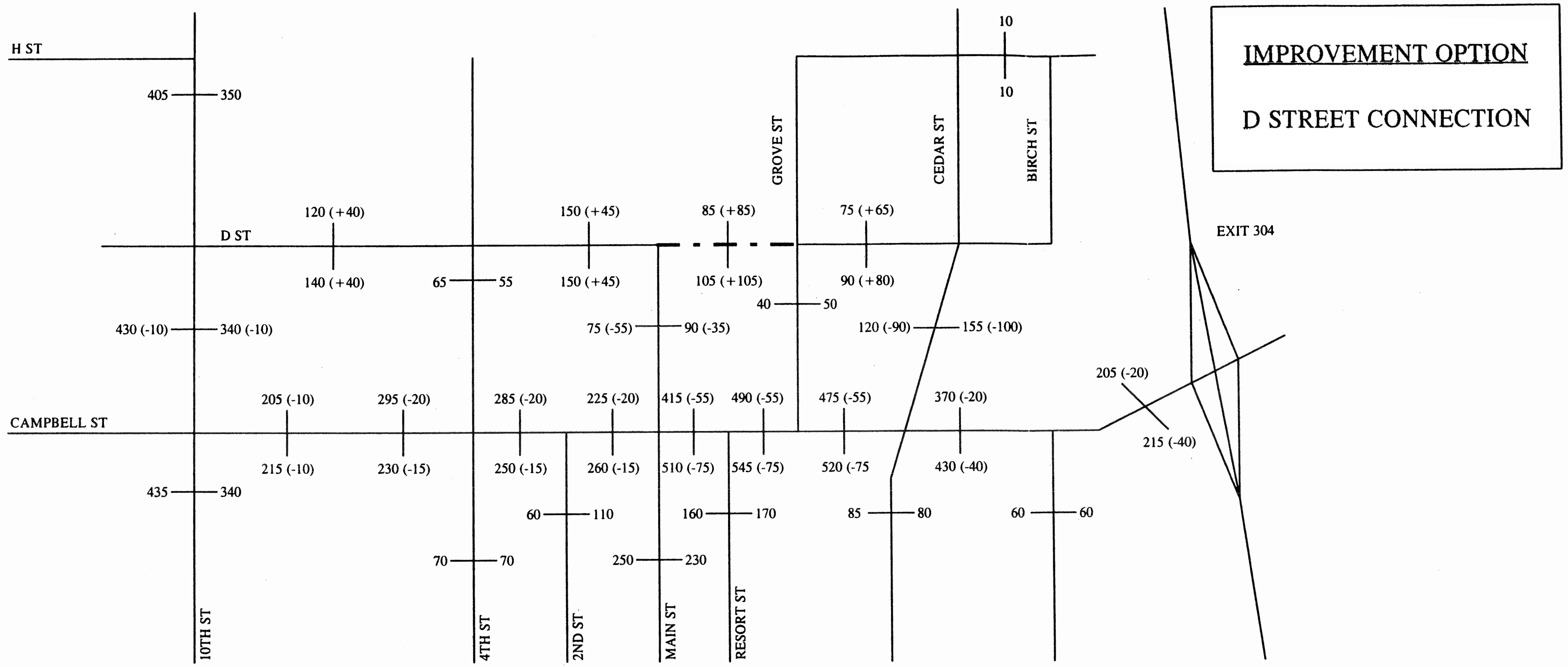
LEGEND

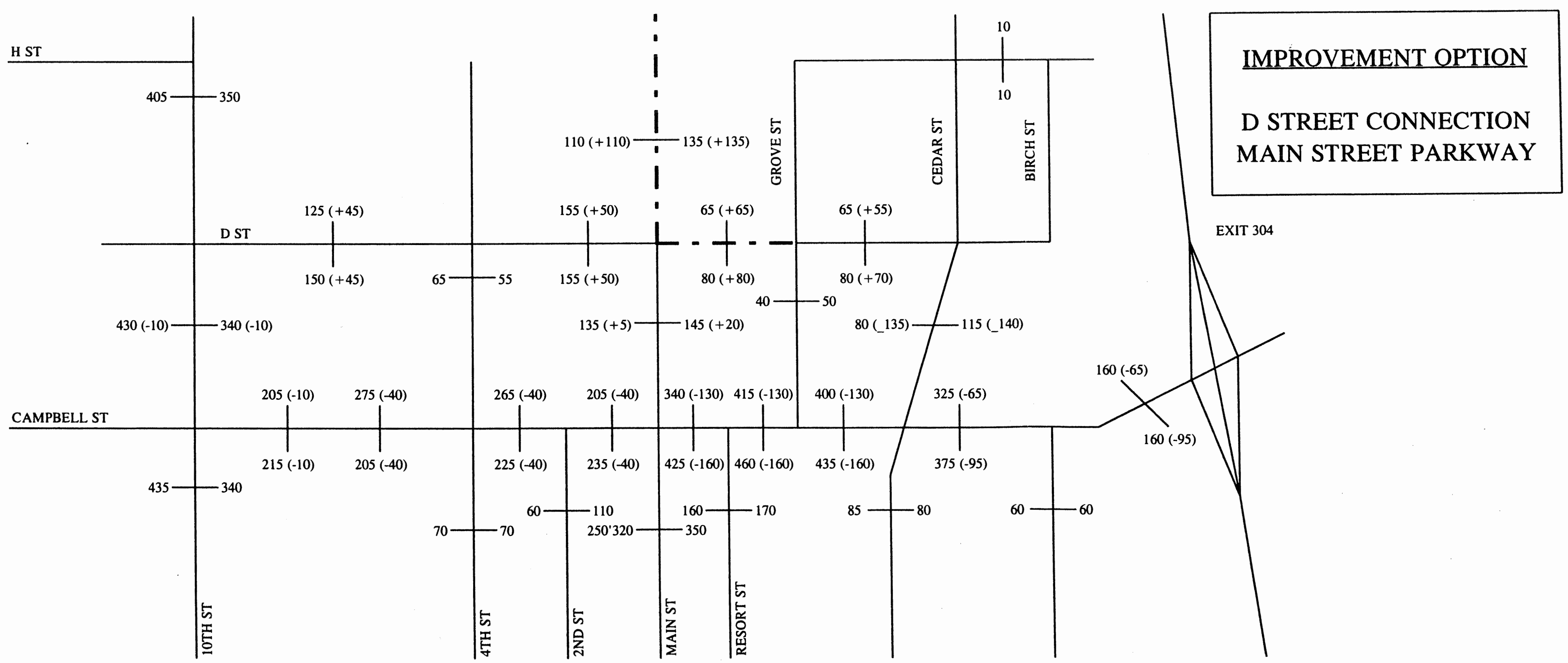
215 —— 255
NORTHBOUND PM PEAK HOUR ONE-WAY TRAFFIC VOLUME
SOUTHBOUND PM PEAK HOUR ONE-WAY TRAFFIC VOLUME

325 (-60) WESTBOUND PM PEAK HOUR ONE-WAY TRAFFIC VOLUME
380 (-90) EASTBOUND PM PEAK HOUR ONE-WAY TRAFFIC VOLUME

POTENTIAL NEW ROADWAY

FIGURE 6-5
2015 IMPROVEMENT OPTION 6
PM PEAK HOUR TRAFFIC VOLUMES





LEGEND

- 60 — 60: NORTHBOUND PM PEAK HOUR ONE-WAY TRAFFIC VOLUME
- SOUTHBOUND PM PEAK HOUR ONE-WAY TRAFFIC VOLUME
- 370 (-20): WESTBOUND PM PEAK HOUR ONE-WAY TRAFFIC VOLUME
- 430 (-40): EASTBOUND PM PEAK HOUR ONE-WAY TRAFFIC VOLUME
- — · — · POTENTIAL NEW ROADWAY

NOT TO SCALE

FIGURE 6-6
2015 IMPROVEMENT OPTION 7
PM PEAK HOUR TRAFFIC VOLUMES

Impacts: Impacts for this improvement would be the same as those for Alternative A except that the roadway would be wholly within the UGB and would not require any goal exceptions.

Cost: The estimated cost of Option 6, Alternative B is $3.76 million. Improvements to Hughes Lane and Cedar Street were not included in the estimated cost.

Recommendation

Both alternatives for this option present a high cost versus a moderate benefit with the present growth projections for Baker City; however, it need not be excluded entirely from a long-range vision of the transportation system. Should growth patterns change, particularly if the commercially zoned land east of I-84 develops, the Main Street extension could become a higher priority project. With current projections, this improvement could be included in the plan as a long-term goal for the city, built at some time beyond the 20-year planning horizon.

Option 7. Connect D Street between Main Street and Walnut Street

Overview: This improvement would connect D Street between Main Street and Walnut Street, by bridging the Powder River and fill in a missing link between Grove Street and Elm Street. With the connection, D Street would be a continuous roadway between Birch Street and 13th Street. It would provide a nearby parallel route to Campbell Street for local residential traffic to use for access to other roadways downtown or across to the west side of the city. As the area east of the Powder River develops, this connection will become increasingly important.

Traffic Projections: Figure 6-6 shows the traffic projections for the D Street connection alone and with the Main Street extension. Traffic modeling of this option indicates that between 80 and 190 vehicles would shift from Campbell Street and other roadways to D Street during the PM peak hour for this improvement alone. In conjunction with the Main Street extension, shifts are projected to be about 90 to 150 vehicles.

Operations Analysis: Operations along Campbell Street would improve as a result of the shift in traffic to D Street. Some of the side street operations would increase form LOS D to LOS C because of the lower volumes on Campbell Street.

Impacts: Some impacts could arise from this improvement; most would be minor. Increased traffic on D Street would result in higher noise levels, but D Street is designated as a collector roadway in the comprehensive plan. The largest potential environmental impact would center around the Powder River crossing, where water quality could be affected by run-off.

This D Street option would also have a potential conflict with the Main Street extension. Both improvements would cross the Powder River at approximately the same location. This conflict could be alleviated with a single carefully planned crossing.

The D Street connection has been included in past comprehensive plans and right-of-way has been reserved.

Cost: The estimated cost of the D Street connection is about $1.6 million.

Recommendation: The D Street connection would relieve traffic on Campbell Street and connect the northeast and northwest quadrants Baker City. Therefore, it should be included in the street system plan as a medium priority project.

Option 8. Connect H Street between Best Frontage Road and 10th Street

Overview: This improvement would create a continuous roadway along the H Street alignment between Best Frontage Road and 10th Street. Two new roadway segments would need to be constructed. An overpass across I-84 would connect Best Frontage Road and a stub of H Street on the west side of the interstate. A second segment would begin at the H Street stub east of the Powder River, bridge over the river, swing north to avoid the tennis courts, most of the high school fields, and the development along Riverpark Drive, and connect with a stub east of 8th Drive. Riverpark Drive itself cannot be used because it is part of an old development, and the streets are too narrow.

The improvement has several benefits. First, it would provide another east-west collector roadway on the north side of the city which could serve both existing and future development. Second, it would provide a connection between the land zoned for commercial development on the east side of I-84, along Best Frontage Road, and the residential neighborhoods to the north. Third, it would provide a parallel route to Campbell Street. And last, it would provide a grade-separated crossing of I-84, allowing for continued safe operations of the I-84 access ramps at Exits 302 and 304.

Figure 6-7 shows the traffic projections for the H Street connections alone and with the Main Street extension. Traffic modeling of this option indicates that between 200 and 245 vehicles would shift from Campbell Street and other roadways to H Street during the PM peak hour for this improvement alone. This shift is slightly higher than the shift of 80 to 190 vehicles projected for D Street alone.

In conjunction with the Main Street extension, shifts are projected to be about 160 to 280 vehicles. This shift is higher than the than the shift of 90 to 150 vehicles projected for D Street with the Main Street extension.

Operations Analysis: Operations along Campbell Street would improve as a result of the shift in traffic to H Street. Some of the side street operations would increase form LOS D to LOS C because of the lower volumes on Campbell Street.

Impacts: Some impacts could arise from this improvement. The largest potential environmental impact would center around the Powder River crossing, where water quality could be affected by run-off.

Near Baker High School some of the playing fields would be affected by the new roadway. Extending H Street would bisect the school property separating the playing fields from the rest of the school. This would require children to cross a roadway to access the fields.

Cost: The combined cost of the H Street connections is estimated at about $5.4 million. The overpass connecting Best Frontage Road with the street system west of I-84 is estimated at $2.9 million. Rebuilding the existing segments of H Street from I-84 to 10th Street and constructing the new connections is estimated at $2.5 million.

Recommendation: The H Street connection would relieve traffic on Campbell Street, connect the northeast and northwest quadrants Baker City, and provide another collector roadway on the north side of the city.

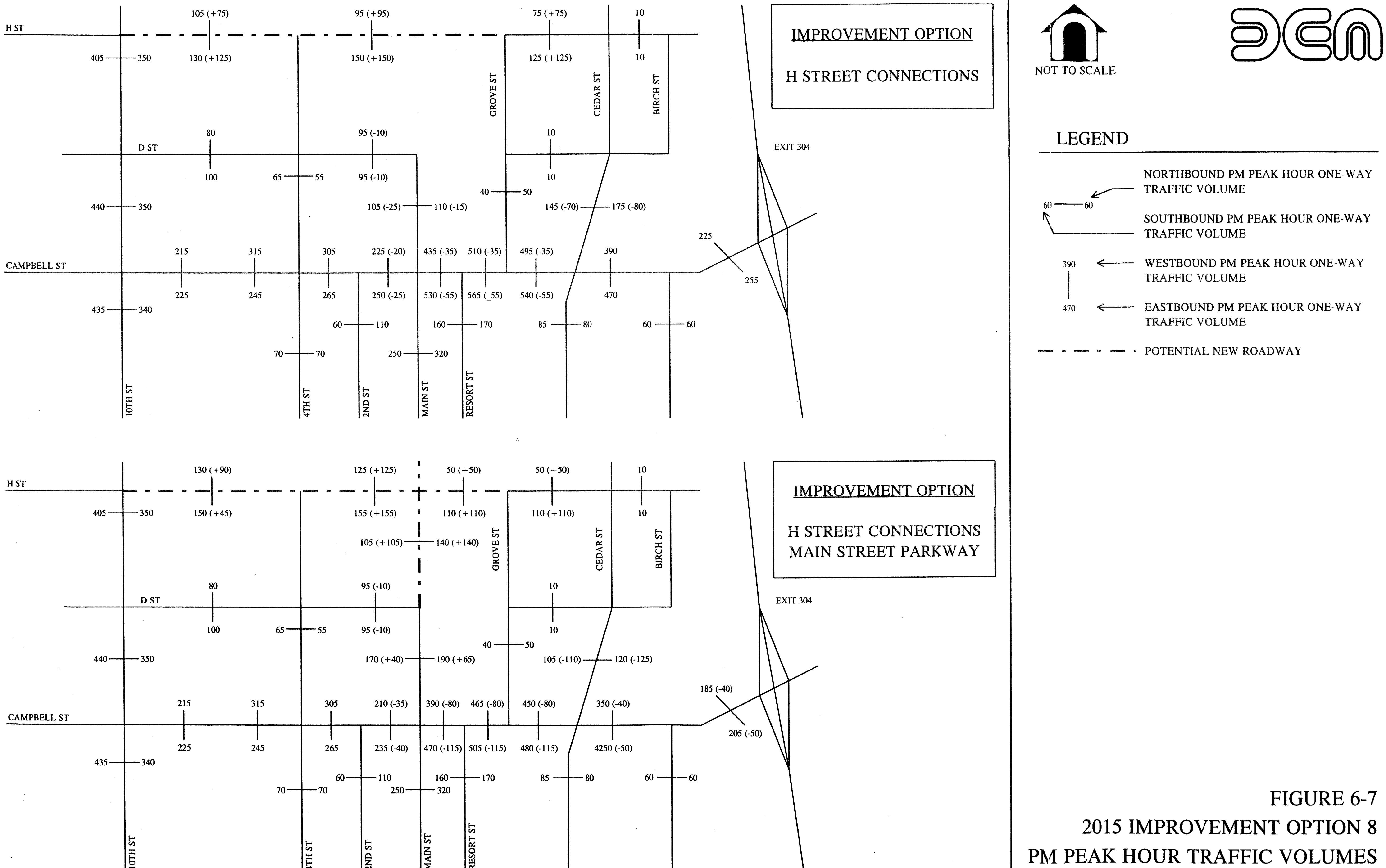


FIGURE 6-7
2015 IMPROVEMENT OPTION 8
PM PEAK HOUR TRAFFIC VOLUMES

SUMMARY

Table 6-6 summarizes the recommendations of the street system modal plan based on the evaluation process described in this chapter. Chapter 7 discusses how these improvement options fit into the modal plans for the Baker City area.

Table 6-6
Transportation Improvement Options: Recommendation Summary

Option	Recommendation
1. Zoning and Development Code Revisions	• Implement
2. Transportation Demand Management Strategies	• Implement
3. Campbell Street Improvements	• Implement 3-lane striping plan on a trial basis as a high priority project • Implement pedestrian improvements as a high priority project
4. Indiana Avenue Improvements	• Implement the new connection between Indiana Avenue and Hillcrest Drive (Alternative B) as a high priority project.
5. Birch Street Connections	• Implement connection between Idlewood Drive and H Street as a high priority project • Implement connection between D Street and Campbell Street as a medium priority project
6. Main Street Extension to Highway 86	• Identify as a potential project occurring beyond the 20-year planning horizon
7. D Street Connection	• Implement as a medium priority project
8. H Street Connections	• Implement the connection between the stub west of I-84 and 10th Street as a medium priority project • Identify the I-84 overpass and connection to Best Frontage Road as a potential project dependent on development of the region, probably occurring beyond the 20-year planning horizon
9. Southeast Connector	• Identify as a potential project dependent on development of the region, probably occurring beyond the 20-year planning horizon

Therefore, it should be included in the street system plan. Because of its high costs, we recommend constructing it in a phased process. The first phase, a medium priority project should include the improvements from the stub west of I-84 to 10th Street. The I-84 overpass and connection to Best Frontage Road should be a low priority project with construction hinging on the development of the commercial land east of I-84. Since the demographic analysis did not project development of this property during the next 20 years, this phase of the improvement would probably occur beyond the 20-year planning horizon.

Option 9. Create a Southeast Connector between Highway 7 and Highway 30

Overview: This option would create a connection between Highway 7 and Highway 30 in the southeast quadrant of Baker City. The purpose of the connection would be to provide a shorter route between Highway 7 and I-84, and, at the same time, reduce the number of trucks through town by routing them onto I-84 at Exit 306.

The alignment of this roadway is unfixed, but one option would use the southern part of Industrial Avenue, bear eastward to cross the Powder River, and connect with Highway 30 north of South Bridge Street. Actual alignments would depend on the development of the surrounding land and how the connection might both pass through and serve that development.

Traffic Projections: Very little traffic was projected to travel on the southeast connector because existing volumes between south Highway 7 and south Highway 30 are very low. Less than 60 vehicles were projected to use the roadway during the PM peak hour. (Forecasts have not been shown for this improvement options since volume shifts would be relatively small.)

Operations Analysis: Because traffic projections for the southeast connector are very low, and little relief would be provided to other roadways, traffic operations on most of the system would be about the same as calculated for the "No Build" scenario.

Impacts: There are several impacts and benefits to this project. One benefit would include a shorter route between the two highways, which would reduce energy consumption. Another benefit would be a roadway through the southeast quadrant of the city which could open up some new areas for industrial development. A potential water impact would exist due to the roadway run-off on the bridge crossing the Powder River. An at-grade railroad crossing very close to Highway 30 would also be required.

Cost: The cost of the southeast connector is estimated at $3.4 million.

Recommendation: The cost for this improvement is very high for a small benefit. Therefore, the southeast connector should only be included in the plan as a low priority project hinging on the development of adjacent land and the ability to acquire all or partial funding from adjacent property owners. Since the demographic analysis did not project significant development of this area during the next 20 years, this improvement would probably occur beyond the 20-year planning horizon.

CHAPTER 7: TRANSPORTATION SYSTEM PLAN

The purpose of this chapter is to provide detailed operational plans for each of the transportation systems within the community. The Baker City Transportation System Plan covers all the transportation modes that exist and are interconnected throughout the urban area. Components of the street system plan include street classification standards, access management recommendations, transportation demand management measures, modal plans, and a system plan implementation program.

EXISTING STREET CLASSIFICATION STANDARDS

Street classification standards relate the design of a roadway to its function. The function is determined by operational characteristics such as traffic volume, operating speed, safety, and capacity. Street standards are necessary to provide a community with roadways which are relatively safe, aesthetic, and easy to administer when new roadways are planned or constructed. They are based on experience, and policies and publications of the profession.

Existing Baker City ordinances require a basic minimum right-of-way of 50-60 feet for residential streets, and 60-80 for collector and arterial streets. The Baker City Standard Specifications (1995) include typical section drawings for five types of streets within the city: arterial, primary residential street, secondary residential street, alley, and residential cul-de-sac. The Standard Specifications show a minimum 44-foot paved width for an arterial, 36-foot paved width for a primary residential street, 32-foot paved width for a secondary residential street (included two 4-foot paved shoulders), and varied width for a residential cul-de-sac (40 foot minimum bulb radius). No width specifications are given for an alley. Curbs are specified for the arterial and primary residential streets.

The street specifications do not include sidewalks as part of the cross-section, although separate drawings for sidewalks and ADA-standard curb cuts are provided, showing a 5-foot minimum width, except for historical areas, which have a 6-foot minimum width. Bikeways are not shown.

Existing Baker County Ordinances require a minimum of 60-feet of right-of-way for all public streets. Generally, County roads are required to have two 12-foot travel lanes and two 4-foot shoulders. Shoulders are not required to be paved.

The development of the Baker City Transportation System Plan provides the City and County with an opportunity to review and revise street design standards to more closely fit with the functional street classification, and the goals and objectives of the Transportation System Plan. The recommended street standards are shown graphically in Figure 7-1, summarized in Table 7-1 and described in detail on the following pages. Since the Baker City Transportation System Plan includes land within the UGB, urban road standards should be applied in these outlying areas as well. Although portions of the city, especially outside the City Boundary, may presently have a rural appearance, these lands will ultimately be part of the urban area. Retrofitting rural streets to urban standards in the future is expensive and controversial; it is better to initially build them to an acceptable urban standard.

Table 7-1
Recommended Street Standards for Baker City

Classification	Pavement Width	Right-of-Way Width	Min. Posted Speed
URBAN			
Local Residential	32 ft	54 ft	15-25 mph
Collector	48 ft	72 ft	25-35 mph
Arterial	50 ft	80 ft	25-45 mph
Downtown Commercial	48 ft	74 ft	15-25 mph
Alleys	20-24 ft	20-24 ft	15 mph
RURAL			
Local Residential	24-36 ft	60 ft	25 mph
Collector	32-36 ft	60 ft	25-35 mph
Arterial	36-40 ft	60 ft	35-55 mph

RECOMMENDED URBAN STREET STANDARDS

Urban Residential Streets (Replaces Secondary Residential Streets)

The design of a residential street affects its traffic operation, safety, and livability. The residential street should be designed to enhance the livability of the neighborhood as well as to accommodate less than 1,200 vehicles per day. Design speeds should be 15-25 MPH. When traffic volumes exceed approximately 1,000 to 1,200 vehicles per day, the residents on that street will begin to notice the traffic as a noise and safety problem. To maintain neighborhoods, local residential streets should be designed to encourage low speed travel and to discourage through traffic.

A good, well-connected grid system of relatively short blocks can minimize excessive volumes of motor vehicles by providing a series of equally attractive or restrictive travel options. This street pattern is also beneficial to pedestrians and bicyclists.

The standard for a local residential street should be a 28- to 32-foot roadway, curb face-to-curb face within a 50- to 54-foot right-of-way, as shown on Figure 7-1, Sections A and B. Five-foot wide sidewalks should be provided on each side of the roadway, located one foot from the right-of-way line to provide a five-foot planting strip.

The 32-foot cross section will accommodate passage of two lanes of moving traffic in each direction with curb parking on both sides. The 28-foot cross section will allow parking on one side. On low volume residential streets where curb parking may occur on both sides of the street, traffic will move freely but slowly. Narrower streets improve neighborhood aesthetics and discourage speeding and through traffic. They also reduce right-of-way needs, construction costs, storm water run-off, and the need to clear vegetation.

Sidewalks must be included on all urban streets as an important component of the pedestrian system. When sidewalks are located directly adjacent to the curb, they can include such impediments as mailboxes, street light standards, and sign poles, which reduce the effective width of the walk. Sidewalks buffered from the street by a planting strip eliminate obstructions in the walkway, provide a more pleasing design as well as a buffer from traffic, and make the sidewalk more useable by disabled persons. To maintain a safe and convenient walkway for at least two adults, a five-foot sidewalk should be used in residential areas.

Cul-de-sac, or "dead-end" residential streets are intended to serve only the adjacent land in residential neighborhoods. These streets should be short, serving a maximum of 20 single family houses. Because the streets are short and the traffic volumes relatively low, the street width can be narrower than a standard residential street, allowing for the passage of two lanes of traffic when no vehicles are parked at the curb or one lane of traffic when vehicles are parked at the curb.

The street width of a cul-de-sac should be 24 feet, curb face-to-curb face within a 40-foot right-of-way, as shown in Figure 7-1, Section C. A five-foot-wide sidewalk should be located one foot from the right-of-way line on each side of the roadway, providing a five-foot planting strip.

Because cul-de-sac streets limit street and neighborhood connectivity, they should only be used where topographical or other environmental constraints prevent street connections. Where cul-de-sacs must be used, pedestrian and bicycle connections to adjacent cul-de-sacs or through streets should be included.

Urban Collector Streets (Replaces Primary Residential Streets)

Major Collector

Major collectors are intended to carry between 1,200 and 10,000 vehicles per day, including limited through traffic, at a design speed of 35 MPH. A collector can serve residential, commercial, industrial, or mixed land uses. Major collectors focus on connecting arterials, typically in higher volume commercial areas.

Figure 7-1, Section E shows a cross section with a 72-foot right-of-way and a 48-foot paved width. The 48-foot curb-to-curb distance allows two travel lanes, two bicycle lanes, and parking on both sides of the street. The roadway can also be striped to provide two travel lanes plus left-turn lanes at intersections or driveways by removing parking for short distances.

Six-foot sidewalks should be provided on each side of the roadway, one foot from the right-of-way line to allow a five-foot-wide planting strip. In commercial or business areas, the sidewalks may be eight feet wide or extend to the property line, and may be located adjacent to the curb to facilitate loading and unloading at the curb.

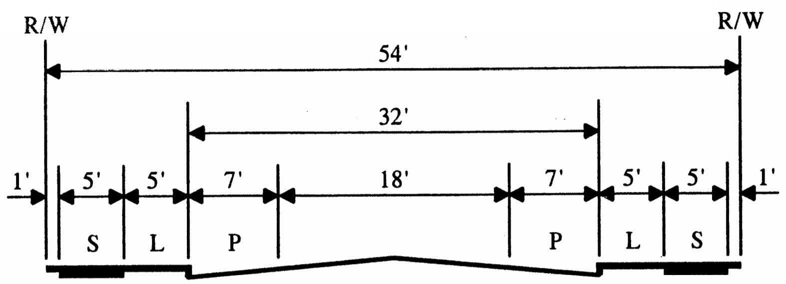
If traffic volume forecasts exceed 5,000 vehicles per day on a collector, then driveways serving single or multi-family houses should not be permitted on that section.

Minor Collector

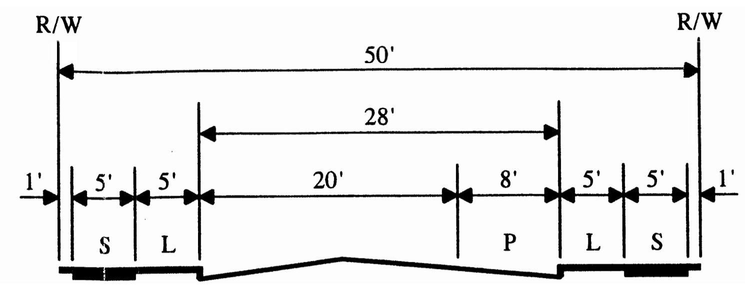
Minor collectors are primarily intended to serve local access needs of residential neighborhoods through connecting local streets to arterials. Minor collectors are intended to carry less than 1,200 vehicles per day, with a design speed of 25 MPH. Minor collectors may be traffic calmed to slow speeds. Sidewalks are provided, but bike lanes are typically not needed due to slower traffic speeds.

DAVID EVANS & ASSOCIATES, INC

A. URBAN RESIDENTIAL STREET (32')



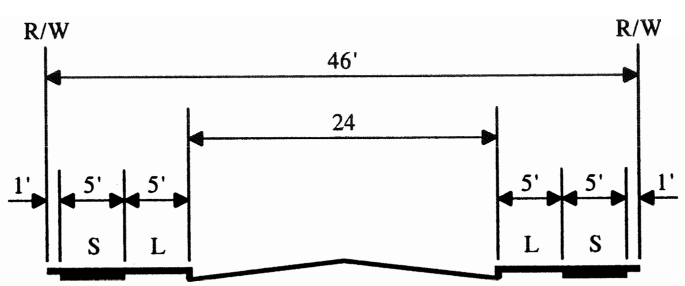
B. URBAN RESIDENTIAL STREET (28')



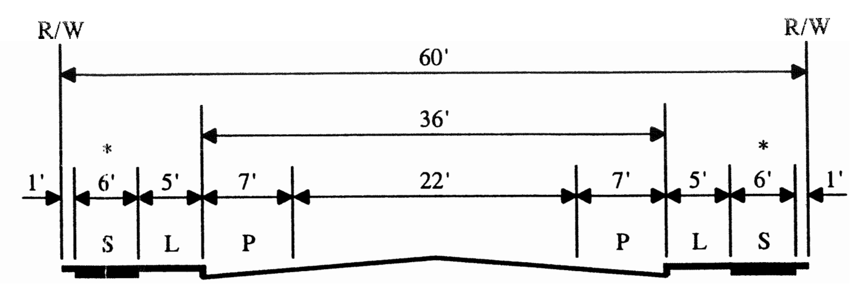
LEGEND

B = BIKE LANE
P = PARKING
S = SIDEWALK
L = LANDSCAPE STRIP
R/W = RIGHT-OF-WAY LINE

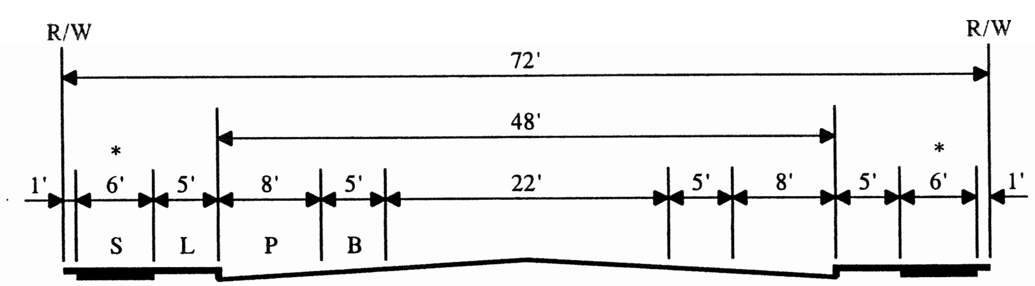
C. URBAN RESIDENTIAL CUL-DE-SAC



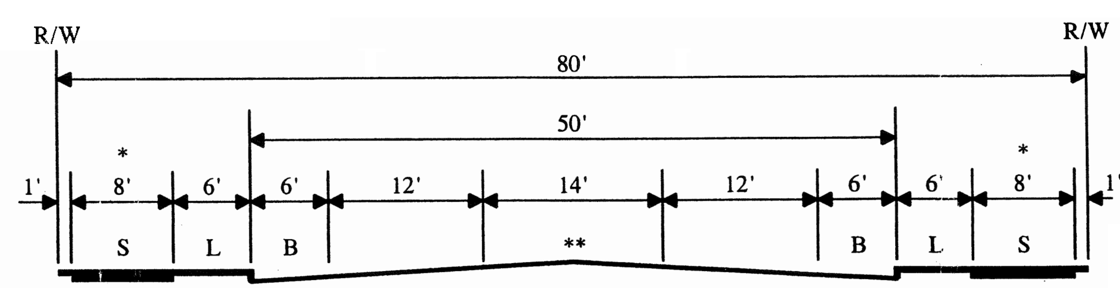
D. URBAN MINOR COLLECTOR STREET



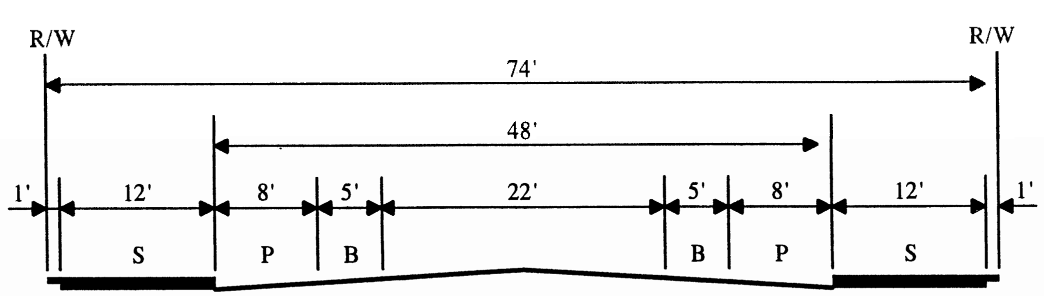
E. URBAN MAJOR COLLECTOR STREET



F. URBAN ARTERIAL STREET



G. DOWNTOWN COMMERCIAL STREET



* IN COMMERCIAL AREAS, SIDEWALK CAN BE 8 FEET WIDE AND ADJACENT TO CURB. ALL OTHER LOCATIONS, SIDEWALK IS 6 OR 8 FEET WIDE AND LOCATED 5 FEET FROM THE CURB FACE.

** OPTIONAL RAISED MEDIAN, 10 FEET WIDE CURB FACE-TO-CURB FACE.

FIGURE 7-1
URBAN STREET
DESIGN STANDARDS

Figure 7-1, Section D shows a cross section with a 60-foot right-of-way and a 36-foot paved width. The 36-foot curb-to-curb distance allows two travel lanes and parking on both sides of the street. Six-foot sidewalks should be provided on each side of the roadway, one foot from the right-of-way line to allow a five-foot-wide planting strip. In commercial or business areas, the sidewalks may be eight feet wide or extend to the property line, and may be located adjacent to the curb to facilitate loading and unloading at the curb.

Urban Arterial Streets

Arterial streets form the primary roadway network within and through a region. They provide a continuous roadway system that distributes traffic between different neighborhoods and districts. Generally, arterial streets are higher capacity roadways that carry high traffic volumes with minimal localized activity. Design speeds should be between 25 and 45 MPH. Residential property should not face or be provided with access onto arterial streets.

Two-way arterial streets should consist of two or three-lane cross sections; therefore, 80 feet of Right-of-Way should be reserved, as shown on Figure 7-1, Section F. A 50-foot paved width should provide two 12-foot travel lanes, two six-foot bike lanes, and a 14-foot center refuge lane, if needed. It should be noted that the inclusion of a center turn lane should be unnecessary in most situations if the access management standards for arterial streets described below are followed. Five-lane sections should be avoided with the urban area because they become barriers that tend to divide communities.

The 14-foot-wide center refuge lane could also be developed with a raised median between left-turn lanes. The raised median should be 10 feet wide curb face-to-curb face, and the adjacent travel lanes should be widened to 14 feet.

Sidewalks along arterial streets should be at least eight feet wide and located five feet from the curb face to provide a planting strip.

In the event that Main Street is extended north of its current terminus in the future beyond the 20-year planning horizon, Baker City should consider a "boulevard" design. This design provides middle lanes for through movements, flanked by two "local" or "frontage" streets that provide for local movements, lower volumes and speeds, and frequent local street connections. Boulevards such as this are common in European cities, and promote local access and a lively street scene while protecting through traffic movements.

Urban Downtown Commercial Streets

Streets that serve the downtown core of a city such as Baker City must meet special demands for on-street parking and pedestrian comfort and accessibility. Figure 7-1, Section G shows a typical cross-section for a downtown commercial street. If possible, sidewalks should be 12 feet wide, and such details as clearly marked crossings, curb extensions, street furniture and landscaping should be included. Diagonal parking should be avoided if possible, and five-foot bike lanes provided.

Alleys

Alleyways can be a useful way to diminish street width by providing rear access and parking to residential areas. Including alleys in a subdivision design allows homes to be placed closer to the street and eliminates the need for garages to be the dominant architectural feature. This pattern, once common, has been recently revived as a way to build better neighborhoods. In addition, alleys can be useful in commercial and industrial areas, allowing access by delivery trucks that is off of the main streets. Alleys should be encouraged in the urban area of Baker City. Alleys should be 15-20 feet wide, with a 20-foot right-of-way.

Urban Bike Lanes

In cases where a bikeway is proposed within the street right-of-way, 10-12 feet of roadway pavement (between curbs) should be provided for a five-foot bikeway (major collector streets) or a six-foot bikeway (arterial streets) on each side of the street, as shown on the cross sections in Figure 7-1. Except in rare circumstances, bike lanes on one-way streets should be located on the right side of the roadway, be one-way, and flow in the same direction as vehicular traffic. The striping should be done in conformance with the State Bicycle and Pedestrian Plan (1995). In cases where curb parking will exist with a bike lane, the bike lane will be located between the parking and travel lanes. In some situations, curb parking may have to be removed to permit a bike lane.

The bikeways on new streets or streets to be improved as part of the street system plan should be added when the improvements are made. The implementation program identifies an approximate schedule for these improvements.

On arterial and collector streets that are not scheduled to be improved as part of the street system plan, bike lanes may be added to the existing roadway at any time to encourage cycling, or when forecast traffic volumes exceed 2,500 to 3,000 vehicles per day. The striping of bike lanes on streets which lead directly to schools should be high priority.

Urban Sidewalks

A complete pedestrian system should be implemented in the urban portion of the Baker City planning area. Every urban street should have sidewalks on both sides of the roadway as shown on the cross sections in Figure 7-1. Sidewalks on residential streets should have a five-foot wide paved width with a five-foot wide planting strip separating it from the street. Collector streets should have six-foot wide sidewalks with five-foot planting strips. Arterial streets should have eight-foot sidewalks with a six-foot planting strip, and downtown commercial streets should have 12-foot wide curb sidewalks. In addition, pedestrian and bicycle connections should be provided between any cul-de-sac or other dead-end streets.

Another essential component of the urban sidewalk system is street crossings. Intersections must be designed to provide safe and comfortable crossing opportunities. This includes not only signal timing (to ensure adequate crossing time) and crosswalks, but also such enhancements as curb extensions and center medians.

Urban Curb Parking Restrictions

Curb parking should be prohibited at least 25 feet from the end of an intersection curb return to provide sight distance at street crossings.

Street Connectivity

Street connectivity is important because a well-connected street system provides more capacity than a disconnected one, provides alternate routes for local traffic, and is more pedestrian and bicycle-friendly. It is likely that Baker City's relative lack of congestion is in part due to its grid system. Ensuring that this grid is extended as development occurs is critical to Baker City's continued livability. To this end, a maximum block perimeter of 1600 feet is recommended.

RECOMMENDED RURAL STREET STANDARDS

Rural Local Streets

Generally, the average weekday traffic volume on a rural local residential street averages less than 500 vehicles per day, and design speeds are 25 MPH. The recommended standard for a rural local residential street is a 24 to 36-foot roadway within a 60-foot right-of-way, as shown on Figure 7-2, Section A. The width of the roadway and right-of-way is determined by the width of the shoulder, assuming two 10-foot travel lanes as a constant.

The narrower streets and travel lanes generally improve the neighborhood aesthetics, and discourage speeding. They also reduce right-of-way needs, construction cost, storm water run-off, and vegetation clearance. The width of the shoulder is determined by anticipated traffic volumes, as shown in the table in Figure 7-2. It is expected that on rural local streets, parking will be off-pavement.

For the most part, rural streets will not include sidewalks. Pedestrians are generally accommodated on the shoulder of the road, as are bicyclists. However, in areas with high pedestrian or bicycle use, a pathway should be considered, preferably located on both sides of the roadway, separated from the roadway by at least five feet of greenbelt or drainage ditch.

Rural Collector Streets

Collector streets are primarily intended to serve abutting lands and local access needs of neighborhoods. They are intended to carry between 1,200 and 10,000 vehicles per day. Collectors can serve residential, commercial, industrial, and mixed land uses. Figure 7-2, Section B shows a cross section with a 60-foot right-of-way and a 32 to 40-foot paved width. This width allows two twelve-foot travel lanes and four- to eight-foot shoulders. The width of the roadway and right-of-way is determined by the width of the shoulder. The width of the shoulder is determined by anticipated traffic volumes, as shown in the table in Figure 7-2. It is expected that on rural collector streets, parking will be off-pavement.

For the most part, rural collectors will not include sidewalks. Pedestrians are generally accommodated on the shoulder of the road, as are bicyclists. However, in areas with high pedestrian or bicycle use, a pathway should be considered, preferably located on both sides of the roadway, separated from the roadway by at least five feet of greenbelt or drainage ditch.

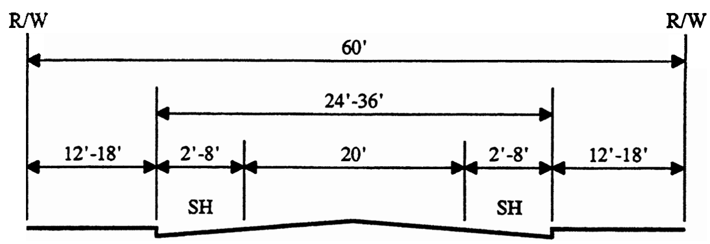
If traffic volume forecasts exceed 5,000 vehicles per day, then driveways serving single family houses, duplexes, or triplexes should not be permitted on that section.

DAVID EVANS & ASSOCIATES, INC.

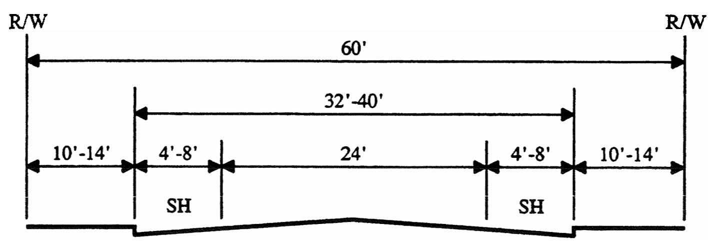
LEGEND

SH = SHOULDER
R/W = RIGHT-OF-WAY LINE

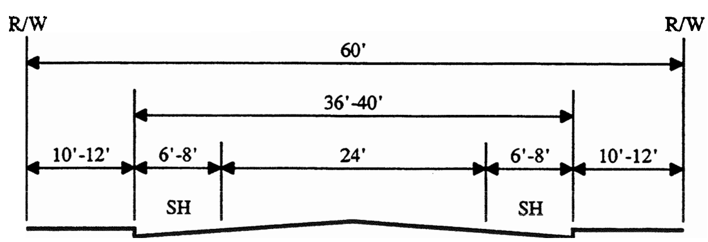
A. RURAL LOCAL STREET



B. RURAL COLLECTOR STREET



C. RURAL ARTERIAL STREET



Shoulder Width	ADT < 400	ADT > 400 DHV < 100	DHV 100-200	DHV 200-400	DHV > 400
Rural Local Street		2 feet	4 feet	6 feet	8 feet
Rural Collector Street	2 feet	4 feet	6 feet	8 feet	8 feet
Rural Arterial Street	4 feet	6 feet	6 feet	8 feet	8 feet

Note: DHV (Design Hour Volume) is the expected traffic volume in the peak design hour (usually a commuter time), usually 13 to 25% of ADT.

FIGURE 7-2
RURAL STREET DESIGN STANDARDS

Rural Arterial Streets

Arterial streets form the primary roadway network within and through a region. They provide a continuous roadway system which distributes traffic between different neighborhoods and districts. Generally, arterial streets are high capacity roadways which carry high traffic volumes with minimal localized activity. Residential property should not face or be provided with access onto arterial streets.

Figure 7-2, Section C shows a cross section with a 60 to 64-foot right-of-way and a 36 to 40-foot paved width. This width allows two 12-foot travel lanes and six to eight-foot shoulders. The width of the roadway and right-of-way is determined by the width of the shoulder. The width of the shoulder is determined by anticipated traffic volumes, as shown in the table in Figure 7-2. No on-street parking should be allowed on arterial streets.

For the most part, rural arterial streets will not include sidewalks. Pedestrians are generally accommodated on the shoulder of the road, as are bicyclists. However, in areas with high pedestrian or bicycle use, a pathway should be considered, preferably located on both sides of the roadway, separated from the roadway by at least five feet of greenbelt or drainage ditch.

ACCESS MANAGEMENT

Access management is an important tool for maintaining a transportation system. The lack of a prudent access management plan can result in excessive numbers of access points along arterial streets. Too many access points can diminish the function of an arterial, mainly due to delays and safety hazards created by turning movements. Traditionally, the response to this situation is to add lanes to the street. However, this can lead to increases in traffic and, in a cyclical fashion, require increasingly expensive capital investments to continue to expand the roadway.

Reducing capital expenditures is not the only argument for access management. Additional driveways along arterial streets lead to an increased number of potential conflict points between vehicles entering and exiting the driveway, and through vehicles on the arterial streets. This not only leads to increased vehicle delay and a deterioration in the level of service on the arterial, but also leads to a reduction in safety.

Research has shown a direct correlation between the number of access points and collision rates. In addition, the wider arterial streets that can ultimately result from poor access management can diminish the livability of a community. Therefore, it is essential that all levels of government maintain the efficiency of existing arterial streets through better access management.

Access Management Techniques

The number of access points to an arterial can be restricted through the following techniques:

- Restricting spacing between access points (driveways) based on the type of development and the speed along the arterial
- Sharing of access points between adjacent properties
- Providing access via collector or local streets where possible

- Constructing frontage roads to separate local traffic from through traffic
- Providing service drives to prevent spill-over of vehicle queues onto the adjoining roadways
- Providing acceleration, deceleration, and right turn only lanes
- Offsetting driveways to produce T-intersections to minimize the number of conflict points between traffic using the driveways and through traffic
- Installing median barriers to control conflicts associated with left turn movements
- Installing side barriers to the property along the arterial to restrict access width to a minimum

Access management is hierarchical, ranging from complete access control on freeways to increasing use of streets for access purposes, parking and loading at the local and minor collector level. Table 7-2 describes recommended general access management guidelines by roadway functional classification.

Table 7-2
Recommended Access Management Standards

Functional Classification	Intersections: Public Road Type(1)	Intersections: Public Road Spacing	Intersections: Private Drive(2) Type	Intersections: Private Drive(2) Spacing	Signal Spacing(3)	Median Control(4)
Urban Arterial	at-grade	¼ mile	L/R Turns	300-500'	½ mile	Partial/None
Urban Collector	at-grade	500'	L/R Turns	100'	¼-½ mile	None
Urban Local Street	at-grade	200-400'	L/R Turns	Access to Each Lot	N/A	None
Downtown Commercial	at-grade	200-400'	L/R Turns	100'	400'	None
Alley (Urban)	at-grade	200-400'	L/R Turns	Access to Each Lot	N/A	None

(1) For most roadways, at-grade crossings are appropriate.

(2) Generally, no signals are allowed at private access points on statewide and regional highways. If warrants are met, alternatives to signals include median closing. Allowed moves and spacing requirements may be more restrictive than those shown to optimize capacity and safety. Any access to a State Highway requires a permit from the ODOT District Office. Access will generally not be granted where there is a reasonable alternative access.

(3) Generally, signals should be spaced to minimize delay and disruptions to through traffic. Signals may be spaced at intervals closer than those shown to optimize capacity and safety. Pedestrian crossing is often benefited by a closer intervals of signal placing.

(4) Partial median control allows well-defined and channelized breaks in the physical median barrier between intersections. Use of physical median barriers can be interspersed with segments of continuous left-turn lane, or, if demand is light, no median at all. Medians can be beneficial to crossing pedestrians.

These access management restrictions are generally not intended to eliminate existing intersections or driveways. Rather, they should be applied as new development occurs. Over time, as land is developed and redeveloped, the access to roadways will meet these guidelines. However, where there is a recognized problem, such as an unusual number of collisions, these techniques and standards can applied to retrofit existing roadways.

To summarize, access management strategies consist of managing the number of access points and providing traffic and facility improvements. The solution is a balanced, comprehensive program that provides reasonable access while maintaining the safety and efficiency of traffic movement.

Special Access Management Areas in Baker City

Access management is important to promoting safe and efficient travel for both local and long distance users along State Highways 7 and 30 in Baker City. The 1991 *Oregon Highway Plan* specifies an access management classification system for State facilities. Although Baker County and Baker City may designate State highways as arterial roadways within their transportation systems, the access management categories for these facilities should generally follow the guidelines of the Oregon Highway Plan. This section of the Transportation System Plan describes the state highway access categories and specific roadway segments where special access areas may apply.

Highways 7 and 30 through Baker City are State highways. Within Baker City's UGB, Oregon Highway Plan Category 4, "Limited Control" applies. This classification permits at-grade intersections or interchanges at a minimum spacing of one-quarter mile. Private driveways should have a minimum spacing of 500 feet from each other and from intersections. **Traffic signals are permitted at a minimum of one-half mile spacing.** These requirements are similar to the general access management guidelines specified for major arterial roadways.

However, while these access management guidelines can be applied to some portions of Highways 7 and 30, the City has a grid system through the downtown area, with intersections spaced as closely as 400 foot apart. Neither the general access category for major arterial roadways nor the OHP Category 4 classification can be met on these sections of the roadways.

Indeed, the Highway standards are too restrictive for areas with centralized commercial development, such as downtown Baker City. Shorter block lengths and a well-developed grid system are important to a downtown area, along with convenient and safe pedestrian facilities. Downtown commercial arterial streets typically have blocks 200-400 feet long, driveway access sometimes as close as 100-foot intervals, and, occasionally, signals may be spaced as close as every 400 feet. The streets in downtown areas must have sidewalks and crosswalks, along with on-street parking. The need to maintain these typical downtown characteristics must be carefully considered along with the need to maintain the safe and efficient movement of through traffic.

Therefore, Highways 7 and 30 have been separated into two segments for the purposes of this plan, as shown in Table 7-3.

Table 7-3
Special Access Management Guidelines

Standard	Segment 1	Segment 2
Posted Speed (mph)	15-25	35-40
Spacing Between Driveways	150 feet	500 feet
Spacing Between Intersections	300 feet	¼ mile
Area of Application	• Hwy 7, Auburn St to Campbell St • Hwy 30, Auburn St to Campbell St	• Hwy 7, south of Auburn St to S. UGB • Hwy 7 at Campbell St to E. UGB • Hwy 30, south of Auburn St to S. UGB • Hwy 30, north of Campbell St to N. UGB

MODAL PLANS

The Baker City modal plans have been formulated using information collected and analyzed through a physical inventory, forecasts, goals and objectives, and input from area residents. The plans consider transportation system needs for Baker City during the next 20 years assuming the growth projections discussed in Chapter 5. The timing for individual improvements will be guided by the changes in land use patterns and growth of the population in future years. Adjustment to specific projects and improvement schedules will likely need to be adjusted depending on where growth occurs within Baker City.

Seven modal plans are described in the following text. These are: 1) Pedestrian System, 2) Bicycle System, 3) Street System, 4) Transportation Demand Management Plan, 5) Public Transportation Plan, 5) Rail Service, 6) Air Service, and 7) Pipeline Service. (Baker City has no water-based transportation.) All of these plans closely interrelate; for example, the street system plan, although primarily designed around the motor vehicle traffic forecasts, will also serve pedestrians, bicyclists, and transit users. In addition, all modes will be served by the implementation of revised zoning ordinances and development codes supporting mixed land uses and higher density, as described in Chapter 9.

Each modal plan also includes an implementation schedule and budgetary cost estimate. The funding strategy recommended for the Transportation System Plan is discussed in detail in Chapter 8.

Pedestrian System Plan

A complete pedestrian system should be implemented in the City. Every paved street shall have sidewalks on both sides of the roadway meeting the requirements set forth in the street standards. Pedestrian access on walkways shall be provided between all buildings including shopping centers and abutting streets and adjacent neighborhoods. (Ordinances specifying these requirements are included in Chapter 9.)

A sidewalk inventory completed in 1994 by the City reveals that the downtown core of Baker City has fairly good sidewalk coverage, with the majority of the corners having curb cuts. However, many of the existing roadways outside of the downtown area do not have sidewalks, or sidewalks are segmented and curb cuts are lacking.

Sidewalks will be added as new streets are constructed and existing streets reconstructed. The implementation program identifies an approximate schedule for these improvements.

Table 7-4 contains a list of specific pedestrian improvements that will be needed over the next 20 years. (Figure 7-3 also shows these projects.)

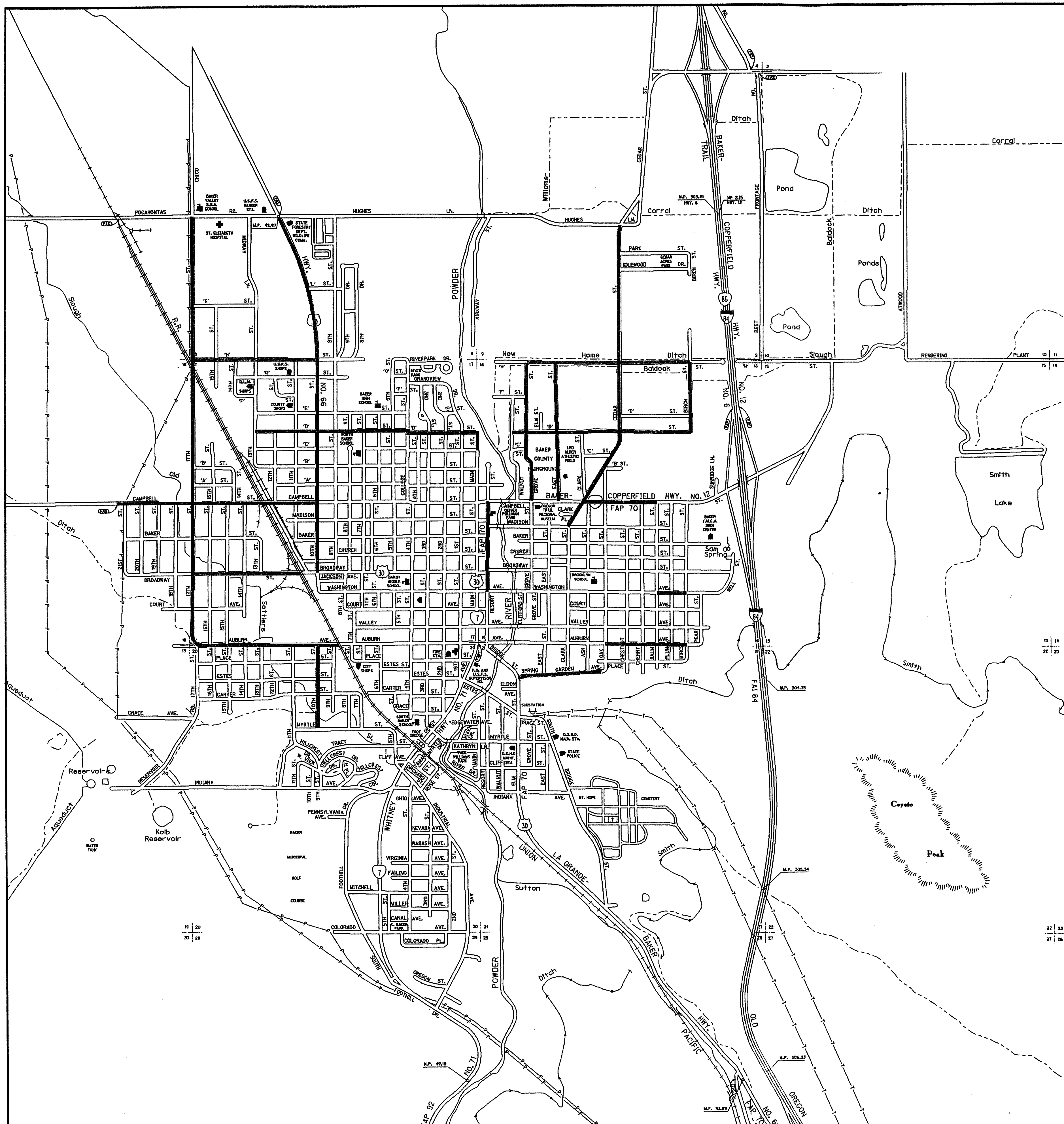
Table 7-4
Recommended Sidewalk Projects for Baker City

Location	Project	Priority	Length (ft)	Cost ($K)
10th St	Broadway Ave to D St	High	2640	$185
17th St	B St to Auburn Ave	High	3450	$241
Auburn Ave	17th St to RR	High	1256	$176
Auburn Ave	Oak St to Birch St	High	1520	$106
Broadway Ave	17th St to RR	High	2123	$148
Campbell St	Ash St to Balm St (north side)	High	1000	$70
Campbell St	Curb Extensions and Median Islands	High	NA	$54
Cedar St	Madison St to H St	High	3360	$235
D St	13th St to Main St	High	4160	$291
D St	Walnut St to Birch St	High	3360	$235
Grove St	Campbell St to H St	High	2640	$185
H St	17th St to 10th St	High	2214	$154
Resort St	Campbell St to Broadway Ave (west side)	High	1280	$45
Washington Ave	Balm St to Birch St	High	560	$40
10th St	Auburn Ave to Myrtle St	Medium	1600	$112
10th St	D St to Hughes Ln	Medium	4080	$285
Campbell St	W City limits to 10th St	Medium	3700	$258
East St	Campbell St to H St	Medium	2640	$185
H St	Grove St to Birch St	Medium	3120	$218
Main St	C St to D St	Medium	320	$22
Spring Garden Ave	Bridge St to Oak St	Medium	1760	$123
17th St	B St to Pocahontas St	Low	4640	$325
Birch St	D St to H St	Low	1280	$90
Cedar St	H St to Hughes Ln	Low	2480	$174
Subtotal High Priority Projects				$2,165
Subtotal Medium Priority Projects				$1,203
Subtotal Low Priority Projects				$589
TOTAL COST				$3,957

Note: Pedestrian projects include sidewalks on both sides unless otherwise noted.

DAVID EVANS AND ASSOCIATES, INC.

NOT TO SCALE



LEGEND

PEDESTRIAN PROJECT

FIGURE 7-3
RECOMMENDED PEDESTRIAN PROJECTS

The pedestrian improvements only include sidewalk projects. Although shoulder additions serve pedestrians, they are not ideal because they are not separated from the roadway; however, in rural areas where development may not occur quickly, the addition of shoulders is often the most practical improvement that can be implemented. Generally, shoulders are more of a benefit to cyclists than to pedestrians; therefore, proposed shoulder-widening or additions are discussed in the Bicycle System Plan section of this chapter.

A six-foot wide sidewalk with curbs already in place costs about $30 per linear foot. Adding a curb as well as a six-foot wide sidewalk costs about $35 per linear foot. In commercial areas, an eight-foot wide sidewalk with a curb would cost about $45 per linear foot. Applying these costs to a typical block in Baker City would require about 300 linear feet of sidewalk (2 x 150 ft). For a six-foot wide sidewalk including curbs, the cost would be approximately $10,500. With curbs already in place, the cost would be approximately $9,000.

Other streets: Missing sidewalk segments should be infilled whenever an opportunity presents itself (such as infill development, special grants, etc.), concentrating on arterial streets, collectors, and school routes.

Intersections: Campbell St. has been identified as a major crossing problem area for pedestrians, particularly at Geiser Pollman Park. It is recommended that a median island or curb extensions be installed at the Park as well as at other crosswalks on Campbell to shorten crossing distances, slow excessive traffic speeds, and increase pedestrian confidence.

Bicycle System Plan

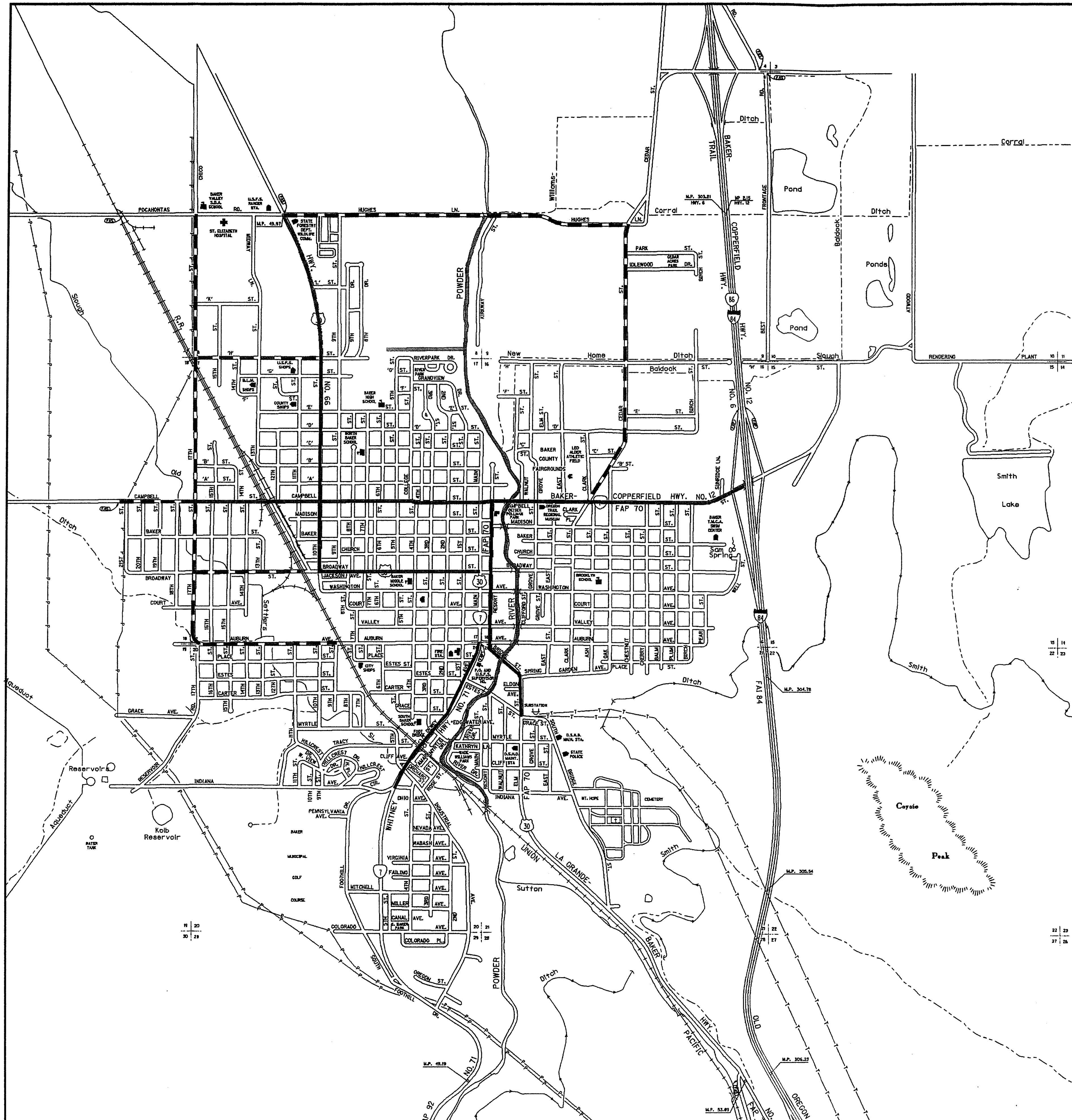
The recommended bikeway system plan is shown on Figure 7-4. The map shows the existing bikeway system, future bikeways planned by Baker City, future bikeways associated with the street system improvements, and the future city bikeways designated on all arterial and collector streets. A list of recommended bikeway improvements is shown in Table 7-5.

In addition to the projects proposed in Table 7-5, the new collectors and arterial streets recommended as part of the Street System Plan will include bike lanes.

Bike lanes should be one-way, five or six feet wide and located adjacent to the curb, except where there is curb parking or a right-turn lane. Where these conditions occur, the bike lane is located between the through travel lane and the parking or right-turn lane. The bike lane is marked in the same direction as the adjacent travel lane. Striping and signing should conform with the State Bicycle and Pedestrian Plan.

Shared roadway facilities are appropriate for local residential streets where speeds and volumes of motor vehicles are relatively low. On a shared roadway facility, bicyclists share normal vehicle lanes with motorists.

The proposed projects: In general, the more urban portions of Baker City are bicycle-friendly. This is because the streets are wide and traffic is relatively light. However, bicycle use in Baker City is surprisingly low in light of its favorable climate, well-connected street grid, closely spaced land use pattern, and flat topography. In addition, some of the more rural streets are too narrow to adequately serve cyclists. These rural streets are usually lacking sidewalks, so pedestrians must share the narrow shoulder with cyclists, a less than optimal situation.



NOT TO SCALE

DAVID EVANS AND ASSOCIATES, INC.

LEGEND

- BIKE LANE PROJECTS
- SHOULDER PROJECTS
- SEPARATED PATH

FIGURE 7-4

RECOMMENDED BIKEWAY PROJECTS

Table 7-5
Recommended Bikeway Projects for Baker City

Location	Project	Length/Width	Priority	Cost (K)
10th St (US 30)	Hughes Ln to Broadway Ave: restripe to 3 lanes (7P-6B-12-14-12-6B-7P); or remove parking on one side (7P-5B-11.5-12-12-11.5-5B); or remove parking from both sides (6B-12-14-14-12-6B)	6870/64-66 ft	High	$12
Broadway Ave (US 30)	10th to Main St: restripe to 3 lanes (7P-6B-12-14-12-6B-7P); or remove parking on one side (7P-5B-11.5-12-12-11.5-5B); or remove parking on both sides (6B-12-14-14-12-6B)	2990/64-66 ft	High	$6
Campbell St (OR 7)	Main St to I-84: restripe to 3 lanes (7P-6B-12-14-12-6B-7P)	5400/64 ft	High	$11
Campbell St	17th St to Main St: restripe with bike lanes (7P-5B-11-11-6B or 5B-10-10-10-5B)	5115/40 ft	High	$6
Hughes Lane	Hwy 30 to Cedar Rd. Widen to 32 ft with 11-ft lanes and 5-ft shoulders (5-11-11-5)	6600/24ft	High	$150
Resort St	Campbell St to Bridge St: add 6-ft bike lanes	2654/24 ft	High	$2
Leo Adler Pathway	Separated Path (Powder River)	Approx 10560/10-12ft	High	$232 (1)
High School Pathway	Separated Path - Spur from Leo Adler Pathway	Approx 1520/10-12 ft	High	$26
17th St	Pocahontas Rd to B St: widen to 32 ft with 11-ft lanes and 5-ft shoulders (5-11-11-5)	4549/26 ft	Medium	$82
17th St	B St to Auburn Ave: widen to 32 ft with 11-ft lanes and 5-ft shoulders (5-11-11-5)	3450/24 ft	Medium	$83
Auburn Ave	17th St. to RR: widen to 32 ft with 11-ft lanes and 5-ft shoulders (5-11-11-5)* (2)	2516/24 ft	Medium	$60
Broadway Ave	17th St to RR: widen to 32 ft with 11-ft lanes and 5-ft shoulders (5-11-11-5)*	2123/24 ft	Medium	$50
Cedar St	Hughes Ln to Campbell St: Add 5-ft shoulder to east side	5372/24 ft	Medium	$65
Dewey Ave (OR 7)	Auburn Ave to S Foothill Dr: restripe to add bike lanes (7P-5B-10-10-5B-7P); or remove parking on one side (8P-6B-12-12-6B)	7060/44 ft	Medium	$12
Bridge St (US 30)	Auburn Ave to Elm St: restripe to add bike lanes (7P-5B-10-10-5B-7P); or remove parking on one side (8P-6B-12-12-6B)	1000/44 ft	Low	$3
Campbell St	W City Limits to 17th St: widen to 32 ft with 11-ft lanes and 5-ft shoulders (5-11-11-5)*	1380/24 ft	Low	$33
Elm St (US 30)	Bridge St to S. Bridge St: restripe to add bike lanes (7P-5B-10-10-5B-7P); or remove parking on one side (8P-6B-12-12-6B)	5020/44 ft	Low	$9
H St	17th St to 10th St: widen to 32 ft with 11-ft lanes with 5-ft shoulders (5-11-11-5)*	2214/24 ft	Low	$53
Subtotal High Priority				$445
Subtotal Medium Priority				$352
Subtotal Low Priority				$98
TOTAL COST				$895

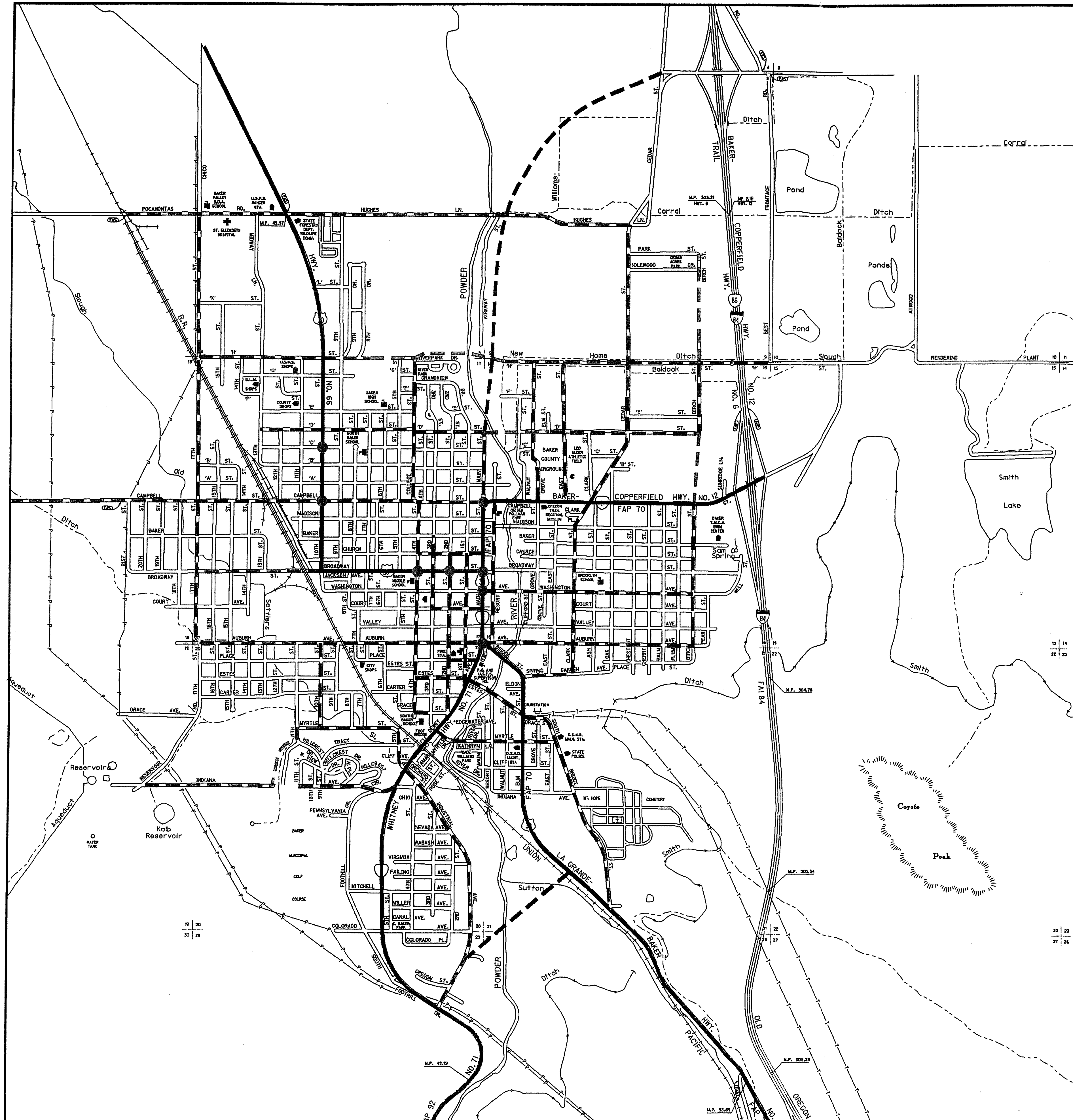
(1) Costs do not include right-of-way acquisition

(2) Shoulders should be considered interim projects for these segments, since sidewalks are also recommended (see Table 7-4). If sidewalks are installed at the same time as bike lanes are added, the roadway should be improved to full standard width with 6-ft bike lanes.

B=Bike Lane

P= Parking Lane

Therefore, a number of the projects presented in Table 7-5 are shoulder additions that will serve bicyclists as well as pedestrians as an interim facility. Shoulders are sufficient for bicyclists, particularly in rural areas where traffic volumes are lighter. Shoulders improve the road function for all users and are relatively



NOT TO SCALE

LEGEND

- EXISTING ARTERIAL
- EXISTING COLLECTOR
- TRAFFIC SIGNAL
- FUTURE ROADWAY WITHIN NEXT 20 YEARS
- BEYOND 20-YEAR PLANNING HORIZON

DAVID EVANS AND ASSOCIATES, INC.

FIGURE 7-5
RECOMMENDED ARTERIAL AND COLLECTOR STREET SYSTEM

inexpensive. However, as land use densities and traffic increases over the long-term, the best solution for all users is to reconstruct the street to full standards with sidewalks and bike lanes.

In addition, Baker City has proposed a separated pathway along the Powder River. The final routing has not been finalized.

Other streets: monitor traffic volumes and install bike lanes when ADT reaches 3,000–5,000 range; for most streets, this would require reducing travel lane widths (to 10–11 ft) or removing parking on one or both sides as necessary (e.g., 40 ft restriped as 7P-5B-11-11-6B or 42 ft restriped as 7P-4B-10-10-4B-7P). Key streets in the 'other' category that should remain bicycle friendly as traffic increases are 4th St., Auburn Ave., and Washington Ave.

Although Main St (US 30/OR 7) from Broadway Ave to Campbell St is 64-66 ft wide and could accommodate bike lanes by removing a travel lane or on-street parking, this street is the core of the downtown area and should retain its present features. Bicyclists will share this street more easily than some others because of its slow traffic speeds. As discussed in the Pedestrian System Plan section, the addition of curb extensions and more strongly marked crosswalks will further calm traffic movements and make it more comfortable for cyclists.

Intersections: Where there is significant traffic (more than 6,000–10,000 ADT in all directions) or turn lanes at intersections, through and turning bike lanes should be considered. In addition, signal timing should be adjusted to provide minimum wait times (less than 30 seconds).

Railroad Crossings: Railroad crossings are typically rough throughout Baker City, with asphalt pulling away from the rails presenting a hazard to narrow wheels such as those on wheelchairs or bicycles. A joint agreement with Union Pacific Railroad should be pursued to provide concrete rail approaches on Auburn Ave., Campbell, Broadway, and 17th streets, and Hughes Lane.

Bicycle Parking: Bicycle parking is generally lacking in Baker City. Bike racks should be installed in front of downtown businesses and all public facilities (schools, post office, library, city hall, and parks). Typical rack designs cost about $50 per bike plus installation. An annual budget of approximately $1,500 to $2,000 should be established so that Baker City can begin to place racks where needs are identified and to respond to requests for racks at specific locations. Bicycle parking requirements are further addressed in Chapter 9 (Policies and Ordinances).

Street System Plan

The street system plan outlines a series of improvement options that are recommended for construction within the Baker City area during the next 20 years. The street system plan was developed by applying recommended street classification standards to the year 2015 traffic forecasts for the recommended street system. These options have been discussed in Chapter 6 (Improvement Options Analysis). The proposed street system plan is summarized in Table 7-6 and shown in Figure 7-5. Projects which should occur within the next 20 years, and potential projects which may occur beyond the 20-year planning horizon are all shown in Figure 7-5.

Table 7-6
Recommended Street System Projects for Baker City

Location	Project	Priority	Cost ($K)
Birch St	Connection between Idlewood Dr and H St	High	$200
Campbell St	I-84 to Main Street Restriping to 3 Lanes	High	$10
Indiana Ave	New Connection between Indiana Ave and Hillcrest Dr and Closure between 11th St and New Connection	High	$444
Birch St	Connection between D St and Campbell St	Medium	$550
D St	Connection between Main St and Walnut St and Grove St and Elm St	Medium	$1,600
H St	Connection between Stub east of Powder River and Stub near 8th St	Low	$2,500
H St	Connection over I-84 between Best Frontage Road and Stub west of I-84	Beyond 20-years	$2,900
Main St	Extension to Exit 306 on I-84 and Highway 86	Beyond 20-years	$4,600
Southeast Connector	Connection between Highways 7 and 30 in the Southeast Quadrant	Beyond 20-years	$3,400
Subtotal High Priority Projects			$654
Subtotal Medium Priority Projects			$2,150
Subtotal Low Priority Projects			$2,500
Beyond 20-years			$10,900
TOTAL COST			$16,204

Note: These projects include sidewalks and bike lanes with construction or reconstruction of roadway segments.

Transportation Demand Management Plan

Through transportation demand management, peak travel demands could be reduced or spread to more efficiently use the transportation system, rather than building new or wider roadways. Techniques which have been successful and could be initiated to help alleviate some traffic congestion include carpooling and vanpooling, alternative work schedules, bicycle and pedestrian facilities, and programs focused on high density employment areas.

Alternative Work Schedules

Alternative work schedules (such as flex-time or staggered work hours), especially with large employers, can help spread the peak period traffic volumes over a longer time period, thus providing greater service out of a fixed capacity roadway. Staggered work schedules shall be encouraged with new industries and be coordinated to eliminate high surges of traffic.

Carpooling and Vanpooling

Baker City can establish a ridesharing program to encourage carpooling. The service allows interested drivers to call a toll-free number, provide information about their trip, and receive a list of others in their general area.

The City can work with large employers, to establish a carpool and vanpool program. These programs, especially oriented to workers living in other neighboring City, will help to reduce the travel and parking requirements, and to reduce air pollution. Employers can encourage ridesharing by providing matching services subsidizing vanpools, establishing preferential car and vanpool parking and convenient drop-off sites, and through other promotional incentives.

Bicycle/Pedestrian Facilities

Bicycling and walking can be encouraged by implementing strategies discussed earlier in this plan. Providing bicycle parking, showers and locker facilities helps to encourage bicycle commuting and walking to work.

Telecommuting

The ability for people to work at home with the telecommuting technology is likely to continue to grow during the next two decades. During the past ten years, the percent of people working at home has more than doubled. If this trend continues, an additional 3 percent of the work force could stay home and work, thus reducing trips during the peak hour.

No costs have been estimated for this modal plan. Grants may be available to set up programs; other aspects Transportation Demand Management can be encouraged through ordinance and policy.

Public Transportation Plan

Public transportation in Baker City consists of taxicabs and a demand responsive system for local trips, van shuttle for trips to nearby communities, and Greyhound bus line service for long distance trips. No specific expansions of any of these services is currently planned by any of the transit providers; however, increased usage of these services should be encouraged.

The existing public transportation services already meet the requirements of the Oregon Transportation Plan. Connections are possible and convenient between all the services provided, and the service frequency meets the required daily trip to a larger city specified for communities the size of Baker City. However, growth should be guided so that it does not prevent transit development in the future.

No costs have been estimated for this modal plan. Grants may be available to conduct feasibility studies. State and Federal funding may be available to purchase equipment.

Rail Service Plan

Amtrak provides passenger rail service, and Union Pacific provides freight service. No plans are known to alter these services to Baker City. Efforts should be made by the City to retain or expand its rail service.

Air Service Plan

The Baker County Airport is located to the northeast of Baker City, outside the city's UGB. There are no commercial flights to the airport at this time; however, efforts to solicit air service are ongoing.

Pipeline Service Plan

The nearest pipelines to Baker City are the Pacific Gas Transmission natural gas pipeline and the Chevron Pipeline Company's petroleum products pipeline that skirt the western edge of the City limits.

TRANSPORTATION SYSTEM PLAN IMPLEMENTATION PROGRAM

Implementation of the Baker City Transportation System Plan will require both changes to the City comprehensive plan and zoning code and preparation of a 20-Year Capital Improvement Plan. These actions will enable Baker City to address both existing and emerging transportation issues throughout the urban area in a timely and cost effective manner. This implementation program is geared towards providing Baker City with the tools to amend the comprehensive plan and zoning ordinance to conform with the Oregon Transportation Planning Rule and to fund and schedule transportation system improvements.

Model policy and ordinance language that conforms with the requirements of the Transportation Planning Rule has been provided to Baker City under separate cover. In addition, a list of proposed zoning code ordinance amendments are included that will enable Baker City to revise the zoning code to encourage mixed-uses within the urban area. The intent is to encourage compatible uses that reduce reliance on use of automobiles. The proposed zoning code amendments will encourage greater densities and better use of existing land within the UGB that is already served by local streets and public utilities such as sewer and water. The proposed ordinance amendments will require approval by the City Council and those that affect the unincorporated urban area will also require approval by the Board of County Commissioners.

The second part of the implementation program is the formulation of a 20-Year Capital Improvement Plan (CIP). The purpose of the CIP is to detail what transportation system improvements will be needed as Baker City grows and provide a process to fund and schedule the identified transportation system improvements. It is expected that the Transportation System Plan Capital Improvement Plan can be integrated into the existing City CIP, Baker County Road Plan, and the ODOT STIP. This integration is important since the Transportation System Plan proposes that all three governmental agencies will fund some of the transportation improvement projects.

Table 7-7 summarizes the Baker City Transportation System Plan Capital Improvement Program. It lists the projects by type, prioritizes them, and provides cost information. The cost estimates for all the project listed on the CIP were prepared on the basis of 1995 dollars. These costs include design, construction, Right-of-Way acquisition, and contingencies where appropriate. The highway and street cost estimates are preliminary by road segment and do not include the cost of adding or relocating public utilities or detailed design of existing street intersections.

The entire 20-year Capital Improvement Program is estimated to cost approximately $20.7 million. The Transportation System Plan Funding chapter details how the transportation system improvements can be funded during the next 20 years.

DEA INC.

Table 7-7
Prioritized Capital Improvement Program (1995) Dollars

Project Description	Local Cost ($)	State Cost ($)	Total Cost ($)
HIGH PRIORITY			
Street System Projects			
Birch St. Connection between Idlewood Dr and H St	200,000		200,000
Campbell St - I84 to Main St restriping to 3 lanes		10,000	10,000
Indiana Ave - New connection and unsafe section closure	444,000		444,000
Pedestrian Projects			
10th St - Broadway Ave to D St		185,000	185,000
17th St. - B St to Auburn Ave	241,000		241,000
Auburn Ave - 17th St to RR	176,000		176,000
Auburn Ave - Oak St to Birch St	106,000		106,000
Broadway Ave - 17th St to RR	148,000		148,000
Campbell St - Ash St to Balm St (north side)		70,000	70,000
Campbell St - curb extension and median islands		54,000	54,000
Cedar St- Madison St to H St	235,000		235,000
D St - 13th St to Main St	291,000		291,000
D St - Walnut St to Birch St	235,000		235,000
Grove St - Campbell St to H St	185,000		185,000
H St - 17th St to 10th St	154,000		154,000
Resort St - Campbell St to Broadway Ave (west side)	45,000		45,000
Washington Ave - Balm St to Birch St	40,000		40,000
Bikeway Projects			
10th St - Hughes Ln to Broadway Ave		12,000	12,000
Broadway Ave - 10th St to Main St		6,000	6,000
Campbell St - Main St to I-84		11,000	11,000
Campbell St - 17th St to Main St	6,000		6,000
Hughes Ln - Hwy 30 to Cedar Rd	150,000		150,000
Resort St - Campbell St to Bridge St	2,000		2,000
Leo Adler Pathway - Separated Path along Powder River	232,000		232,000
High School Pathway - Spur from Leo Adler Pathway	26,000		26,000
MEDIUM PRIORITY			
Street System Projects			
Birch St - Connection between D St and Campbell St	550,000		550,000
D St - Connections between Main St and Elm St	1,600,000		1,600,000
Pedestrian Projects			
10th St - Auburn Ave to Myrtle St	112,000		112,000
10th St - D St to Hughes Lane	285,000		285,000
Campbell St - W City Limits to 10th St	258,000		258,000
East St - Campbell St to H St	185,000		185,000
H St - Grove St to Birch St	218,000		218,000
Main St - C St to D St	22,000		22,000
Spring Garden Ave - Bridge St to Oak St	123,000		123,000
Bikeway Projects			
17th St - Pocahontas Rd to B St	82,000		82,000
17th St - B St to Auburn Ave	83,000		83,000
Auburn Ave - 17th St to RR	60,000		60,000
Broadway Ave - 17th St to RR	50,000		50,000
Cedar St - Hughes Lane to Campbell St	65,000		65,000
Dewey Ave - Auburn Ave to S Foothill Drive		12,000	12,000

DEA INC.

Table 7-7
Prioritized Capital Improvement Program (1995) Dollars
Continued

LOW PRIORITY			
Street System Projects			
H St - Connection between stub east of Powder River and stub near 8th St	2,500,000		2,500,000
Pedestrian Projects			
17th St - B St to Pocahontas St	325,000		325,000
Birch St - D St to H St	90,000		90,000
Cedar St - H St to Hughes Lane	174,000		174,000
Bikeway Projects			
Bridge St - Auburn Ave to Elm St		3,000	3,000
Campbell St - W City Limits to 17th St	33,000		33,000
Elm St - Bridge St to S Bridge St		9,000	9,000
H Street - 17th St to 10 St	53,000		53,000
Subtotal High Priority - Short Term (0-5 years)	**2,916,000**	**348,000**	**3,264,000**
Subtotal Medium Priority - Mid Term (6-10 years)	**3,693,000**	**12,000**	**3,705,000**
Subtotal Low Priority - Long Term (11-20 years)	**3,175,000**	**12,000**	**3,187,000**
Total	**9,784,000**	**372,000**	**10,156,000**

CHAPTER 8: FUNDING OPTIONS AND FINANCIAL PLAN

The successful implementation of the Transportation System Plan will require that Baker City work with ODOT and Baker County to secure adequate funding to finance new transportation projects during the next 20 years. The formulation of a comprehensive Capital Improvement Plan (CIP) will enable Baker City to schedule the construction and funding of new improvements that address existing capacity and safety issues and those improvements that will be needed to accommodate future population and employment throughout the urban area. This chapter provides an analysis of available funding options that can be considered by Baker City and provides a framework for a 20-year Capital Improvement Plan.

The Baker City Transportation System Plan identifies the need for approximately $10 million in funding to finance the transportation system improvements over the next 20 years. It is expected that transportation system improvements will be made to city streets, county roads, and state highways within the Baker City Urban Growth Boundary. This Transportation System Plan cost estimate only covers the costs associated with constructing new transportation system improvements and does not cover any costs associated with maintaining the current or future system. This funding analysis assumes that there will be a cost sharing of future improvements by Baker City, Baker County, and ODOT. Close coordination on scheduling and funding transportation improvements will be vital for the timely construction of the identified transportation system improvements.

Although this Transportation System Plan considers a 20 year planning horizon, the timing for specific transportation system improvements will be governed by the rate of population and employment growth within the urban area. Historically, Baker City has experienced stable to low growth. However, recently Baker City has experienced a growth spurt. If this higher growth rate continues, Baker City and ODOT may need to consider constructing Transportation System Plan improvements at an accelerated rate. If, however, the growth rate levels off to its historical levels, then it is more likely the City and ODOT will be able to schedule future transportation system improvements over the entire 20-year Transportation System Plan lifespan.

At the present time, Baker City is doing a good job of making street, pedestrian, and bicycle improvements within the City on an annual basis. Projects that are funded are typically identified in the public facilities plan and have been identified and prioritized by the Public Works Department. This yearly capital outlay funding has been successful in financing a small number of projects each year, but the success of the program is limited due to inadequate City funding and does not address needed transportation system improvements within the study area outside the city limits. In order to implement the Transportation System Plan, Baker City will need to work closely with ODOT and Baker County to increase funding for multimodal transportation projects and to consider needed improvements throughout the urban area.

This section of the Transportation System Plan discusses the various funding and financing options that may be available to Baker City to meet its 20-year transportation funding needs. Included in this chapter is a review of historical street improvement funding sources, potential new revenue sources, a review of transportation system funding requirements, and general recommendations for financing future transportation system improvements. In addition, a brief analysis of how Baker County and ODOT finance transportation system improvements is included to provide context on the ways different governmental agencies can work together in the future.

BAKER CITY STREET TRANSPORTATION RELATED REVENUES

Baker City accounts for transportation related revenues and expenditures in several separate funds. Each fund is accounted for separately in the annual fiscal year budget. These funds include:

- General Fund
- Street Tax Fund
- Equipment and Vehicle Fund
- Street Construction Fund
- State Revenue Sharing Fund
- Masonic Lodge Road Trust Fund

In addition to these funds, Baker City has historically employed Local Improvement Districts (LIDs) to fund localized transportation improvements. The City has also historically obtained a variety of state and federal transportation grants.

General Fund

The purpose of the General Fund is to provide for salaries and benefits of city workers and fund the operations of the police, fire, planning, golf and airport departments. The airport department is the only transportation related expense of the general fund. The general fund released about $26,000 per year over the last four years for the operations and maintenance of the airport. The general fund receives money from approximately 36 different sources. Some of the major sources include property taxes, franchise income and state liquor and cigarette prorations.

Street Tax Fund

The purpose of the Baker City State Street Tax Fund is to maintain and rehabilitate city streets. The fund also provides money to the Street Construction Fund. A summary of the State Street Tax Fund over the last four years is detailed in 1 and Table 8-2.

Revenues received from the State of Oregon, such as gas taxes and vehicle registration fees, will provide about 38% of the State Street Fund revenues in the 1995/1996 budget year. This is down from previous years that have had over 40% of the fund coming from these sources. The primary reason for this decline is the large beginning fund balance left over from 1994/1995. The other significant revenue source is provided by a transportation serial levy.

The Baker City State Street Fund is used for both new construction and maintenance of the local street system.

INC.

Table 8-1
City of Baker City Street Tax Fund: Historical Revenues

Description	1992/1993	1993/1994	1994/1995	1995/1996
Cash On Hand	$131,795	$227,686	$347,255	$394,712
Prior Year Tax Levy	19,210	21,996	77,814	6,636
Gas Tax	398,255	420,133	430,951	432,284
Incidental Sales	35,650	6,706	8,527	4,550
Investment Income	8,139	10,083	22,444	14,506
Serial Levy #3 Pri.	0	5	0	16,000
Serial Levy #4 Pri.	22,210	731	306	0
Power Sales Reimb.	0	0	633	692
Serial Levy #3 Interest	1,145	0	0	200
Serial Levy #4 Interest	293	96	26	0
Refunds	0	35	1,435	10
New Serial Levy	257,268	258,138	297,297	274,270
Total Revenues	**$873,965**	**945,609**	**$1,186,688**	**$1,143,860**

Table 8-2
City of Baker City Street Tax Fund: Historical Expenditures

Description	1992/1993	1993/1994	1994/1995	1995/1996
Street Maintenance	$293,095	$360,240	$469,902	$679,569
Local Improvement Districts	7,994	0	0	0
Street Maintenance Levy Reserve	228,424	174,745	132,112	365,506
Street Light Department	53,389	55,137	56,959	63,592
Snow and Ice Control	63,715	8,233	56,317	35,193
Totals	**$646,617**	**$598,355**	**$715,290**	**$1,143,860**

Street Construction Fund

The purpose of the Baker City State Construction Fund is to build new or provide major renovations to city streets. A summary of the Street Construction Fund over the last four years is detailed in Table 8-3 and Table 8-4.

Revenues received from the street fund will provide about 55% of the Street Construction Fund revenues in the 1995/1996 budget year. These figures are shown in Table 8-3. Other funding sources include State S.T.P funding and property assessments.

The Baker City Street Construction Fund is used for new construction of the local street system. Expenditures from the Street Construction Fund are shown on Table 8-4. During the current fiscal year, Baker City will dedicate a total of $628,997 of capital outlay expenditures to new street, walkway and bikeway construction within the community.

Table 8-3
Baker City Street Construction Fund: Historical Revenues

Description	1992/1993	1993/1994	1994/1995	1995/1996
Cash On Hand	$15,557	$10,040	$14,672	$45,407
Prior Year Tax Levy	22	24	0	0
Miscellaneous	805	375	50	500
Interest On Investments	1268	1754	2,632	1703
State Transportation Improvement Program	64,764	105,846	0	90,000
State Industrial Access Roads	0	0	0	57,136
Property Assessments	0	114,086	39,386	90,000
Transfer From State Tax Street Fund	0	80,300	200,000	344,251
Total Revenues	**$82,416**	**$312,425**	**$256,740**	**$628,997**

Table 8-4
Baker City Street Construction Fund: Historical Expenditures

Description	1992/1993	1993/1994	1994/1995	1995/1996
Operations	$71,376	$294,244	$3,400	$526,861
Black Bear Project	0	0	0	0
Church & D Streets	0	0	215,309	0
South Baker Access Road	0	0	0	0
Owners Sidewalk Improvements	0	0	0	15,000
Industrial Access Road	0	0	0	87,136
Totals	**$71,376**	**$294,244**	**$218,709**	**$628,997**

ALTERNATIVE REVENUE SOURCES

In order to finance future transportation system improvements within the Baker City urban area, it will be important to consider a range of alternative sources. The use of alternative revenue funding is a trend throughout Oregon as the full implementation of Measure 5 has significantly reduced property tax revenues. The alternative revenue sources covered in this chapter may not all be appropriate for Baker City or Baker County. However, a full overview is being provided to enable the City and County to consider a range of options to finance future transportation improvements during the next 20 years.

Property Taxes

Property taxes are the major revenue source for Oregon cities. Property taxes are levied through 1) tax base levies, 2) serial levies, and 3) bond levies. The most common method uses tax base levies which are continuous and are allowed to increase by 6% per annum. Serial levies are limited by amount and time they can be imposed. Bond levies are for specific projects and are limited by time based on the debt load of the local government.

The historic dependence on property taxes is changing with the passage of Ballot Measure 5 in the early 1990's. With the 1995/1996 budget year, Ballot Measure 5 will be fully implemented. In brief, Ballot Measure 5 limits the property tax rate for purposes other than payment of certain voter approved general obligation indebtedness. With full implementation in the current budget year, the tax rate for all local taxing authorities is limited to $15 per $1,000 of assessed valuation. As a group, all non-school taxing authorities are limited to $10 per $1,000 of assessed valuation. All tax base, serial and special levies are subject to the tax rate limitation. Excluded from the limitation is debt service used to retire voter approved general obligation bonds. Ballot Measure 5 requires that all non-school taxing districts property tax rate be reduced if together they exceed $10 per $1,000 per assessed valuation by County. If the non-debt tax rate exceeds the constitutional limit of $10 per $1,000 of assessed valuation, then all of the taxing districts' tax rates are reduced on a proportional basis. This proportional reduction in the taxing rate is commonly referred to as compression of the tax rate.

For the 1995/96 fiscal year, Baker City has a taxing rate of 6.1060 per thousand. Other taxing districts sharing the $10 non-school limitation include Baker County, the Library District and Vector Control. For the 1996/97 fiscal year, the Baker County taxing districts will be under compression by 0.3812 per $1,000 valuation. Tax revenue collections will be proportionally reduced for all the taxing districts during the next fiscal year.

Historically, Baker City has most commonly used property taxes (serial levies) to fund public works functions. And has also relied on State of Oregon shared revenues, Federal ISTEA Grants, and Local Improvement Districts to fund both public works maintenance and new construction. The shared revenues are derived from the local allocation of State gas tax and vehicle registration fees.

Debt Financing

There are a number of debt financing options available to the City. The use of debt to finance capital improvements must be balanced with the City's ability to make future debt service payments and to deal with the impact on its overall debt capacity and underlying credit rating. Debt financing should be viewed not as a source of funding, but as a time shifting of funds available to the City. Its use should be incorporated into the overall financing plan which may include some "pay-as-you-go" funding methods which utilize currently available revenues to meet a portion of the City's transportation needs.

While a wide variety of debt financing techniques exist, some of the primary financing tools used for transportation related projects are listed below. These include general obligation bonds, limited tax general obligation bonds, local improvement district bonds, and special tax revenue bonds.

General Obligation Bonds

General obligation bonds (GOs) are voter approved bond issues and represent the least expensive borrowing mechanism available to municipalities. GO bonds are typically supported by a separate property tax levy specifically approved for the purposes of retiring debt. The levy does not terminate until all the debt is paid off. The property tax levy is distributed equally throughout the taxing jurisdiction according to assessed value of property. General obligation debt is typically used to make public improvement projects that will benefit the entire community.

State statutes require that the general obligation indebtedness of a city not exceed three percent of the city's true cash value. Bonds issued for water, sewer, and other utility purposes are excluded from this limitation. Since general obligation bonds would be issued subsequent to voter approval, they would not be restricted to the limitations set forth in Ballot Measure 5 described earlier.

Limited Tax General Obligation Bonds

Limited tax general obligation bonds (LTGOs) are similar to general obligation bonds in that they represent an obligation of the municipality. However, a municipality's obligation is limited to its current revenue sources and is not secured by the public entity's ability to raise taxes. As a result, LTGOs do not require voter approval. However, since the LTGOs are not secured by the full taxing power of the issuer, investors typically require a higher rate of return than they would from a more secure, tax-backed general obligation issue. Since LTGOs are not voter approved, they are subject to limitations under Ballot Measure 5.

Local Improvement District Bonds

Local Improvement Districts (LIDs) may be formed to construct local improvements including street and sidewalk repairs and improvements. They are formed either through petition by the benefited property owners who seek a set of public improvements or through the legislative process of the city council. After the district is formed, public improvements may be made and the costs of those improvements distributed among the properties within the LID according to their respective benefit. The benefit is set by formula by the city council when the district is formed. Once the benefit and cost have been set, an assessment is levied against the benefiting properties. The owners of the benefited properties may pay in one up-front assessment or apply for assessment financing. In Oregon this means that the city will issue bonds and allow the property owners to pay their assessment over time. Since the security of special assessment bonds lies solely with the assessment payments, potential investors and rating agencies apply a much more rigorous credit evaluation than would they would be a general obligation issue backed by property taxes. As a result, it may be very difficult to sell special assessment bonds at reasonable rates for projects that have marginal credit quality.

Bancroft Bonds

In Oregon Statute, municipalities are allowed to issue Bancroft bonds which pledge the city's full faith and credit to the assessment bonds. As a result, the bonds become general obligations of the city but are paid with the assessments. Historically, this provided a city with the ability to pledge its full faith and credit in order to obtain a lower borrowing cost without needing to receive voter approval. However, since Bancroft bonds are not voter approved, taxes levied to pay debt service on them are subject to the limitations of Ballot Measure 5 described above. As a result, since 1991, Bancroft bonds have been unused by municipalities who were required to compress their tax rates.

One of the challenges of utilizing a local improvement district is managing the risk of prepaid assessments. Property owners typically have the option to pre-pay assessments in order to forgo paying continued interest payments. However, when the city first issues bonds it commits to meeting a specific stream of debt service payments at certain rates to investors. When a prepayment occurs, the city loses expected interest payments in future years. As a result, the city must actively invest such prepayments in order to maintain previously expected cash flows. The challenge of investing numerous small streams of prepayments can be administratively daunting. More often than not prepayments are left in low interest earning accounts. As a result, when the city is required to make debt service payments, it is forced to make up the difference of a low savings rate and the higher borrowing cost of the issue. To counter this potential difficulty, a city can structure bonds to allow for early redemption. This helps to mitigate the risks posed by prepayments. However, since the predictability of debt service streams are less sure, the investor will require a higher rate of return, thus leaving the city, and ultimately the assessed property owners, with a higher cost of borrowing.

Special Tax Revenue Bonds

Cities may issue revenue bonds based on the expected receipt of special taxes. Examples of such revenues are gas taxes, hotel-motel taxes, or system development charges. Generally speaking, the more predictable the revenue source, the easier it is to support debt financing with the revenue. These types of bonds are more complicated to issue and usually restrict the other uses of the dedicated revenues so the bond holders can be assured timely payment.

A few cities in Oregon have secured revenue bond issues with state gas taxes or other special transportation revenues. In many cases, local governments have become accustomed to using state gas tax revenues solely for maintenance needs. Using gas tax revenues to pay debt service on bonds instead of funding maintenance would require an issuer to either reduce its maintenance budget or provide some other source of funding for maintenance needs.

System Development Charges

System Development Charges (SDC) are becoming increasingly popular in funding public works infrastructure needed for new local development. Local governments have the legal authority to charge property owners and/or developers fees for improving the local public works infrastructure. The charges are most often targeted towards improving community water, sewer, or transportation systems. Cities and counties must have specific infrastructure plans in place that comply with State guidelines in order to collect SDCs.

Baker City could implement a SDC dedicated solely to transportation. The fee is collected when new building permits are issued within the corporate city limits. The City would calculate the fee based on trip generation of the proposed development. The City calculates the rate based on the assumption that a typical household will generate a given number of vehicle trips per day. Non residential use calculations are based on employee ratios for the type of business or industrial uses. The SDC fees will help fund construction and maintenance of the transportation network throughout the City.

It may be appropriate for the Baker City and Baker County to consider a transportation SDC for the unincorporated urban area around Baker City. The boundaries of the area to be included can coincide with the area covered by the Baker City Transportation System Plan. The SDCs generated from the area outside the city could be targeted towards maintaining and upgrading county roads. In order to put a SDC in place outside of Baker City, Baker County would need to adopt a SDC Ordinance with a plan showing how the fees would be calculated and how revenues would be spent in the future. In addition, Baker City and Baker County would need to amend the City/County Urban Growth Management Agreement (UGMA) to specify how SDC fees would be collected and what urban land areas would be included in the SDC zone.

State Gas Taxes

Gas Tax revenues received from the State of Oregon are used by all counties and cities to fund street and road construction and maintenance. In Oregon, the State collects gas taxes, vehicle registration fees, overweight/overheight fines and weight/mile taxes and returns a portion of the revenues to cities and counties through an allocation formula. The State retains approximately 60% while allocating 15.5% to cities and 24.5% to counties. The actual revenue share to cities is divided among all incorporated cities based on population.

Like other Oregon cities, Baker City uses their State Gas Tax allocation to fund street construction and maintenance. In recent years, this State allocation has accounted for about 45% of the total State Street Tax Fund. In the 1995/1996 budget year, Gas Tax revenues will account for 38% of the Baker City State Street Tax Fund. The Baker City Gas Tax allocation is combined with a variety of other revenues to fund both street maintenance and new construction.

The Oregon Constitution permits counties and incorporated cities to levy additional local gas taxes with the stipulation that the moneys generated from the taxes will be dedicated to street related improvements and maintenance within the jurisdiction. At present, only a few local governments (City of Woodburn, Multnomah and Washington Counties) levy a local gas tax.

Vehicle Registration Fees

The Oregon Vehicle Registration Fee is currently $30 bi-annually for regular passenger vehicles and is allocated to the State, counties and cities for road funding. Cities receive 15.57%, counties 24.38%, while the State retains 60.05%. Oregon counties are granted such authority, which would allow Baker County to impose a vehicle registration fee that covered the entire county. The Oregon Revised Statutes would allow Baker County to impose a biannual registration fee for all passenger cars licensed within the County. Although both counties and special districts have this legal authority, vehicle registration fees have not been imposed by local jurisdictions. In order for a local vehicle registration fee program to be viable in Baker County, all the incorporated cities and the county would need to formulate an agreement which would detail how the fees would be spent on future street construction and maintenance.

Local Improvement Districts

The Oregon Revised Statutes allow local governments to form Local Improvement Districts (LIDs) to construct public improvements. Several LIDs have been successfully implemented in Baker City. LIDs are most often used by cities to construct localized projects such as streets, sidewalks or bikeways. The Statutes allow formation of a district by either the city government or property owners. Cities that use LIDs are required to have a local LID ordinance that provides a process for district formation and payback provisions. Through the LID process, the cost of local improvements are generally spread out among a group of property owners along a public street or within a specified area. The cost can be allocated based on property frontage or other methods such as traffic trip generation. The types of allocation methods are only limited by the Local Improvement Ordinance. The cost of LID participation is considered an assessment against the property which is a lien equivalent to a tax lien. Individual property owners typically have the option of paying the assessment in cash or apply for assessment financing through the city. Since the passage of Ballot Measure 5, cities have most often funded local improvement districts through the sale of special assessment bonds. Although the interest rate for these special assessment bonds are higher than General Obligation (GO) bonds, they are not subject to the limitation of Ballot Measure 5.

Grants and Loans

Baker City has been very successful in obtaining a number of grants in recent years to assist with transportation related projects. Examples include the ISTEA grant being used to fund the Leo Adler Memorial Pathway, a multi-use path to be constructed along the Powder River. The majority of the grant and loan programs available today are geared towards economic development, and not specifically for construction of new streets. Typically, grant programs target areas that lack basic public works infrastructure needed to support new or expanded industrial businesses. Because of the popularity of some grant programs such as the Oregon Special Public Works Fund, the emphasis has shifted to more of a loan program. The loan programs often require an equal match from the local jurisdiction as a condition of approval. Baker City has used some loans for improvements, such as a National Historic Trust Loan.

Although Baker City should continue to pursue public works related grant programs in the future, the City should not base their long term capital improvement funding on future grants or loan programs. Rather, the City should continue to pursue federal and state grants for site specific projects to retain and attract new businesses, and to assist with area specific improvements. Two common State grant/loan programs; the ODOT Immediate Opportunity Growth and the Oregon Special Public Works Fund, are described below.

ODOT Immediate Opportunity Grant Program

ODOT administers a grant program designed to assist local and regional economic development efforts. The program is funded to a level of approximately $5,000,000 per year through state gas tax revenues. ODOT officials use the following as primary factors in determining eligible projects:

- Funding used to improve public roads
- Used for an economic development related project of regional significance

  Primary project must create primary employment

- Preference to grantee providing local funds to match grant (lesser matches may also be considered)

The maximum amount of any grant under the program is $500,000. Local governments which have received grants under the program include Washington County, Multnomah County, Douglas County, City of Hermiston, Port of St. Helens, and the City of Newport. Baker City is currently using these funds to partially fund the 23rd Street Construction Project, serving a new manufacturer in the NW Urban Growth Boundary Area.

Oregon Special Public Works Fund

The Special Public Works Fund (SPWF) program was created by the 1995 State Legislature as one of the several programs for the distribution of funds from the Oregon Lottery to economic development projects in communities throughout the State. The program provides grant and loan assistance to eligible municipalities primarily for the construction of public infrastructure which support commercial and industrial development that result in permanent job creation or job retention. To be awarded funds, each infrastructure project must support businesses wishing to locate, expand, or remain in Oregon. SPWF awards can be used for improvement, expansion, and new construction of public sewage treatment plants, public water supply works, public roads, and public transportation.

While SPWF program assistance is provided in the form of both loans and grants, the program emphasizes loans in order to assure that funds will return to the State over time for reinvestment in local economic development infrastructure projects. The maximum loan amount per project is $11,000,000 and the term of the loan cannot exceed the useful life of the project or 25 years, whichever is less. Interest rates for loans funded with the State of Oregon Revenue Bonds are based on the rate the State may borrow through the Oregon Economic Development Department Bond Bank. The Department may also make loans directly from the SPWF and the term and rate on direct loans can be structured to meet project needs. The maximum grant per project is $500,000, but may not exceed 85% of the total project cost.

Baker City is currently using these funds to partially fund the 23rd Street Construction Project. Other jurisdictions that have received SPWF funding for projects including some type of transportation related improvement are the Cities of Cornelius, Woodburn, Forest Grove, Portland, Reedsport, Wilsonville, Redmond, Bend, and Douglas County.

ODOT Funding Options

The State of Oregon provides funding for all highway related transportation projects through the Statewide Transportation Improvement Program (STIP) administered by the Oregon Department of Transportation. The STIP outlines the schedule for ODOT projects throughout the State. The STIP, which identifies transportation for a three year funding cycle, is updated on an annual basis. Starting with the 1998 budget year, ODOT will then identify projects for a 4 year funding cycle. In developing this funding program, ODOT must verify that the identified projects comply with the Oregon Transportation Plan (OTP), ODOT Modal Plans, Corridor Plans, local comprehensive plans, and ISTEA Planning Requirements. The STIP must fulfill ISTEA planning requirements for a staged, multi-year, statewide, intermodal program of transportation projects. Specific transportation projects are prioritized based on a review of the ISTEA planning requirements and the different State plans. ODOT consults with local jurisdictions before highway related projects are added to the STIP.

The highway related projects identified in the Baker City Transportation System Plan will be considered for future inclusion on the STIP. The timing of including specific projects will be determined by ODOT based on an analysis of all the project needs within Region 4. The Transportation System Plan will provide ODOT with a prioritized project list for the Baker City Urban Area for the next 20 years. Baker City, Baker County and ODOT will need to communicate on an annual basis to review the status of the STIP and the prioritization of individual projects within the project area. Ongoing communication will be important for the City, County, and ODOT to coordinate the construction of both local and state transportation projects.

ODOT also has the option of making some highway improvements as part of their ongoing highway maintenance program. The type of road construction projects that can be included within the ODOT maintenance programs includes intersection realignments, additional turn lanes, and striping for bike lanes. The addition of a left-turn lane on a state highway is the type of project that may be constructed through the ODOT maintenance program. Maintenance related construction projects are usually done by ODOT field crews using

State equipment. The maintenance crews do not have the staff or specialized road equipment needed for large construction projects.

An ODOT funding technique that will likely have future application to the Baker City Transportation System Plan is the use of state and federal transportation dollars for off-system improvements. Until the passage and implementation of ISTEA, state and federal funds were limited to transportation improvements within highway corridors. ODOT now has the authority and ability to fund transportation projects that are located outside the boundaries of the highway corridors. The criteria for determining what off-system improvements can be funded has not yet been clearly established. It is expected that this new funding technique will be used to finance local system improvements that reduce traffic on state highways or reduce the number of access points for future development along state highways.

Baker County Funding Options

The Baker City Transportation System Plan area includes roads that are under the maintenance jurisdiction of Baker County. These include a portion of 17th Avenue within the City and all of the roads outside the city. The County retains jurisdiction of county roads within the Urban Growth Boundary until they are annexed by the city. Baker County provides maintenance for the county roads while Baker City maintains the city streets. Baker City does not receive any money from Baker County for road construction or maintenance.

Baker County does not have an updated Capital Improvement Plan (CIP) for transportation projects. The County is in the process of developing a comprehensive inventory of their road system. After the inventory has been completed, a classification will be applied based on the amount of service. A new CIP is expected to be prepared after the inventory and road classification phases are completed. The intent of the new CIP will be to plan transportation projects for the entire County and to coordinate funding construction with all the incorporated cities. The projects identified in the Baker County Transportation System Plan and the Baker City Transportation System Plan can form the basis for a new County CIP.

The County does not have a Systems Development Charge (SDC) fee program in place at the present time. The funds generated from an SDC program would be used to finance County transportation projects in the future. Some of these funds could be used to upgrade county roads within the Baker City Urban Area. At this point, Baker County has not yet determined the amount of revenue a transportation SDC would generate in the County.

Local Improvement Districts (LIDs) are a public works infrastructure funding option available to the County. Past LIDs have been used for a range of projects such as road improvements and the extension of water mains.

A short term serial levy could be used by Baker County as a funding method to supplement limited property taxes and State revenue sharing moneys for county transportation system improvements. The serial levy would likely be established to run from one to three years and would be used to finance specific transportation projects within the unincorporated areas of the county. Revenues generated from such a levy could be used to fund some county road projects in and around Baker City. However, as with the consideration of a SDC fee, Baker County will not likely consider a special transportation serial levy until after work has been completed on the transportation road inventory and the application of uniform road classifications.

BAKER CITY TRANSPORTATION SYSTEM PLAN FUNDING REQUIREMENTS

The Baker City Transportation System Plan identifies a range of transportation improvements that will be needed during the next 20 years to address existing problems and expand the transportation system to support a growing population and economy. The improvements include street, pedestrian and bikeway projects. The cost of the Baker City improvements are shown in Table 8-5. The costs are identified by both level of priority and which jurisdiction should take the lead funding role.

The total cost of street, pedestrian and bikeway projects expected to be over 10 million over the next 20 years. It is recommended that $3,264,000 (32 percent) be funded as high priority projects during the first five years of the plan. A total of $3,705,000 (36.5 percent) is expected to be funded as medium priority, taking 6 to 15 years to complete. A total of $3,187,000 (31.5 percent) in low priority projects are also planned which would be implemented in the last five years of the plan. The majority of improvement project (96 percent) are expected to be funded through City initiated sources, while ODOT would have primary funding responsibility for the remaining 4 percent.

Table 8-5
Baker City Improvement Options: Funding Requirements

Project Description	Local Cost ($)	State Cost ($)	Total Cost ($)
HIGH PRIORITY (0-5 Years)			
Street System Projects	644,000	10,000	654,000
Pedestrian Projects	1,856,000	390,000	2,165,000
Bikeway Projects	416,000	29,000	445,000
Subtotal - High Priority Projects.	**2,916,000**	**348,000**	**3,264,000**
MEDIUM PRIORITY (6-15 Years)			
Street System Projects	2,150,000		2,150,000
Pedestrian Projects	1,203,000		1,203,000
Bikeway Projects	340,000	12,000	352,000
Subtotal - Medium Priority Projects	**3,693,000**	**12,000**	**3,705,000**
LOW PRIORITY (16 to 20 Years)			
Street System Projects	2,500,000		250,000
Pedestrian Projects	589,000		589,000
Bikeway Projects	86,000	12,000	98,000
Subtotal - Low Priority Projects	**3,175,000**	**12,000**	**3,187,000**
TOTAL	**9,784,000**	**372,000**	**10,156,000**

Oregon Department of Transportation Projects

ODOT will need to be the primary funding source for future improvements that impact the operation of or reduce the amount of local traffic on the State highways within the urban area. The ODOT related transportation improvement projects include $10,000 of street system improvements, $309,000 of pedestrian system improvements, and $53,000 of bikeway system improvements all located on state highways.

Local Projects

Walkway & Bikeway Improvements

Baker City's Transportation System Plan identifies several pedestrian and bikeway improvements recommended for the Baker City Urban Area during the next 20 years. The sidewalk related improvements to improve pedestrian access within the community are estimated to cost $3,648,000. The bikeway improvements are expected to cost an additional $842,000. Funding for these improvements would be expected to come primarily from local sources with some assistance from ODOT. Local funds can be generated through LIDs along local streets within Baker City. ODOT would be expected to fund the pedestrian and bikeway improvements along State Highways within the planning area.

Basic Street Grid Improvements

An extensive list of local improvement street improvements have been identified in the Transportation System Plan totaling $5,294,000. The purpose of these improvements will be to continue to improve the street grid pattern throughout the city and the urban area. Funding for these improvements would come from Baker City, Baker County, and ODOT. Some of the basic grid street improvements that would reduce reliance on the state highways could be funded by ODOT in the future. The locally generated funds would include revenues generated by SDC fees for new developments, and LIDs.

BAKER CITY TRANSPORTATION SYSTEM PLAN FUNDING STRATEGY

Baker City, Baker County, and ODOT will need to coordinate and cooperate on a funding strategy to fund the Capital Improvement Plan. It is recommended that ODOT continue as the lead agency in funding the transportation related improvements along Highway 7 and Highway 30 corridors. Baker City will need to continue as the lead local government in financing the local transportation system improvements. Baker County would be expected to assist in funding improvements to county roads within the Baker City Urban Area. In order to increase funding to implement the Baker City Transportation System Plan, the City, County, and ODOT will all need to consider a range of possible funding sources during the next 20 years. The recommended funding strategy for the Baker City Transportation System Plan is detailed below.

Baker City

The Baker City Capital Improvement Program of the future should concentrate on funding improvements to the basic street grid and to the area pedestrian and bikeway systems. The adoption of the Transportation System Plan will provide an extensive list of local transportation related projects that should be constructed over the next 20 years. Baker City will need to increase funding to construct the identified projects. Likely funding sources include increasing the existing transportation and increasing the use of LIDs for local pedestrian and bikeway projects. The City will need to work closely with Baker County and ODOT on developing funding strategies for non-city urban roads and state highway improvements.

Local Gas Tax

Based on a preliminary analysis conducted by the City in recent years, it may be possible to generate funding for transportation projects from a local gas tax. If a local gas tax is implemented, the Baker City revenues should be dedicated towards funding the basic street grid system improvements. It is recommended that Baker City evaluate a local gas tax and consider including Baker County in any local gas tax proposal.

Local Improvement Districts

Baker City has a strong Local Improvement District (LID) Ordinance which permits the formation of districts for transportation related projects. The City has actively used LIDs in the past to fund local street projects. It is recommended that Baker City implement a program to target future LIDs for pedestrian and bikeway improvements within the residential areas of the City. As part of such an LID program, the City should consider funding a portion of the LIDs to make them affordable to property owners.

County and ODOT Coordination

Baker County will need to be the lead funding agency for the improvement of county roads within the Baker City Urban Growth Boundary. Both the City and County should consider formulating a joint Capital Improvement Program for the Baker City Urban Area. Such a CIP would be a refinement of the Baker City and Baker County Transportation System Plans. This refined CIP should include all the street, pedestrian, and bikeway projects that have been identified for the Baker City Urban Area. As part of the process of formulating a joint Urban Growth Area CIP, Baker County should be encouraged to adopt a transportation SDC fee and join the discussions on adoption of a local gas tax. Baker County and the Baker City will need to work closely together on funding techniques that will finance the transportation system improvements.

All transportation related improvements on Highway 7 and Highway 30 are assumed to be funded by ODOT. With the adoption of the Transportation System Plan, ODOT will consult Baker City before any highway related projects are added to the State Transportation Improvement Program (STIP) plan. In the future, ODOT may have the ability to assist in funding some of the basic street grid projects that reduce dependence on the State highways. As Baker City plans local street improvement projects, ODOT should be consulted to determine whether state transportation funds can be used for specific local transportation projects.

Baker County

Baker County has jurisdiction over all local roads within the Baker City Urban Growth Area. As the urban area is developed, it is expected that the county roads will be upgraded to city standards and turned over to city jurisdiction at the time of annexation. The County's contribution to the Baker City Transportation System Plan should include funding the extension of the county roads detailed as part of the basic street grid improvement option, and to bring the non-city urban area roads up to city standards and expanding the pedestrian and bikeway systems throughout the urban area. Adoption of a county-wide transportation SDC will likely be the best funding technique to bring the non-city roads up to city standards. Another possible funding technique will be the consideration of a county gasoline tax.

Baker County will not likely be in a position to increase funding for transportation related projects in the Baker City Urban Area until after work has been completed on a new county road inventory. As discussed earlier in this chapter, Baker County is currently involved with developing a detailed inventory of the entire County transportation system. Likewise, the County will then consider adopting a road classification for all arterial and collector roads under their jurisdiction. Until the inventory and road classification process is completed, it will be difficult to make projections on what are the most viable funding techniques to enable Baker County to bring the urban area roads up to city standards.

Transportation System Development Charges

Baker County should evaluate the feasibility of adopting a county-wide transportation SDC. If a transportation SDC is adopted by Baker County, the fees collected within the Baker City Urban Area should be dedicated to bringing the county roads up to city standards. This funding strategy can also be used to help finance the needed basic street grid improvements and bring non-city streets up to city standards. As discussed above, Baker County will not likely be in a position to consider adopting a transportation SDC until after work has been completed on the county road inventory and road classification.

Local Gas Tax

The passage of a local gas tax measure could be a new funding source for Baker County. All funds generated by such a tax would need to be dedicated towards transportation projects within the County. It is recommended that Baker County participate with Baker City in discussions with other local communities regarding a possible regional area gas tax.

Oregon Department of Transportation

ODOT will be responsible for funding all highway related transportation projects within the Baker City Transportation System Plan boundaries. Other than consulting with the City as part of the STIP process, ODOT has the authority to prioritize highway projects based on their own analysis and evaluation. The adoption of the Baker City Transportation System Plan will provide ODOT with highway related transportation projects that are important to Baker City and Baker County.

The one new ODOT funding technique that should be considered for the Baker City Transportation System Plan is possible use of state money to fund off-system improvement that reduce reliance on the state highway system. A policy to enable ODOT to use this possible new funding technique is still being formulated as the Baker City Transportation System Plan is being completed. It is recommended that Baker City consult ODOT on a yearly basis regarding state funding options for local street improvements.

BAKER CITY TRANSPORTATION FUNDING PLAN

Identified Street Improvement Projects

Approximately $10 million in transportation system improvements are projected to be required within the Baker City Urban Area over the next 20 years. It is assumed that ODOT will fund improvement projects within state right-of-way. Baker City would be responsible for funding the remaining transportation system costs over the next 20 years.

A review has been conducted of a range of alternative transportation funding mechanisms that are available to the City. This review was done in order to develop a list of options which are considered to be the most feasible methods to fund the local projects. A funding package combining system development charge revenues, state gas tax revenues, Local Improvement Districts, as well as some type of debt financing mechanism backed by property taxes, represents the most feasible funding strategy available to the City to meet expected capital and maintenance funding needs.

System Development Charges

Baker City should consider the implementation of a transportation System Development Charge (SDC). A systems development charge (SDC) is a means of requiring that new developments pay an equitable portion of the capital costs of improvements needed to accommodate growth. State law allows the imposition of systems development charges for specified purposes. The requirements and limitations are found in the Oregon Revised Statutes (ORS) 223.297 to 223.314. This section of the report outlines the methodology for a transportation systems development charge. It identifies SDC funding options for projects to meet the long-range transportation needs of Baker City.

The basic methodology used to assess transportation SDC fees was to compare employment, dwelling units, and forecasted trips with street improvement needs for year 2015. This section of the report describes the calculations upon which the charge per trip is based. The charge is calculated by dividing the eligible costs of transportation projects by the forecasted trips which cause and will benefit from the needed improvements. SDC-eligible projects increase capacity and service. An SDC fee levied against a development is derived by determining the number of trips the development will create and multiplying this by the per trip fee.

The growth assumptions for Baker City are documented elsewhere, but are summarized in Table 8-6. This table lists anticipated increases in both residential development and employment between 1995 and 2015. In addition to the number of dwelling units and employment increases, Table 8-6 lists the *average* number of trips created on a daily basis by these broad land use categories. These are the figures used in the computer-based transportation model used to assess Baker City's long-range transportation system needs. An increase of almost 17,000 daily trips within Baker City is forecasted between 1995 and 2015.

Table 8-6
Projected Increase In Trip Generation From New Development; 1995 - 2015

Development Type	Projected Increase in Number of Units	Trips/Unit [1]	Projected Increase in Number of Trips
RESIDENTIAL DEVELOPMENT			
Single-family	454 Dwelling Units	9.55 Trips/Dwelling Unit	4,336 Trips
Multi-family	202 Dwelling Units	6.47 Trips/Dwelling Unit	1,307 Trips
NON-RESIDENTIAL DEVELOPMENT			
Commercial	619 Employees	17.5 Trips/Employee	10,833 Trips
Industrial	110 Employees	1.06 Trips/Employee	117 Trips
TOTAL TRIPS			**16,593[2] Trips**

[1] ITE Trip Generation Manual, 5th Edition, 1991
[2] Assumes unincorporated land areas within UGB will be annexed to the City within 20 year plan life.

The key assumption for the SDC program is that these trips directly cause the need for substantial improvements to the City's transportation system. The total cost of transportation projects under the City's jurisdiction are estimated to be $9,784,000. The basic concept behind a project-based systems development charge is to divide the cost of needed projects by the number of trips expected to occur during the same time period. If Baker City seeks to recover all costs for construction of street projects from new development through SDC fees, the calculation is as follows:

$9,784,000 / 16,593 = $ 589.65 per trip.

Note that certain other costs associated with annual monitoring and compliance are also eligible for recovery under the SDC program and are permitted under the ORS. Bookkeeping and documentation associated with these compliance activities may not make the option attractive to Baker City. Since Baker City already has a transportation systems development charge in place, the methodology needs to be reviewed only briefly. Typically, SDC's are levied on new developments and are collected at the time of issuance of a building permit or as otherwise provided for by the ordinance.

One potential change to Baker City' SDC program is to change the basis upon which the fee is calculated. The amount of the transportation systems development charge levied against a development is most easily explained if it is based upon the average daily number of trips generated multiplied by the per trip fee calculated above. The trip rate for each use should be derived from the latest edition of the Institute of Transportation Engineers report, *Trip Generation (Fifth Edition, 1991).*

Baker City has the option of choosing the amount of funding it wants to recover from new development to pay for needed long-range transportation improvements. To recover 100 percent of the nearly $10 million needed to fund all local projects, the SDC fee is calculated to be $589.65 per trip. If the City chooses to collect only one-fifth of the $10 million amount, the SDC fee could be lowered to approximately $118 per daily trip. The remaining 80% would come from existing or other new funding sources.

The fee is determined by multiplying the number of units by the per unit trip generation rate. The trip generation rates should be based on the latest edition of the Institute of Transportation Engineers report, *Trip Generation (Fifth Edition, 1991)*. The City may also give the developer the option of submitting a detailed traffic study to establish a trip generation rate for a specific project. The traffic study should be prepared by a licensed traffic engineer in the State of Oregon.

Table 8-7 provides sample calculations for recovering future transportation costs using SDCs. Recovery rates vary from 20 percent of the total cost to 100% of the total cost. For residential developments, SDCs should be based on the number of trips per dwelling unit. For non-residential uses, SDCs should be based on either the number of trips per employee, as shown in the table below, or the number of trips per thousand square feet of gross floor area.

Table 8-7
Calculation of SDCs to Cover Future Transportation Costs; 1995 - 2015

		Trips/	SDC Rate/Unit for % Recovery				
Development Type	**Unit**	**Unit**	**20%**	**40%**	**60%**	**80 %**	**100%**
RESIDENTIAL DEVELOPMENT							
Single-family	Dwelling Unit	9.55	$1126.23	$2252.46	$3,378.69	$4,504.93	$5,631.16
Multi-family	Dwelling Unit	6.47	$763.01	$1,526.01	$2,289.02	$3,052.03	$3,815.04
NON-RESIDENTIAL DEVELOPMENT							
Commercial	Employee	17.5	$2,063.78	$4,127.55	$6,191.33	$8,255.10	$10,318.88
Industrial	Employee	1.06	$125.01	$250.01	$375.02	$500.02	$625.03

The SDC fee for a development is determined by multiplying the number of units times the appropriate trip generation rate per unit times the SDC rate per trip.

Cities or counties are sometimes concerned that their SDC fees will discourage desired development and choose to adjust the methodology as a matter of policy. In doing so, these agencies also accept the fact that by lowering SDC fees, they will need to find other funding sources to pay for needed transportation projects. Besides the option of choosing a lower recovery percentage, the City may consider other methods of reducing transportation SDC fees. Some of the options the City might consider are: adjustments to account for "pass-by" trips, combining specific land uses into broader development categories, or placing "caps" or maximums on the trip generation rate.

An adjustment to account for "pass-by" trips has an impact on commercial developments. For some uses within the retail sector, a variety of studies indicate some trips are pass-by trips. That is, the trip to an individual business is merely an intermediate stop as part of a longer trip made by a motorist who is passing by. The argument is that since the motorist was using the street anyway, a lesser impact on the street system occurs than would with a non-passer-by trip. The only employment sector for which a pass-by component has been identified is the retail sector. Furthermore, not all retail businesses have a pass-by component. Using a pass-by adjustment would have no impact on SDC fees for residential development.

Another possibility for reducing the SDC fees for some businesses involves combining some categories. Fast food restaurants generate approximately seven times as many trips per thousand square feet than do quality restaurants. In an effort to encourage fast food restaurants, some cities establish a single "restaurant" category and apply the lower trip generation rate from the "quality restaurant" category. In doing so, these cities forego much of the SDC revenue from the development and must find other funding sources to accommodate the transportation needs caused by that restaurant.

Yet another common approach used by cities is to establish a "cap" or maximum rate to be used in the calculation of trips. This is sometimes set at 200 or 300 trips per thousand square feet. This has the effect of limiting the fees collected from fast food restaurants and convenience markets. Like other adjustments, a cap on trip rates reduces SDC fee collections and forces the cities to find other funding sources.

Additional types of funding will need to be considered in order to reduce the SDC requirements. The City will need to make a determination on what levels of System Development Charges best fit the City's overall growth strategy and development policies.

Since SDCs are a less stable form of revenue than more secure forms such as property taxes, Baker City will likely need to secure debt paid by the SDC program with additional forms of revenue such as gas tax receipts. In the event that future SDC inflows were not sufficient to pay required debt service, then investors would have claim on additional pledged City revenues. Even with the pledge of other revenues, the City would have a higher cost of borrowing than it would with general obligation debt in order to compensate investors for the additional perceived risk associated with purchasing the City's SDC-based bonds.

General Obligation Debt Secured By Property Taxes

General obligation bond financing secured by property tax revenues is a common method of financing road improvements. Due to the tax's strong security, general obligation bonds are the least costly debt financing tool available to local governments.

Oregon revised statutes provide that the total outstanding general obligation indebtedness of a city not exceed three percent of the city's true cash value. Bonds issued for water, sewer, and utility purposes are excluded from the 3% limitation. For example, if the City's projected 1996/1997 true cash value of $300 million and netting out legal deductions, the City's debt limit would be over $8 million (Table 8-8). This is the remaining capacity that the City has available to issue additional general obligation debt for transportation or any other public improvements. Because the City is growing, it should be able to add more assessed value in future years to its tax roll and be able to increase the issuance limit for general obligation debt.

INC.

Table 8-8
Hypothetical City Street Fund Calculation of Legal Debt Limit

Time Cash Value	$300,000,000
	x 3%
	$9,000,000
Current Bonded Debt (Less Legal Deductions)	
Industrial Park Bonds	
Phase I	$500,000
Phase II	$200,000
Sewer Bonds (Not Subject to 3% Debt Limit)	$1,650,000
Net Debt Subject to 3% Limitations	$700,000
Amount Available for Future Indebtedness	$8,300,000

Given the City's current debt limitation, bonds to cover the cost of some of the transportation improvement options can be issued up to about $8 million. The role of the general obligation bond financing in the City's overall funding program will be dependent on the willingness of the council to dedicate some or all of the City's debt capacity to street improvements. The City will have the ability to issue GO bonds, with repayment by SDC fees. Since these bonds will be secured by the full faith of the City, the bond rates will have a lower interest rate. In addition, this funding technique would not require an increase to the City property tax rate.

BAKER CITY TRANSPORTATION SYSTEM PLAN FUNDING RECOMMENDATIONS

In the funding requirements section, a total of about $10 million in State and Local transportation improvement projects were identified (Table 8-5). This total includes the funds needed for both State highway and local street system improvements. The analysis assumed that ODOT would continue to be the primary funding agency for $372,000 for Highway improvements Baker City, with some possible financial assistance from Baker County, would have primary funding responsibility for the $9,784,000 in local transportation system improvements during the next 20 years.

The nearly $10 million in projects are phased over 20 years. In the next five years, the city will need to fund the high priority projects which amount to $2,916,000 in city responsibility. The medium priority projects will be constructed in 6 to 10 years and will require another $3,693,000 in city generated funds. The low priority projects will be implemented between 2006 and 2016 and will require a final 3,175,000 dollars. Funding plans should be crafted to provide consistent funding for these projects over a 20-year implementation span as opposed to generating the $10 million up front.

The recommended funding techniques for the Baker City Transportation System Plan have been detailed in the proceeding section. Based on an analysis of historic local funding techniques, it is expected that Baker City will not be able to fund the Transportation System Plan improvement projects unless existing fees are increased and new funding sources are dedicated towards transportation. Even with Baker City, Baker County, and ODOT adopting new funding techniques, it may be difficult to fund all the Transportation System Plan projects during the 20 year planning cycle. The City may want to consider a process to prioritize the local transportation system funding based on a further analysis of available funding.

Baker City, Baker County, and ODOT should implement the following actions to fund the Transportation System Plan projects:

City of Baker City

Implement Transportation SDC Fee

It is recommended that the City implement a transportation SDC fee for new development This action will enable Baker City to finance a portion of the local Transportation System Plan improvement projects.

Baker County Funding Request

It is recommended that the City request that Baker County provide future funding to improve all non-city urban roads within the Baker City UGB to city standards. This funding would be used to upgrade existing county roads and to extend future roads to improve the local street grid system.

General Obligation Bond Financing

It is recommended that the City use a portion of the City's bonding debt authority to issue General Obligation bonds to fund a portion of the Transportation System Plan projects. The bonds should be secured with future SDC fee revenues to make the bonds attractive to investors. The funds obtained through a GO bond sale should be dedicated towards specific street local street improvement projects identified within the Transportation System Plan.

Local Gasoline Tax

It is recommended that the City adopt a 1 to 2 cent local gasoline tax dedicated towards maintenance of the transportation system.

ODOT Off-System Funding

It is recommended that the City request ODOT to use Off-System funds to finance a portion of the local street improvements that specifically reduce traffic on either Highway 7 or 30 within the Transportation System Plan boundaries.

Street Improvement LIDs

It is recommended that Baker City strengthen their comprehensive Local Improvement District program.

Baker County

Systems Development Charges (SDC) Fee

It is recommended that Baker County continue their evaluation of a County-Wide transportation SDC. As part of the County-Wide evaluation, it is also recommended that Baker County implement a transportation SDC for the Baker City Transportation System Plan planning area. Fee revenues received from new development within the Baker City Transportation System Plan area should be dedicated to the basic street grid improvements identified in the Transportation System Plan. These county generated funds can be used to finance county road improvements that are part of the basic street grid in the Baker City Urban Area.

Local Gas Tax

It is recommended that Baker County consider passage of a local gasoline tax dedicated to transportation improvements. A portion of these gas tax revenues should be used to finance the local basic street grid improvements within the Transportation System Plan boundaries.

Street Design Standards

It is recommended that Baker County amend the City/County Urban Growth Management Agreement (UGMA) to require city street design standards for new development within the Baker City Urban Growth Area.

APPENDIX A - REVIEW OF EXISTING PLANS AND POLICIES

TECHNICAL MEMORANDUM
BAKER COUNTY / BAKER CITY TRANSPORTATION SYSTEMS PLAN

The following memorandum summarizes the major transportation elements within the existing Comprehensive Plan, Zoning, and Subdivision Ordinances for Baker City and Baker County, Oregon. Any conflicts between the above documents are discussed and documented, as are any inadequacies relative to the Transportation Planning Rule (Goal 12).

1. BAKER COUNTY COMPREHENSIVE PLAN

The Baker County Comprehensive Plan inventoried and discussed the existing modes of transportation within the County, circa 1983. The Transportation Element of the Plan focused on the transportation issues within Baker County.

A. *TRANSPORTATION ELEMENT*

The intent of the Transportation Element was to provide the basic guidelines for a transportation system within Baker County, as well as to provide a comprehensive inventory of the existing transportation systems. A brief summary of the inventory follows.

Supplementing the Transportation Element of the Baker County Comprehensive Plan are the County road index maps and the "County Road Inventory Description Record for Baker County." The Road Inventory documented 954 miles of road within the County, 171 miles were indicated as being paved while the other 783 were divided between dirt and gravel surfaces. The Road index Map marked the following roadways as the major thoroughfares within the County:

- Interstate 84 - NW/SE from North Powder to Huntington,
- U.S. 245 - Dooley Mountain Highway,
- U.S. 30,
- Oregon 26 - John Day Highway,
- Oregon 7 - Whitney Highway, and
- Oregon 86 - Copperfield Highway.

In addition to referring road inventory to the Inventory Description Record and the Road Index Map, the Findings section of the Transportation Element deferred Air Transportation discussions to the Baker Municipal Airport Master Plan (1978).

Mass transit, interstate rail, bus passenger service, freight service, and transportation gas lines (natural gas and petroleum distillates) were considered to be economic alternative modes of transportation. Discussion of how or to what extent each of the above may play a role in the future was not provided.

Bicycle and pedestrian modes were not considered practical year-round methods of transportation outside of the urban growth boundaries.

The Land Use Policies section of the Transportation Element provided the guidelines for transportation systems development and maintenance for the Comprehensive Plan. The County recognized that... *seldom are transportation improvements under the exclusive direction of County government* and therefore recommended the following policies be adopted by other public agencies; such as cities, Federal and or State highway administrations, or the U.S. Forest Service. (pp. XII-2-3).

- Road improvement from Baker County to scenic views of and from the Western rim of Hells Canyon.

- Burnt River Canyon road should be included in the Oregon State Highway System.

- Lands surrounding the airport shall be protected from development that is incompatible with the airport.

- Consideration of a broad based Airport Authority or Port District to own and operate the Baker Municipal Airport.

- U.S. Forest Service should be encouraged to complete the North Pine Road to an improvement standard similar to the connecting forest service road in Wallowa County.

- Local terminals for industrial and commercial consumption of pipeline products should be made available when needed to support economic development of the County.

- Interstate rail, bus passenger, and freight service should continue to be available in the County.

- Local mass transit (private) passenger services shall be expanded as the need and economic practicality becomes apparent.

- Public subsidized bus transportation shall be continued for the transportation disadvantaged as the need is demonstrated and budgetary priorities will allow.

- The County will cooperate with the Oregon Department of Transportation in supporting pedestrian paths and bicycle paths as the demand for such facilities becomes prevalent.

- The County supports the attempt to reinstate a regularly scheduled commuter airline serving Baker County residents and businesses.

Three pipelines within the County were identified in the Natural Resources Element (LDCD Goal 5), while transportation concerns were touched upon within the Findings section of the Recreation Element (LDCD Goal 8).

Transportation concerns were not discussed in either the Conservation Element or the Urbanization Element of the Plan.

2. BAKER COUNTY ZONING AND SUBDIVISION ORDINANCES

A. *ZONING ORDINANCE*

The Baker County Zoning Ordinance (revised 1991) includes reference to various modes and systems of transportation in the following land-use zones and provisions:

- Sec. 301 (A)(7-10) (B)(20-21) - Exclusive Farm Use Zone (EFU) - Outright uses concerning roadway and rights-of-way improvements.

- Sec. 301 (B)(8) - EFU - Conditional use permitted to personal-use airports.

- Sec. 301 (D)(1) - EFU - Criteria for evaluation of all conditional uses concerning transportation.

- Sec. 302 (B)(1)(i) - Timber Grazing Zone (TG) - Conditional use permitted to personal-use airports.

- Sec. 312 - Airport Development Zone (AD) - Regulations regarding land-use within AD zone.

- Sec. 313 - Airport Overlay Zone (AO) - Regulations regarding land-use within AO zone.

- Sec. 318 (G)(1) - Limited Use Combining Zone (LU) - Site plan requirements concerning access and parking within LU.

- Sec. 401 (B)(2) - Setback and frontage requirements in regards to the orientation of structures to streets.

- Sec. 404 - Access.

- Sec. 405 - Clear Vision Areas.

- Sec. 406 - Off-Street Parking.

- Sec. 602 (E)(3-5) - Additional standards for conditional use concerning transportation systems.

- Sec. 603 (A)(1) (C)(5) - Standards for selected conditional uses concerning transportation systems.

B. *SUBDIVISION ORDINANCE*

The Subdivision Ordinance for Baker County (revised 1991) is incorporated into the Zoning Ordinance in Articles 7-12. The Subdivision requirements include reference to transportation systems in the following sections:

- Sec. 703 (B)(1)(a)(2) (B)(5) (B)(10)(a) - Requirements for Planned Unit Development (PUD) application regarding transportation concerns.

- Sec. 705(D)-Parking requirements for PUD.
  Sec. 706(A)

- Sec. 711 (F), (G) - Findings for PUD project approval considering roadways and transportation needs.

- Sec. 906 (F) - Transportation elements required on Environmental Impact Report.

- Sec. 1004 (B) - Requisites for approval of tentative plan, plat, or map concerning transportation - street design; zoning compliance.

- Sec. 1005 (D), (E) - Requisites for approval of final plan, plat, or map concerning transportation.

- Sec. 1007 (G) - Required contents of tentative plans of subdivisions and major partitions regarding transportation.

- Sec. 1010 - Standards for roads or streets - At the time of the ordinance this section was not completed.

3. CONFLICTS/DISCREPANCIES WITHIN BAKER COUNTY COMPREHENSIVE PLAN AND CODES, AND INADEQUACIES RELEVANT TO THE TRANSPORTATION PLANNING RULE (GOAL 12)

There are few conflicts between the Plan and the Codes. This is primarily because the plan only recommends planning policies, rather than providing actual guidelines. Other public agencies are left to fulfill the task of concrete planning policies. However, while the Plan does address alternative modes of transportation, the codes do not reflect this apparent concern.

Both of the documents remain inadequate relative to the Transportation Planning Rule. The Plan does not require County wide planning guidelines in regards to transportation, and therefore, the Codes do not contain adequate requirements.

Both the Plan and the Codes need to address specific design standards for streets, sidewalks, bikeways, and other transportation facilities, in addition to requiring bicycle parking facilities and consideration of access and the connectivity of all applicable transportation modes within planned developments.

The following is a list of items needed within the Comprehensive Plan and the Codes to facilitate the Goal 12 process.

- Complete inventory of existing County transportation facilities (cities with adequate sidewalks, bicycle ways, transit, street condition, particular problem areas, etc.). The supplementary material to the Plan provided a rather complete inventory, but it needs to be consolidated within the Plan.

- Further plans for bicycle and pedestrian modes (travel ways, parking facilities, recreational consideration).

- Consideration of setback requirements and smaller street widths to encourage slower traffic through population centers.

- Further discussion coordinating Federal, State, County, and local agencies to plan for future transportation systems that meet the needs of a variety of users.

- Drawings and design specifications for streets, sidewalks, and bicycle ways. These are notably absent from the Subdivision Ordinance.

- Discussion of access management and urban traffic control measures for motor vehicle, pedestrian, bicycle, and transit transportation.

4. BAKER CITY COMPREHENSIVE PLAN

The Baker City Comprehensive Plan inventoried and discussed the existing modes of transportation within the County, circa 1978. The Transportation Element of the Plan focused on the transportation issues within Baker City.

A. *TRANSPORTATION ELEMENT*

The intent of the Transportation Element was to provide the basic guidelines for a transportation system within Baker City, as well as to provide a comprehensive inventory of the existing transportation systems.

The Findings section of the Transportation Plan inventoried the existing facilities within Baker City. A brief summary of the inventory follows (pp. 21-23).

- More than 86 miles of street right-of-way were within the incorporated city limits, representing more than 30% of all developed land area in the City. 13.34 miles were unpaved, but open streets.

- The following public and freight transportation was indicated to be available at the time of the Plan:

    - Air - charter, air ambulance, and limited freight were available at the Baker Municipal Airport.

    - Bus - Interstate bus service was provided by Greyhound lines on a regular schedule. There was also a city/county senior citizen bus providing in town service as well as service between outlying communities and Baker City.

- Rail - Amtrak provided passenger service and Union Pacific handled freight.

- Taxi - Baker Cab, franchised by the City, was available for local point-to-point transportation.

- Trucking - Local and interstate transport was provided by six firm. The Plan did note a decrease in service.

◆ Street improvements were being funded from serial levies. Plans for future improvements included:

- A through north-south route form the central area of the city to Hughes Lane.

- A more direct street pattern requiring new right-of-way for "turning the corner" on Indiana Avenue and the Reservoir Road.

- Continuation of I-84 East Side Frontage Road to a connection with Campbell Street.

- Northerly extension of College Street to Hughes Lane.

- "D" Street bridge over the Powder River.

- Easterly extension of Hughes Lane from is present terminus to Plum Street extended.

- Hughes Lane widening.

- Downtown Parking facilities.

◆ The main airport runway, 12-30, was reconstructed in 1983-84. The Master Plan provided future plans for the secondary runways in need of repair.

◆ Sidewalks existed in nearly all areas of town with streets developed to primary standard. In other areas sidewalks were indicated as being "spotty."

◆ Two bike paths existed: along Ceder Street, from Hughes Lane to Campbell, and along Highway 7, from the underpass to Indiana Ave.

- A truck route ordinance prohibited truck traffic and truck parking on certain streets within the City limits.

The Plan identified Policies as guidelines for future transportation planning efforts. The following policies have been incorporated into this document from the Baker City Comprehensive Plan (pp. 24-25).

- City shall determine street status designation on a continuing basis.

- Street construction standards, signing, and all services (for example, sweeping and snow removal) shall correspond with these designations and be appropriate to the particular street's design and use.

- City shall designate truck routes and enforce their use where necessary and desirable.

- City will strive to facilitate variety and adequacy of the transportation services available to the community.

- City shall repair and construct new, and generally upgrade its streets to the greatest extent possible recognizing monetary constraints.

- Airport facilities shall be maintained at a level which is adequate for the safety of its use and protects the capital investment in existing improvements.

- Sidewalks shall be encouraged in appropriate areas for reasons of safety, ease of pedestrian movement, and as a buffer between street and privately-owned land uses.

- Bike paths may be designated and/or constructed wherever possible to make bicycling safe, enjoyable and an efficient alternative to local motorized transport. Potential recreational use shall be considered as well, particularly in designating routes inappropriate for motor vehicle traffic.

- Any proposed right-of-way extension, opening, addition, widening, or improvement, closure or vacation must be formally approved and accepted by the City. Also, any provide use of any public right-of-way must receive prior approval. The City may, at its discretion, require certain improvements be made or make other stipulations as a condition to the City's acceptance of any street or alley use. This is done specifically for reasons of the City's liability in public right-of-way, maintenance obligation, police patrol, fire access and responsibility generally for the public peace, safety and welfare.

In addition to the Findings and Policies sections of the Transportation Element Baker City also included an Implementation section which outlined the continuing transportation planning efforts to insure that policies were instituted and updated. Integral to the implementation of the projects was the relationship between the City planning department and the Public Works Department which was outlined within this section of the Transportation Element.

Transportation concerns were not mentioned in either the Recreation Element nor the Urbanization Elements within the Plan. An Energy Element was not included within the Plan.

A. *ZONING ORDINANCE*

The Baker City Zoning Ordinance (1979) includes reference to various modes and systems of transportation in the following land-use zones and provisions:

- Sec. 7.040 -Transportation elements required for PUD.
  (1)(b,d)
  (2)(d)

- Sec. 11.010 - Transportation terminal as a permitted use with Light
  (6) Industrial Zone.

- Art. 13 - Off-Street Parking Requirements.

- Sec. 14.030 - Clear Vision Requirements.

- Sec. 14.040 - Supplementary provisions and exceptions within Freeway and Campbell Street Development Zones.

- Sec. 16.110 - Transportation elements within City requirements and
  (5) conditions for consideration of proposed uses.

B. *SUBDIVISION ORDINANCE*

The Subdivision Ordinance for Baker City (1978) is incorporated into the Zoning Ordinance in Articles 7-12. The Subdivision requirements include reference to transportation systems in the following sections:

- Sec. 3.040 - Transportation elements required on Tentative Plat.
  (2)(a),(3)(a)

- Sec. 4.020-Transportation elements required on Final Plat.
  (2-5)

- Sec. 5.010-Requirements for the creation of a public street outside a subdivision.

- Sec. 5.020-Requirements for the creation of a private street outside a subdivision.

- Sec. 6.030-Design standards for streets.
  (1)

- Sec. 7.030-Requirements for street improvements within Subdivision.
  (1), (5) Including requirements for sidewalks to be added as part of street improvements.

5. CONFLICTS/DISCREPANCIES WITHIN BAKER COUNTY COMPREHENSIVE PLAN AND CODES, AND INADEQUACIES RELEVANT TO THE TRANSPORTATION PLANNING RULE (GOAL 12)

There are few conflicts between the Plan and the Codes. This is primarily because the both documents are rather comprehensive and complete. The Plan does set guidelines for bicycle facilities which do not seem to be reciprocated within the codes.

Both the Plan and the Codes need to address specific design standards for, sidewalks, bikeways, and other transportation facilities, in addition to requiring bicycle parking facilities and consideration of access and the connectivity of all applicable transportation modes within planned developments.

The following is a list of items needed within the Comprehensive Plan and the Codes to facilitate the Goal 12 process.

- Complete inventory of existing County transportation facilities (adequate sidewalks, bike ways, transit, street condition, particular problem areas, etc.).
- Further plans for bicycle and pedestrian modes (travel ways, parking facilities, recreational consideration).
- Consideration of setback requirements and smaller street widths to encourage slower traffic through population centers.
- Further discussion coordinating Federal, State, County, and local agencies to plan for future transportation systems that meet the needs of a variety of users.
- Drawings and design specifications for streets, sidewalks, and bicycle ways. These are notably absent from the Subdivision Ordinance.
- Discussion of access management and urban traffic control measures for motor vehicle, pedestrian, bicycle, and transit transportation.

The Following considerations do not apply to the Transportation Planning Goal, however, they are needed within the specified elements to complete the Comprehensive Plan.

- Consideration of alternative transportation modes and systems as a function of energy conservation (Goal 13). The Plans inventory of transportation pipelines is a strong beginning.
- Consideration of alternative transportation modes and systems as a function of recreation (Goal 7).

APPENDIX B - MAJOR STREETS INVENTORY

TABLE B
1995 MAJOR STREETS INVENTORY
Baker City Transportation Master Plan

Street Segment	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (ft)	Street Width (ft)	Travel Lanes	Curbs	On-Street Parking	Sidewalks	Bikeway (1)	Pavement Condition
Auburn Avenue											
17th Street to 13th Street	City	Collector	25		24.0	2	None	Yes	No	Shared	Very Good
2nd Street to Main Street	City	Collector	25		52.0	2	Type "C"	Yes	Yes	Shared	Fair
4th Street to 2nd Street	City	Collector	25		40.0	2	Type "C"	Yes	Yes	Shared	Fair
Oak Street to Chestnut Street	City	Collector	25		42.5	2	Type "A"	Yes	Yes	Shared	Good
Resort Street to Oak Street	City	Collector	25		38.0	2	Type "A"	Yes	Intermittent	Shared	Good
Rail Road to 4th Street	City	Collector	25		40.0	2	Type "A"	Yes	Yes	Shared	Good
13th Street to Rail Road	City	Collector	25		24.0	2	None	Yes	No	Shared	Very Good
Chestnut Street to Birch Street	City	Collector	25		42.5	2	Type "A"	Yes	No	Shared	Good
Birch Street											
D Street to H Street	City	Collector	25		34.5	2	None	Yes	No	Shared	Gravel
Auburn Avenue to Campbell Street	City	Collector	25		42.5	2	Type "A"	Yes	Intermittent	Shared	Good
Broadway Street											
17th Street to 13th Street	City	Collector	25		24.0	2	None	Yes	No	Shared	Very Good
12th Street to Rail Road	City	Collector	25		24.0	2	None	Yes	No	Shared	Very Good
Rail Road to 10th Street	City	Collector	25		52.0	2	Type "C"	Yes	No	Shared	Good
13th Street to 12th Street	City	Collector	25		24.0	2	None	Yes	No	Shared	Very Good
Campbell Street											
10th Street to Main Street	City	Collector	25		40.0	2	Type "C"	Yes	Yes	Shared	Good
17th Street to Rail Road	City	Collector	25		40.0	2	Type "C"	Yes	No	Shared	Good
18th Street to 17th Street	City	Collector	25		24.0	2	None	Yes	No	Shared	Good
City Limits to 18th Street	City	Collector	25		24.0	2	None	Yes	No	Shared	Good
Rail Road to 10th Street	City	Collector	25		40.0	2	Type "C"	Yes	Yes - N / Intermittent - S	Shared	Good
Cedar Street											
Campbell Street to Hughes Lane	City	Collector	25		24.0	2	None	Yes	No	Shared	Good
Church Street											
2nd Street to 1st Street	City	Collector	25		37.5	2	Type "C"	Yes	Yes	Shared	Good
4th Street to 2nd Street	City	Collector	25		30.0	2	Type "A"	Yes	Yes	Shared	Good
1st Street to Main Street	City	Residential	25		40.0	2	Type "A"	Yes	Yes	Shared	Good
Clark Street											
Auburn Avenue to Valley Avenue	City	Collector	25		40.0	2	Type "A"	Yes	Yes - W / Intermittent - E	Shared	Good
Spring Garden Avenue to Auburn Avenue	City	Collector	25		40.0	2	Type "A"	Yes	Intermittent	Shared	Good
Washington Avenue to Campbell Street	City	Collector	25		40.0	2	Type "A"	Yes	Intermittent	Shared	Good
Valley Avenue to Washington Avenue	City	Collector	25		40.0	2	Type "A"	Yes	Yes	Shared	Good
College Street											
Campbell Street to E Street	City	Collector	25		40.0	2	Type "A"	Yes	Yes	Shared	Good
E Street to G Street	City	Collector	25		40.0	2	Type "C"	Yes	Yes	Shared	Good

TABLE B
1995 MAJOR STREETS INVENTORY
Baker City Transportation Master Plan

Street Segment	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (ft)	Street Width (ft)	Travel Lanes	Curbs	On-Street Parking	Sidewalks	Bikeway (1)	Pavement Condition
G Street to H Street	City	Collector	25		38.5	2	Type "A"	Yes	Intermittent	Shared	Good
Colorado Street											
Oregon Highway 7 to 2nd Street	City	Collector	25		36.0	2	Type "A"	Yes	Intermittent	Shared	Very Good
Court Street											
2nd Street to Main Street	City	Collector	25		52.0	2	Type "C"	Yes	Yes	Shared	Fair
3rd Street to 2nd Street	City	Collector	25		52.0	2	Type "C"	Yes	Yes	Shared	Good
D Street											
10th Street to 9th Street	City	Collector	25		42.5	2	Type "A"	Yes	Intermittent	Shared	Very Good
9th Street to 8th Street	City	Collector	25		42.5	2	Type "A"	Yes	Intermittent	Shared	Very Good
Cedar Street to Birch Street	City	Collector	25		34.5	2	None	Yes	No	Shared	Gravel
Clark Street to Cedar Street	City	Collector	25		34.5	2	None	Yes	No	Shared	Gravel
College Street to Main Street	City	Collector	25		40.0	2	Type "A"	Yes	No	Shared	Good
Rail Road to 12th Street	City	Collector	25		34.5	2	None	Yes	No	Shared	Gravel
East Street to Clark Street	City	Collector	25		34.5	2	None	Yes	No	Shared	Gravel
Grove Street to Elm Street	City	Collector	25		34.5	2	Type "A"	Yes	No	Shared	Good
12th Street to 11th Street	City	Collector	25		42.5	2	Type "A"	Yes	No	Shared	Very Good
11th Street to 10th Street	City	Collector	25		42.5	2	Type "A"	Yes	No	Shared	Good
6th Street to College Street	City	Collector	25		42.5	2	Type "A"	Yes	No	Shared	Very Good
8th Street to 6th Street	City	Collector	25		42.5	2	Type "A"	Yes	No	Shared	Very Good
Walnut Street to Grove Street	City	Collector	25		34.5	2	Type "A"	Yes	No	Shared	Good
David Eccles Road											
2nd Street to Oregon Highway 7	City	Collector	25		24.0	2	None	Yes	Intermittent	Shared	Good
Oregon Highway 7 to 2nd Street	City	Collector	25		24.0	2	None	Yes	No	Shared	Gravel
East Street											
Campbell Street to D Street	City	Collector	25		24.0	2	None	Yes	No	Shared	Very Good
D Street to H Street	City	Collector	25		34.5	2	None	Yes	No	Shared	Gravel
Estes Street											
4th Street to 1st Street	City	Collector	25		34.5	2	Type "A"	Yes	Yes	Shared	Good
Dewey Avenue to River Drive	City	Collector	25		30.0	2	Type "C"	Yes	Yes	Shared	Good
River Drive to Elm Street	City	Collector	25		38.0	2	Type "C"	Yes	Yes	Shared	Good
5th Street											
Dewey Avenue to Myrtle Street	City	Collector	25		24.0	2	Type "A"	Yes	No	Shared	Good
1st Street											
Broadway Avenue to Chruch Street	City	Collector	25		50.5	2	Type "A"	Yes	Yes	Shared	Good
Dewey Avenue to Auburn Avenue	City	Collector	25		52.0	2	Type "A"	Yes	Yes	Shared	Good
Auburn Avenue to Broadway Avenue	City	Collector	25		52.0	2	Type "C"	Yes	Yes	Shared	Good

TABLE B
1995 MAJOR STREETS INVENTORY
Baker City Transportation Master Plan

Street Segment	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (ft)	Street Width (ft)	Travel Lanes	Curbs	On-Street Parking	Sidewalks	Bikeway (1)	Pavement Condition
4th Street											
Auburn Avenue to Valley Avenue	City	Collector	25		42.5	2	Type "A"	Yes	Yes	Shared	Very Good
Broadway Avenue to Campbell Street	City	Collector	25		40.0	2	Type "A"	Yes	Yes	Shared	Good
Grace Street to Auburn Avenue	City	Collector	25		42.5	2	Type "A"	Yes	Yes	Shared	Good
Valley Avenue to Washington Avenue	City	Collector	25		42.5	2	Type "A"	Yes	Yes	Shared	Very Good
Washington Avenue to Broadway Avenue	City	Collector	25		48.5	2	Type "A"	Yes	Yes	Shared	Very Good
Grace Street											
4th Street to 3rd Street	City	Collector	25		32.0	2	Type "C"	Yes	Yes	Shared	Good
Elm Street to South Bridge Street	City	Collector	25		42.5	2	Type "A"	Yes	Yes - S	Shared	Good
Grove Street											
Campbell Street to F Street	City	Collector	25		42.5	2	Type "A"	Yes	Yes - E / Intermittent - W	Shared	Good
F Street to H Street	City	Collector	25		42.5	2	Type "A"	Yes	No	Shared	Good
H Street											
17th Street to 10th Street	City	Collector	25		24.0	2	None	Yes	No	Shared	Very Good
Cedar Street to Birch Street	City	Collector	25		34.5	2	Type "A"	Yes	No	Shared	Good
Grove Street to Cedar Street	City	Collector	25		34.5	2	None	Yes	No	Shared	Gravel
Hughes Lane											
U.S. Highway 30 to Cedar Street	County	Collector	25			2	None	Yes	No	Shared	
Indiana Avenue											
11th Street to Hillcrest Drive	City	Collector	25		40.0	2	Type "C"	Yes	No	Shared	Very Good
City Limits to 11th Street	City	Collector	25		24.0	2	None	Yes	No	Shared	Gravel
Foothill Drive to Oregon Highway 7	City	Collector	25		42.5	2	Type "A"	Yes	No	Shared	Very Good
Hillcrest Circle to Foothill Drive	City	Collector	25		32.0	2	Type "A"	Yes	No	Shared	Very Good
Hillcrest Drive to Hillcrest Circle	City	Collector	25		24.0	2	Type "C"	Yes	No	Shared	Good
Main Street											
B Street to C Street	City	Collector	25		57.0	2	Type "A"	Yes	Yes	Shared	Good
C Street to D Street	City	Collector	25		37.0	2	Type "A"	Yes	No	Shared	Good
Campbell Street to B Street	City	Collector	25		60.0	2	Type "C"	Yes	Yes	Shared	Good
Myrtle Street											
Dewey Avenue to River Drive	City	Collector	25		29.0	2	Type "C"	Yes	Yes	Shared	Good
Elm Street to South Bridge Street	City	Collector	25		34.5	2	Type "A"	Yes	No	Shared	Fair
10th Street to 5th Street	City	Collector	25		24.0	2	None	Yes	No	Shared	Good
Main Street to Elm Street	City	Collector	25		34.5	2	Type "A"	Yes	Yes	Shared	Good
River Drive to Main Street	City	Collector	25		29.0	2	Type "C"	Yes	Yes	Shared	Good
Place Street											

TABLE B
1995 MAJOR STREETS INVENTORY
Baker City Transportation Master Plan

Street Segment	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (ft)	Street Width (ft)	Travel Lanes	Curbs	On-Street Parking	Sidewalks	Bikeway (1)	Pavement Condition
1st Street to Dewey Avenue	City	Collector	25		52.5	2	Type "A"	Yes	Yes	Shared	Good
1st Street to 2nd Street	City	Residential	25		52.5	2	Type "A"	Yes	Yes	Shared	Good
Pocahontas Road											
Rail Road to U.S. Highway 30	City	Collector	25		44.0	3	None	Yes	No	Shared	Good
Reservoir Road											
Grace Street to Indiana Avenue	City	Residential	25		24.0	2	None	Yes	No	Shared	Gravel
Resort Street											
Bridge Street to Washington Avenue	City	Collector	25		60.0	2	Type "C"	Yes	Yes	Shared	Good
Madison Street to Campbell Street	City	Collector	25		60.0	2	Type "C"	Yes	Yes - E / Intermittent - W	Shared	Good
Washington Avenue to Madison Street	City	Collector	25		60.0	2	Type "C"	Yes	Yes - E / Intermittent - W	Shared	Good
2nd Street											
Auburn Avenue to Broadway Street	City	Collector	25		50.5	2	Type "A"	Yes	Yes	Shared	Good
Broadway Street to Church Street	City	Collector	25		40.0	2	Type "C"	Yes	Yes	Shared	Fair
Dewey Avenue to Place Street	City	Collector	25		42.5	2	Type "A"	Yes	Yes	Shared	Good
Place Street to Auburn Avenue	City	Collector	25		50.5	2	Type "A"	Yes	Yes	Shared	Good
17th Street											
Auburn Avenue to B Street	City	Collector	25		24.0	2	None	Yes	No	Shared	Good
Grace Street to Auburn Avenue	City	Collector	25		24.0	2	None	Yes	No	Shared	Good
B Street to Pocahontas Road	City	Collector	25		26.0	2	None	Yes	No	Shared	Good
South Bridge Street											
Cemetery Gate to Grace Street	City	Collector	25		42.5	2	Type "A"	Yes	No	Shared	Fair
U.S. Highway 30 to Cemetery Gate	City	Collector	25		24.0	2	None	Yes	No	Shared	Good
Spring Garden Avenue											
Elm Street to Clark Place	City	Collector	25		37.0	2	Type "A"	Yes	Yes - N / No - S	Shared	Good
10th Street											
Myrtle Street to Auburn Avenue	City	Collector	25		24.0	2	None	Yes	No	Shared	Good
3rd Street											
Broadway Avenue to Baker Street	City	Collector	25		40.0	2	Type "C"	Yes	Yes	Shared	Fair
Court Street to Broadway Avenue	City	Collector	25		52.0	2	Type "C"	Yes	Yes	Shared	Good
Dewey Avenue to Grace Street	City	Residential	25		30.0	2	Type "C"	Yes	Yes	Shared	Very Good
Valley Avenue											
2nd Street to Main Street	City	Collector	25		52.0	2	Type "C"	Yes	Yes	Shared	Fair

TABLE B
1995 MAJOR STREETS INVENTORY
Baker City Transportation Master Plan

Street Segment	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (ft)	Street Width (ft)	Travel Lanes	Curbs	On-Street Parking	Sidewalks	Bikeway (1)	Pavement Condition
Washington Avenue											
Main Street to Resort Street	City	Collector	25		52.5	2	Type "A"	Yes	Yes	Shared	Very Good
Balm Street to Birch Street	City	Collector	25		42.5	2	Type "A"	Yes	Intermittent	Shared	Fair
Resort Street to River Drive	City	Collector	25		46.5	2	Type "A"	Yes	Yes	Shared	Good
River Drive to Balm Street	City	Collector	25		40.0	2	Type "C"	Yes	Yes	Shared	Good
Oregon Highway 7											
City Limits to 4th Street	State	Arterial	45			2	None	Yes	No	Shared	
Dewey Avenue											
4th Street to Bridge Street	State	Arterial	25			2		Yes	Yes	Shared	
Main Street											
Bridge Street to Campbell Street	State	Arterial	25			4		Yes	Yes	Shared	
Campbell Street											
Main Street to I-84	State	Arterial	30			4		Yes	Intermittent	Shared	
Bridge Street											
Auburn Avenue to Spring Garden Avenue	State	Arterial	25			2		Yes	Yes	Shared	
Elm Street											
Spring Garden Avenue to Indiana Avenue	State	Arterial	25 - 35			2		Yes	Yes	Shared	
U.S. Highway 30											
Indiana Avenue to City Limits	State	Arterial	45 - 55 ?			2		Yes	No	Shared	
H Street to City Limits	State	Arterial	35			4		Yes	No	Shared	
Broadway Avenue											
Main Street to 10th Street	State	Arterial	30			4		Yes	Yes	Shared	
10th Street											
Broadway Avenue to H Street	State	Arterial	30			4		Yes	Intermittent	Shared	

APPENDIX C - DEMOGRAPHIC FORECAST

Baker City, Oregon

Transportation System Plan

Demographic Forecast

Prepared for:

City of Baker City, Oregon
1655 First Street
P.O. Box 650
Baker City, Oregon 97814

September 28, 1995

I. INTRODUCTION

This report summarizes the methods and assumptions used by David Evans and Associates, Inc. (DEA) to estimate current population, housing, and employment in Baker City and to forecast these demographics for the year 2015. The demographic data, presented in Tables 1, 2, and 3, were prepared for use in a computer transportation model, TModel 2, which uses housing, employment, and transportation data to determine future transportation needs. Identified needs then will be utilized to prepare the City of Baker City's Transportation System Plan (TSP).

The study area for the TSP is defined by the City's Urban Growth Boundary (UGB). The map included with this report shows the study area boundary.

II. BASE CASE ESTIMATES AND METHODOLOGY

To begin the demographic work, DEA divided the study area into 48 transportation analysis zones (TAZs). Dividing the area into zones enables the computer model to analyze traffic movements between localized areas. TAZ boundaries typically are based on land use, major streets, topography, and natural features. All population and employment estimates for existing (base case) and forecast conditions are divided according to the appropriate TAZs to enable the computer to track demographic change for different portions of the city.

Population and Housing

DEA's calculations result in an estimated 1995 population of 9,608 for the study area. The number of dwelling units in the study area is estimated at 4,279, of which 3,636 (85 percent) are single-family homes (including mobile homes) and 643 (15 percent) are multi-family units. Population and housing figures are presented in Table 1.

To estimate current population and housing, DEA relied upon 1990 US Census data at the census block level. Block data, the smallest division of census data, contain information on population, race, age, dwelling units, etc. Block data were aggregated into study area TAZs to get the 1990 demographic information for each TAZ and the total study area.

Actual population and housing counts for specific census blocks are available only for every 10-year US Census. Therefore, it was necessary to estimate existing population and housing for each TAZ in the study area. Current (1995) population and housing statistics were estimated by calculating an average annual growth rate using 1990 census data and estimated 1994 data from the Center for Population Research and Census at Portland State University. Using this short-term growth rate (approximately 0.8 percent) DEA calculated initial estimates of 1995 population and housing for each TAZ in the study area.

TABLE OF CONTENTS

LIST OF TABLES

Table 1
Existing and Projected Housing and Population
Baker City Study Area

TAZ	1990 Total du	1990 SF du	1990 MF du	1990 Pop.	1995 estimate Total du	1995 estimate SF du	1995 estimate MF du	1995 estimate Pop.	2015 projection Total du	2015 projection SF du	2015 projection MF du	2015 projection Pop.
1	61	61	0	148	63	63	0	154	83	83	0	200
2	94	86	8	246	108	100	8	270	167	139	28	387
3	235	225	10	583	245	234	10	607	276	255	21	652
4	74	68	6	180	77	71	6	187	116	97	19	270
5	126	114	12	283	131	119	12	295	131	119	12	308
6	20	16	4	47	21	17	4	49	31	21	10	70
7	147	129	18	353	153	133	20	367	184	154	30	428
8	216	175	41	463	253	180	73	531	253	180	73	571
9	81	67	14	176	84	71	13	183	96	79	17	222
10	194	176	18	398	202	182	20	414	202	182	20	475
11	85	62	23	400	88	65	23	416	88	65	23	201
12	54	54	0	115	56	56	0	120	62	60	2	149
13	156	156	0	352	162	162	0	366	194	183	11	460
14	7	7	0	20	7	7	0	21	7	7	0	17
15	9	9	0	26	9	9	0	27	9	9	0	22
16	214	190	24	519	223	197	26	540	262	214	48	605
17	108	100	8	203	112	104	8	211	112	104	8	266
18	84	70	14	218	87	71	16	227	87	71	16	202
19	29	21	8	60	30	22	8	62	30	22	8	68
20	182	128	54	330	189	130	59	343	189	130	59	425
21	44	35	9	75	46	36	9	78	46	36	9	105
22	44	17	27	44	46	17	29	46	46	17	29	95
23	4	1	3	4	4	1	3	4	4	1	3	8
24	1	1	0	1	1	1	0	1	1	1	0	2
25	65	52	13	118	68	52	16	123	68	52	16	155
26	37	28	9	78	39	28	11	81	39	28	11	87
27	93	87	6	187	97	91	6	195	97	91	6	229
28	78	65	13	190	81	65	16	198	81	65	16	187
29	104	80	24	249	108	84	24	259	108	84	24	248
30	97	76	21	205	101	80	21	213	122	95	27	279
31	78	60	18	161	81	63	18	168	81	63	18	186
32	102	98	4	220	106	102	4	229	106	102	4	253
33	0	0	0	0	0	0	0	0	8	4	4	18
34	158	119	39	283	164	124	41	295	175	128	47	397
35	165	150	15	376	172	157	15	391	172	157	15	405
36	15	9	6	39	16	9	6	41	16	9	6	34
37	205	175	30	412	213	177	36	429	224	182	42	516
38	179	158	21	417	186	165	21	434	186	165	21	436
39	31	31	0	92	32	32	0	96	32	32	0	77
40	75	68	7	185	78	71	7	193	104	82	22	239
41	65	56	9	159	74	65	9	184	126	118	9	298
42	141	101	40	248	147	105	42	258	265	156	109	581
43	38	38	0	87	40	40	0	91	85	85	0	205
44	66	66	0	191	69	69	0	199	95	95	0	228
45	3	3	0	5	3	3	0	5	3	3	0	7
46	5	5	0	8	5	5	0	8	5	5	0	12
47	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0	0
Total	4,069	3,493	576	9,154	4,279	3,636	643	9,608	4,879	4,032	846	11,286

du = dwelling unit SF = single-family
Pop. = population MF = multi-family

The TAZs in the study area have grown at different rates over the past five years. While population/housing growth has remained constant in some areas of the City, it has been increasing in other parts over the same time period. Therefore, DEA assumed that the 0.8 percent average annual growth rate represents the residential infill that has occurred throughout the study area. DEA contacted the City planner, Tim Collins, to identify areas that have experienced notable recent development (i.e., more than just a house or two within a TAZ). In many cases, Mr. Collins was able to identify the actual number of units constructed in recent residential developments. These units were added to the appropriate TAZs.

The number of single- and multi-family housing units were estimated by calculating the ratio of each to total housing units in 1990 for each TAZ, then applying these same ratios to the 1995 estimates of total dwelling units. Additional population related to these dwelling units was estimated by assuming 2.5 persons per each new single-family dwelling unit, and 2.1 persons per each new multi-family unit. When this population is added to the initial 1995 estimate, the resulting five-year average annual growth rate is close to one percent (0.97 percent).

Employment

According to DEA's estimates, Baker City currently has an average of 4,156 non-agricultural jobs in the TSP study area. Employment estimates by type of work are shown in Table 2.

The State of Oregon publishes employment statistics for Baker County as a whole, but not for Baker City, so DEA had to obtain employment information using other means. In addition, because employment data needed to be specific to the study area for computer analysis, it was necessary to estimate employment located in each TAZ. Therefore, DEA obtained employment information through document research and telephone interviews. Sources included the Baker City Chamber of Commerce, the Oregon Employment Department, and many businesses and agencies located in the study area. Employers were identified from Chamber of Commerce lists and from the local Yellow Pages.

The 1995 population-to-employment ratio in the study area is 2.3 to 1. In most urban areas, the ratio usually falls between 2.1 and 3.0. Lower ratios occur where almost all employment is contained within an urban area and is based primarily in manufacturing, commercial, and service industries. Higher ratios occur where many jobs in an area are resource-based, e.g., in agriculture, forestry, mineral extraction, etc.; where a large number of employees commute to work in other areas; or where unemployment is high.

Table 2
1995 Employment Estimates
Baker City Study Area

TAZ	Total	Commercial	Office	Industrial	Medical	Government	School	Students
1	2	2						
2	4	4						
3	67	14	1	48			4	20
4	270	28		220			22	249
5	11	7	2	2				
6	89	21	11	19			38	441
7	101	31	24	46				
8	119	102	6	6	3		2	10
9	89	50	1	35	3			
10	83	42	8	2			31	371
11	862	156	25	82	275	324		
12	80	15	1				64	654
13	42	14	3	25				
14	195	19		176				
15	45	25	10	10				
16	18	16		2				
17	3			3				
18	37			5			32	361
19	78	9		3		66		
20	212	5	13	3		191		
21	86	3	26		5	52		
22	215	156	54		5			
23	57	20	14			23		
24	87	12	74		1			
25	32	10	7		15			
26	55	30	20		2		3	20
27	7	7						
28	0							
29	2		2					
30	29	20		9				
31	1			1				
32	0							
33	33		33					
34	108	85	21		2			
35	3			3				
36	0							
37	417	139	46	5		8	219	349
38	190	173	8	9				
39	105	94		11				
40	72	22	30		2	18		
41	209	205				4		
42	2		2					
43	9	4	5					
44	1	1						
45	4		1	3				
46	25	21		4				
47	0							
48	0							
Total	4,156	1,562	448	732	313	686	415	2,475

Total Employment within Study Area = 4,156

Baker City's population-to-employment ratio reflects that most residents work within the city. This is due, in part, to the fact that Baker City is the largest city in the county and therefore is the primary source of many services, such as health and education. It is also the retail hub of the area, and increasing tourism creates additional demand for lodging, restaurants, etc.) Although many people are employed in commercial (including retail and services such as restaurants, motels, etc.), a significant number work for government agencies (see Table 2). Because Baker City is the county seat, it has both county and city government employees. In addition, the US Forest Service Supervisor's office is located in the city.

IV. FORECAST

Population and Housing

Population and housing counts were forecast to the year 2015 to meet the 20-year planning outlook of the TSP. The projected 2015 population for Baker City was calculated to be 11,286, using the 1995 estimate as a base with an average annual growth rate of 0.8 percent. This rate is the same as that used by Portland State University in its 2010 projection for the city (calculated as a 20-year rate, from 1990 to 2010). Although recent growth in Baker City has been slightly higher, a lower rate is often used over the long term to take slow-growth periods into account. For example, Baker City's population grew by about 120 people between 1970 and 1980, but declined by more than 330 people between 1980 and 1990, for a net decline over those 20 years. It is difficult to predict how population will change over the next 20 years, but historic trends indicate a relatively low growth rate.

Future population and housing growth will be concentrated in the TAZs most able to accommodate it. Many TAZs in the study area, especially those in and near downtown, are largely developed and will accommodate only infill or replacement units. Some TAZs near the edges of the study area, however, contain substantial amounts of vacant buildable land designated for residential use and can accommodate the majority of Baker City's expected growth.

The overall population estimate, based on 0.8 percent annual growth, provided a guideline for assigning growth within each TAZ. However, the amount and type (single- or multi-family) of future residential development in each TAZ will vary, depending on such factors as anticipated residential densities that will occur on available land, development constraints, and recent development trends. Future development was assigned based on the amount of vacant buildable land in each TAZ and an evaluation of these factors.

DEA began by estimating the amount of vacant buildable land in each TAZ using the City's Comprehensive Plan maps and information on recently developed areas obtained from the City planner. Not all of the available land will develop within 20 years. TAZs were assigned residential development based on development constraints (slopes, flood plains, etc.) and on recent development trends. In accordance with state planning goals, DEA also assumed that development would occur first in TAZs closer to the city center and in areas currently being developed. To reach the 2015 projected population for the study area (determined using an annual growth rate, as described above), DEA assumed that outlying TAZs would not be developed to capacity in 20 years.

For example, TAZs 3, 40, and 41 are close to the city center, are experiencing new development, and still have several acres of vacant land zoned for residential use. These TAZs were assumed to be built out by 2015. The City's Comprehensive Plan identifies the area which can be served with domestic water. The City does not plan to extend water service outside of that area. Therefore, land lying outside this area was not assigned any additional growth. In addition, areas lying on steep slopes were assigned very little growth, and areas lying within the 100-year flood plain were assigned residential growth at less-than-average densities. Available land in outlying TAZs was assumed to develop to 10, 25, or 50 percent of capacity, depending upon such development constraints and proximity to existing development.

The table below summarizes DEA's density assumptions for future residential development. DEA assumed that land designated as low-density residential (R-LD) will develop at approximately 3.5 dwelling units per acre (du/acre). Only single-family dwellings are allowed on land with this designation. Land designated as medium-density residential (R-MD) is expected to develop with both single- and multi-family (i.e., duplex) units. DEA assumed that approximately 80 percent of the R-MD land will develop with single-family units at 3.5 per acre, and 20 percent will develop with duplexes at 7 units per acre. The City has also designated high-density residential (R-HD) areas, some of which still contain vacant buildable land. These areas typically have smaller residential lots. Single-family (approximately 60 percent of vacant R-HD land) was assumed to develop at 5 units per acre; multi-family (the remaining 40 percent of R-HD) was assumed to develop at 10 units per acre. The R-HD designation allows development of apartment complexes in addition to duplexes and tri-plexes.

Land Use Designation	Percentage of Buildable Land as Single- or Multi-Family	Density
R-LD (low-density residential)	100% SF	3.5 du/acre
R-MD (medium-density residential)	80% SF	3.5 du/acre
	20% MF	7 du/acre
R-HD (high-density residential)	60% SF	5 du/acre
	50% MF	10 du/acre

Additional dwelling units, as determined using the methods just described, were then added to 1995 estimated dwelling units to determine 2015 totals. Under these assumptions, the study area would contain a total of 4,879 dwelling units. Of these, 4,032 (83 percent) would be single-family dwellings, and 846 (17 percent) would be multi-family dwelling units.

Population for each TAZ was estimated using expected average household sizes. The 1990 average household size in the study area was approximately 2.3 persons per household. For the 2015 projection, single-family units were assumed to contain 2.4 persons per household, and multi-family units to contain 2.1 persons per household. This results in an overall household size of approximately 2.3, similar to current household size.

Table 1 indicates the number of housing units and population projected for each TAZ. The total population is 11,286, which is in accordance with the population estimate based on an average annual growth rate of 0.8 percent and with Portland State University's 2010 population projection. Based on the assumptions in this report, the expected population can be accommodated easily within the existing UGB by 2015.

Employment

The employment forecast for the TSP is not intended to be a full-sector (agricultural and non-agricultural) forecast. The projections do not include agricultural jobs because the TSP is for facilities and improvements within the study area, and agricultural-related trips have only minor impacts on traffic patterns in the study area. The 2015 employment forecast, with a total employment of 4,884, is shown in Table 3.

Future employment is more difficult to predict than population. It is influenced by the local and national economies, upon availability of resources, upon population trends, etc. The employment projection prepared for the TSP is fairly simple and is based on several assumptions, including the City's own employment projections, existing development, the growing importance of tourism to Baker City's economy, and employment's relation to population.

Overall employment is forecast to grow in proportion to the population, a total increase of 17.5 percent, or 727 new jobs, over the next 20 years. Indicators show Baker City's economy to be relatively healthy, and expect it to remain so. Because DEA assumed employment would increase proportional to population, the population-to-employment ratio will be the same in 2015 as in 1995: 2.3 to 1.

Medical, government, and school employment is also assumed to grow 17.5 percent throughout the city. In downtown Baker City (TAZs 18, 19, and 21-24), all other employment is assumed to increase at a rate of 10 percent. Employment growth in the downtown is predicted to be 10 percent, because the area is already built out and the historic district designation may constrain development. Office employment growth should vary by location, 10 percent growth downtown and between 15 and 21 percent growth in other appropriately zoned TAZs, resulting in overall office employment growth of 17.5 percent.

Table 3
Projected Employment (2015)
Baker City Study Area

TAZ	Total	Commercial	Office	Industrial	Medical	Government	School	Students
1	2	2						
2	5	5						
3	77	16	1	54			5	24
4	307	32		249			26	293
5	13	8	2	2				
6	104	24	13	21			45	518
7	116	36	28	52				
8	137	117	7	7	4		2	12
9	102	58	1	40	4			
10	96	48	10	2			36	436
11	1,009	179	29	97	323	381		
12	93	17	1				75	768
13	49	16	4	30				
14	232	23		209				
15	52	29	12	11				
16	21	18		2				
17	3			3				
18	43			6			38	424
19	91	10		3		78		
20	249	6	15	3		224		
21	109	3	29		6	72		
22	237	172	59		6			
23	64	22	15			27		
24	96	13	81		1			
25	37	12	8		18			
26	64	35	24		2		4	24
27	8	8						
28	0							
29	2		2					
30	33	23		10				
31	1			1				
32	0							
33	39		39					
34	122	98	25					
35	3			3				
36	0							
37	486	160	54	6		9	257	410
38	229	209	9	10				
39	126	114		12				
40	84	25	35		2	21		
41	253	248				5		
42	2		2					
43	10	5	6					
44	1	1						
45	26	22	1	3				
46	29	24		5				
47	0							
48	21	21						
Total	4,884	1,859	514	842	365	817	488	2,909

Total Employment within Study Area = 4,884

The region's economy appears to be shifting from resource-based industries to tourism-related industries. Due to this shift, industrial employment will likely increase at a slower rate than other types of employment. For this study, industrial jobs were assumed to increase by 15 percent. Areas targeted in the Comprehensive Plan for industrial development are assumed to absorb the majority of this growth. These sites have advantages of large parcel size, rail access, proximity to industrial uses, flat topography, and fringe location. Therefore, targeted TAZs 11, 13, and 14 were assigned 18 percent of the projected industrial employment. Downtown is assumed to receive 10 percent growth, and the rest of the city is projected to receive 13 percent.

Commercial employment is predicted to increase by 19 percent overall. This high growth rate reflects the shift from resource-based industries to tourism. Tourism-related employment is predominately commercial and includes retail businesses as well as services such as restaurants, motels, and auto service stations. The employment increase also takes into account a study in the Baker City & Baker County 1993/1994 Community Profile projecting high retail activity in the city. DEA assumed that growth would concentrate in areas identified by the City's Comprehensive Plan as ripe for commercial development. These areas were likely identified by the City due to their being largely undeveloped and near I-84 and other important transportation routes. Thus, targeted TAZs 14, 38, 39, 41, and 44 are projected to receive a 21 percent increase; TAZs 45 and 48 are predicted to receive new employment, and the rest of the TAZs (excluding downtown) are predicted to receive 13 percent growth. As stated earlier, growth in downtown will be limited due to the lack of available commercial sites.

V. CONCLUSIONS AND LIMITATIONS OF THE DATA

Assuming current trends continue, Baker City will experience moderate population and employment growth over the next 20 years. According to the estimates, there is enough buildable residential land within the UGB to accommodate the expected growth.

The city's economy is relatively healthy. Employment growth is expected to keep pace with population growth, as more residents will demand goods and services and tourism continues.

This study was prepared to estimate current conditions and expected growth patterns which will be used in a computer model to determine future transportation needs. The amount of growth, and where it occurs, will affect traffic and transportation facilities in the study area. It should be noted that the study area was defined specifically for use with the computer model and that this demographic analysis was designed specifically for use in developing Baker City's TSP. This report is not intended to provide an accurate economic forecast or housing analysis, and it should not be used for any purpose other than that for which it was designed.

CBKR0001\bakrldemo.doc

APPENDIX D - BAKER CITY TRANSPORTATION SURVEY

CONTENTS

INTRODUCTION

This book contains the results of a survey of Baker City residents. It was conducted by Moore Information, Incorporated, an independent, public opinion research company located in Portland, Oregon.

Sample. A total of 200 interviews was conducted. In order to ensure a representative sample, potential households were systematically selected from a sample frame of city residents and within each household, probability sampling methods were used to select respondents.

Data Collection and Processing. The interviews were conducted between 5:00 PM and 9:00 PM January 9, 1995 by Moore Information personnel working from the company's phone bank in Portland, Oregon. Ten percent of each interviewer's work was monitored while in process or verified by Moore Information supervisory personnel. All data entry work was 100% verified.

Sampling Error. Readers of this book should be aware that surveys are designed to measure public opinion at a specific point in time, within defined statistical limits. This survey should not be used as a prediction of future public opinion or action.

Every sample is subject to ranges of variability, usually called sampling error. Sampling error refers to the difference between results obtained and the results that would have been obtained if every resident of the area had been interviewed. The table below illustrates the maximum sampling error at different percentages of response.

Response Percentage	50 Segment	100 Segment	200 Segment
10% or 90%	8%	6%	4%
20% or 80%	11%	8%	6%
30% or 70%	13%	9%	6%
40% or 60%	14%	10%	7%
50%	14%	10%	7%

Sampling error is computed at the 95% confidence level. This means if the survey were repeated 100 times, in 95 of those cases the question response would not vary more than the sampling error. For purposes of determining statistical significance between two responses, the percentage difference must be greater than the sum of the sampling error from both responses.

BAKER CITY (N=200)
January 9, 1995

Hello, this is _______ of Moore Information, a public opinion research firm. Today we are conducting a survey among people who live in Baker City. Could I please speak to a member of the household who is 18 or older? IF NA SCHEDULE CALLBACK.

Do you live in Baker City? TERMINATE IF NO

This survey is authorized by the city of Baker City. It is part of a transportation system planning effort being conducted by the city.

Could you spend a few minutes on the phone to discuss transportation issues in Baker City?

1. First, in your opinion, what is the biggest transportation problem facing people in Baker City? (DON'T READ)

1.	Inadequate public transit/For elderly	16%
2.	Lack of adequate traffic signals/Stop signs	10%
3.	Traffic/Congestion	5%
4.	Bad road conditions/Narrow roads	3%
5.	Snow build up from plowing/Icy roads	3%
6.	Lack of local airport	3%
7.	Inconsiderate drivers/Bad drivers	2%
8.	Parking	2%
9.	Lack of taxis	2%
10.	Baker City not centralized enough	1%
11.	Lack of bicycle lanes/Pedestrian access	1%
12.	Cut backs in Amtrak service	1%
13.	Lack of street lights	1%
14.	Bad management of transportation issues by city	1%
15.	Bad street planning	1%
16.	Tourism	1%
17.	Cost of gas	1%
18.	Too many traffic signals	1%
19.	Lack of money	1%
20.	Nothing/No problems	17%
21.	Don't know	32%

2. Next, where do you usually shop for groceries, pharmacy needs and other convenience items, (ROTATE 1-3)

1.	Safeway/Campbell Street	51%
2.	Albertson's	41%
3.	Wilson's/Big "V"	5%
4.	LaGrande	2%
5.	Walmart	1%
6.	Don't know	1%

3. How long does it take for you to get to (ANSWER IN #2)?

1.	less than five minutes	49%
2.	5-9 minutes	29%
3.	10-15 minutes	15%
4.	more than 15 minutes	6%
5.	(DON'T READ) don't know	2%

4. Thinking about today only, how many trips were taken by people in your household to buy groceries, pharmacy needs or other convenience items? (RECORD NUMBER 1-6, 7= 7 OR MORE TRIPS, 8=D.K.)

1.	One	37%
2.	Two	10%
3.	Three	3%
4.	Four	2%
5.	None	47%
6.	Don't know	3%

5. Where do you usually shop for variety, clothing or other non-grocery items? (ROTATE 1-5)

1.	Big "V"	31%
2.	LaGrande	17%
3.	Downtown	16%
4.	Boise	12%
5.	Mail order	9%
6.	Elsewhere in Baker City	8%
7.	Campbell Street	3%
8.	Portland	1%
9.	Ontario	1%
10.	Don't know	5%

6. How long does it take for you to get to (ANSWER IN #5)?

1.	less than five minutes	15%
2.	5-9 minutes	27%
3.	10-15 minutes	17%
4.	more than 15 minutes	40%
5.	(DON'T READ) don't know	1%

7. Thinking about today only, how many trips were taken by people in your household to buy variety, clothing or other non-grocery items? (RECORD NUMBER 1-6, 7=7 OR MORE TRIPS, 8=D.K.)

1.	One	12%
2.	Two	2%
3.	Three	1%
4.	None	82%
5.	Don't know	3%

8. How many people in your household are currently employed part time or full time? (RECORD NUMBER 1-5, 6= SIX OR MORE, 7=D.K.)

1.	One	30%
2.	Two	38%
3.	Three	7%
4.	Four	2%
5.	None	24%

9-11. Where do the employed members of your household work? (ASK FOR ALL EMPLOYED PERSONS, READ 1-4)

1.	Downtown	35%
2.	Elsewhere in Baker City	31%
3.	West of 10th Street	18%
4.	Campbell Street	8%
5.	Various locations/Traveling	2%
6.	North Powder	1%
7.	Pendleton	*
8.	Haines	*
9.	LaGrande	*
10.	Don't know	3%

12-14. How long does it take for each person in your household to get to their workplace?

1.	less than five minutes	43%
2.	5-9 minutes	30%
3.	10-15 minutes	12%
4.	more than 15 minutes	12%
5.	(DON'T READ) don't know	4%

15. Thinking about today only, how many work-related trips by auto were taken by people in your household? (RECORD NUMBER 1-6, 7=7 OR MORE TRIPS, 8=D.K.)

1.	One	24%
2.	Two	23%
3.	Three	8%
4.	Four	8%
5.	Five	1%
6.	Six	3%
7.	None	33%
8.	Don't know	3%

16. How many other trips by auto were made by people in your household today, including trips to school, recreation, to a restaurant, personal business, etc. ? (RECORD NUMBER 1-6, 7=7 OR MORE TRIPS, 8=D.K.)

1.	One	24%
2.	Two	20%
3.	Three	10%
4.	Four	5%
5.	Five	4%
6.	Six	2%
7.	Seven or more	2%
8.	None	33%
9.	Don't know	4%

Now a few questions for statistical purposes.

17. Are you a full time or part time resident of Baker City?

1.	full time	99%

IF PART-TIME: How many months a year do you live in Baker City?

2.	three months	1%

18. What is your approximate age please? (READ 1-3, 3-1)

1.	18-34	20%
2.	35-54	42%
3.	55 or older	37%
4.	(DON'T READ) NA	2%

19. Which of the following categories includes your annual household income? (READ 1-7, 7-1)

1.	less than $10,000	12%
2.	$10,000-$19,999	11%
3.	$20,000-$29,999	18%
4.	$30,000-$39,999	21%
5.	$40,000-$49,999	9%
6.	$50,000-$74,999	12%
7.	$75,000 or more	4%
8.	(DON'T READ) NA	15%

20. How many people currently reside in your household? (RECORD NUMBER 1-5, 6=6 OR MORE, DK=7)

1.	One	14%
2.	Two	41%
3.	Three	18%
4.	Four	18%
5.	Five	7%
6.	Six or more	2%
7.	Don't know	1%

21. How many cars or trucks are owned by people in your household? (RECORD NUMBER 1-5, 6=6 OR MORE, DK=7)

1.	One	16%
2.	Two	46%
3.	Three	21%
4.	Four	8%
5.	Five	2%
6.	Six or more	3%
7.	None	4%
8.	Don't know	2%

22. Do you live in a, (READ 1-4, 4-1)

1.	single family home,	91%
2.	apartment,	4%
3.	condominium, or	1%
4.	mobile home/trailer?	5%

23. Gender (BY OBSERVATION)

1.	male	49%
2.	female	51%

1. IN YOUR OPINION WHAT IS THE BIGGEST TRANSPOR. PROBLEM IN BAKER CITY?		TOTAL	23. GENDER		18. AGE			19.1 HOUSEHOLD INCOME		20.1 PEOPLE RESIDING IN YOUR HOME				21.1 CARS/ TRUCKS IN YOUR HOUSHOLD				22. H.H. DWELLING	
			male	fem.	18-34	35-54	55+	<30K	30K+	1	2	3	4+	1	2	3	4+	single fam.	misc
bad mng. of transportat.	#	2	1	1		2			2		2				2			2	
	ROW %	100%	50%	50%		100%			100%		100%				100%			100%	
	COL %	1%	1%	1%		2%			2%		2%				2%			1%	
bad street planning	#	2	2		1		1	1			1		1		1		1	2	
	ROW %	100%	100%		50%		50%	50%			50%		50%		50%		50%	100%	
	COL %	1%	2%		3%		1%	1%			1%		2%		1%		4%	1%	
cut backs in Amtrack	#	1	1				1		1		1			1				1	
	ROW %	100%	100%				100%		100%		100%			100%				100%	
	COL %	1%	1%				1%		1%		1%			3%				1%	
not central-ized enough	#	1	1				1	1			1				1			1	
	ROW %	100%	100%				100%	100%			100%				100%			100%	
	COL %	1%	1%				1%	1%			1%				1%			1%	
tourism	#	1		1	1								1			1			1
	ROW %	100%		100%	100%								100%			100%			100%
	COL %	1%		1%	3%								2%			2%			5%
cost of gas	#	1	1				1		1		1				1			1	
	ROW %	100%	100%				100%		100%		100%				100%			100%	
	COL %	1%	1%				1%		1%		1%				1%			1%	
too many traffic sgn.	#	1	1				1	1			1				1			1	
	ROW %	100%	100%				100%	100%			100%				100%			100%	
	COL %	1%	1%				1%	1%			1%				1%			1%	
lack of money	#	1	1				1	1		1							1	1	
	ROW %	100%	100%				100%	100%		100%							100%	100%	
	COL %	1%	1%				1%	1%		4%							4%	1%	
none	#	33	17	16	4	16	13	12	16	2	13	5	13	2	16	8	7	33	
	ROW %	100%	52%	49%	12%	49%	39%	36%	49%	6%	39%	15%	39%	6%	49%	24%	21%	100%	
	COL %	17%	17%	16%	10%	19%	18%	15%	18%	7%	16%	14%	25%	7%	17%	20%	28%	18%	
dont know	#	64	28	36	17	19	27	24	28	13	25	12	14	12	34	8	6	58	6
	ROW %	100%	44%	56%	27%	30%	42%	38%	44%	20%	39%	19%	22%	19%	53%	13%	9%	91%	9%
	COL %	32%	29%	35%	43%	23%	37%	30%	32%	46%	31%	33%	26%	39%	37%	20%	24%	32%	32%
TOTAL	#	200	98	102	40	84	73	81	89	28	82	36	53	31	92	41	25	181	19
	ROW %	100%	49%	51%	20%	42%	37%	41%	45%	14%	41%	18%	27%	16%	46%	21%	13%	91%	10%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

BAKER CITY OREGON, JANUARY 1995

1. IN YOUR OPINION WHAT IS THE BIGGEST TRANSPOR. PROBLEM IN BAKER CITY?		TOTAL	23. GENDER		18. AGE			19.1 HOUSEHOLD INCOME		20.1 PEOPLE RESIDING IN YOUR HOME				21.1 CARS/ TRUCKS IN YOUR HOUSHOLD				22. H.H. DWELLING	
			male	fem.	18-34	35-54	55+	<30K	30K+	1	2	3	4+	1	2	3	4+	sin-gle fam.	misc
inadequate pub. transit	#	32	14	18	6	17	9	13	14	4	15	6	6	6	10	8	3	28	4
	ROW %	100%	44%	56%	19%	53%	28%	41%	44%	13%	47%	19%	19%	19%	31%	25%	9%	88%	13%
	COL %	16%	14%	18%	15%	20%	12%	16%	16%	14%	18%	17%	11%	19%	11%	20%	12%	16%	21%
lack of traf fic signals	#	20	9	11	6	8	5	11	6	3	7	4	6	4	10	5	1	17	3
	ROW %	100%	45%	55%	30%	40%	25%	55%	30%	15%	35%	20%	30%	20%	50%	25%	5%	85%	15%
	COL %	10%	9%	11%	15%	10%	7%	14%	7%	11%	9%	11%	11%	13%	11%	12%	4%	9%	16%
traffic congestion	#	10	7	3	1	5	3	4	5	1	4	2	3	2	2	5	1	8	2
	ROW %	100%	70%	30%	10%	50%	30%	40%	50%	10%	40%	20%	30%	20%	20%	50%	10%	80%	20%
	COL %	5%	7%	3%	3%	6%	4%	5%	6%	4%	5%	6%	6%	7%	2%	12%	4%	4%	11%
bad road conditions	#	6	2	4	1	3	2	2	3		2		4		3	3		5	1
	ROW %	100%	33%	67%	17%	50%	33%	33%	50%		33%		67%		50%	50%		83%	17%
	COL %	3%	2%	4%	3%	4%	3%	3%	3%		2%		8%		3%	7%		3%	5%
icy roads	#	6	4	2	1	4	1	4	2	1	1	2	2	1	3	1	1	6	
	ROW %	100%	67%	33%	17%	67%	17%	67%	33%	17%	17%	33%	33%	17%	50%	17%	17%	100%	
	COL %	3%	4%	2%	3%	5%	1%	5%	2%	4%	1%	6%	4%	3%	3%	2%	4%	3%	
lack of loc-al airport	#	5	2	3	1	2	2	1	4	1	2	1	1	2	2		1	5	
	ROW %	100%	40%	60%	20%	40%	40%	20%	80%	20%	40%	20%	20%	40%	40%		20%	100%	
	COL %	3%	2%	3%	3%	2%	3%	1%	5%	4%	2%	3%	2%	7%	2%		4%	3%	
lack of taxis	#	4	2	2		3	1	4		1	1	2		1		1	1	3	1
	ROW %	100%	50%	50%		75%	25%	100%		25%	25%	50%		25%		25%	25%	75%	25%
	COL %	2%	2%	2%		4%	1%	5%		4%	1%	6%		3%		2%	4%	2%	5%
bad drivers	#	3		3		1	2	1	1	1	1		1		2			3	
	ROW %	100%		100%		33%	67%	33%	33%	33%	33%		33%		67%			100%	
	COL %	2%		3%		1%	3%	1%	1%	4%	1%		2%		2%			2%	
parking	#	3	2	1	1	2		1	2		1	2			1	1	1	2	1
	ROW %	100%	67%	33%	33%	67%		33%	67%		33%	67%			33%	33%	33%	67%	33%
	COL %	2%	2%	1%	3%	2%		1%	2%		1%	6%			1%	2%	4%	1%	5%
lack of str. lights	#	2	1	1		1	1		2		2				1		1	2	
	ROW %	100%	50%	50%		50%	50%		100%		100%				50%		50%	100%	
	COL %	1%	1%	1%		1%	1%		2%		2%				1%		4%	1%	
lack of bike lanes	#	2	2			1	1		2		1		1		2			2	
	ROW %	100%	100%			50%	50%		100%		50%		50%		100%			100%	
	COL %	1%	2%			1%	1%		2%		1%		2%		2%			1%	

2. WHERE DO YOU USUALLY SHOP FOR GROCERIES, PHARMACY, CONVENIENCE ITEMS		TOTAL	3. HOW LONG DOES IT TAKE FOR YOU TO GET TO....? <5 min.	5-9 min.	10-15 min.	>15 min.	dont know	4. HOW MANY TRIPS WERE TAKEN TO BUY GROCERIES, PHARMACY, CONVENIENCE ITEMS? 1	2	3	4	dont know	none
Albertson's	#	81	37	28	13	3		35	8	2	1	2	33
	ROW %	100%	46%	35%	16%	4%		43%	10%	3%	1%	3%	41%
	COL %	41%	38%	48%	43%	25%		47%	42%	40%	33%	40%	35%
Safeway/ Campbell St.	#	102	59	24	14	4	1	34	10	3	2	3	50
	ROW %	100%	58%	24%	14%	4%	1%	33%	10%	3%	2%	3%	49%
	COL %	51%	61%	41%	47%	33%	33%	46%	53%	60%	67%	60%	53%
Wilson's/Big "V"	#	10	1	6	3			2					8
	ROW %	100%	10%	60%	30%			20%					80%
	COL %	5%	1%	10%	10%			3%					9%
La Grande	#	4				4		1	1				2
	ROW %	100%				100%		25%	25%				50%
	COL %	2%				33%		1%	5%				2%
Wallmart	#	1				1		1					
	ROW %	100%				100%		100%					
	COL %	1%				8%		1%					
dont know	#	2					2	1					1
	ROW %	100%					100%	50%					50%
	COL %	1%					67%	1%					1%
TOTAL	#	200	97	58	30	12	3	74	19	5	3	5	94
	ROW %	100%	49%	29%	15%	6%	2%	37%	10%	3%	2%	3%	47%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

2. WHERE DO YOU USUALLY SHOP FOR GROCERIES, PHARMACY, CONVENIENCE ITEMS		TOTAL	23. GENDER		18. AGE			19.1 HOUSEHOLD INCOME		20.1 PEOPLE RESIDING IN YOUR HOME				21.1 CARS/ TRUCKS IN YOUR HOUSHOLD				22. H.H. DWELLING	
			male	fem.	18-34	35-54	55+	<30K	30K+	1	2	3	4+	1	2	3	4+	sin-gle fam.	misc
Albertson's	#	81	40	41	12	41	27	32	37	10	31	16	23	10	37	13	14	75	6
	ROW %	100%	49%	51%	15%	51%	33%	40%	46%	12%	38%	20%	28%	12%	46%	16%	17%	93%	7%
	COL %	41%	41%	40%	30%	49%	37%	40%	42%	36%	38%	44%	43%	32%	40%	32%	56%	41%	32%
Safeway/ Campbell St.	#	102	50	52	25	36	40	43	46	16	45	17	24	18	47	24	10	91	11
	ROW %	100%	49%	51%	25%	35%	39%	42%	45%	16%	44%	17%	24%	18%	46%	24%	10%	89%	11%
	COL %	51%	51%	51%	63%	43%	55%	53%	52%	57%	55%	47%	45%	58%	51%	59%	40%	50%	58%
Wilson's/Big "V"	#	10	5	5		4	5	3	3	1	5	2	2	3	4	2		9	1
	ROW %	100%	50%	50%		40%	50%	30%	30%	10%	50%	20%	20%	30%	40%	20%		90%	10%
	COL %	5%	5%	5%		5%	7%	4%	3%	4%	6%	6%	4%	10%	4%	5%		5%	5%
La Grande	#	4	2	2	3	1		3	1			1	3		2	1	1	4	
	ROW %	100%	50%	50%	75%	25%		75%	25%			25%	75%		50%	25%	25%	100%	
	COL %	2%	2%	2%	8%	1%		4%	1%			3%	6%		2%	2%	4%	2%	
Wallmart	#	1		1		1			1		1					1			1
	ROW %	100%		100%		100%			100%		100%					100%			100%
	COL %	1%		1%		1%			1%		1%					2%			5%
dont know	#	2	1	1		1	1		1	1			1		2			2	
	ROW %	100%	50%	50%		50%	50%		50%	50%			50%		100%			100%	
	COL %	1%	1%	1%		1%	1%		1%	4%			2%		2%			1%	
TOTAL	#	200	98	102	40	84	73	81	89	28	82	36	53	31	92	41	25	181	19
	ROW %	100%	49%	51%	20%	42%	37%	41%	45%	14%	41%	18%	27%	16%	46%	21%	13%	91%	10%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

3. HOW LONG DOES IT TAKE FOR YOU TO GET TO....?		TOTAL	23. GENDER		18. AGE			19.1 HOUSEHOLD INCOME		20.1 PEOPLE RESIDING IN YOUR HOME				21.1 CARS/ TRUCKS IN YOUR HOUSHOLD				22. H.H. DWELLING	
			male	fem.	18-34	35-54	55+	<30K	30K+	1	2	3	4+	1	2	3	4+	single fam.	misc
less than 5 minutes	#	97	51	46	20	47	30	35	51	11	40	17	29	11	48	24	12	93	4
	ROW %	100%	53%	47%	21%	49%	31%	36%	53%	11%	41%	18%	30%	11%	50%	25%	12%	96%	4%
	COL %	49%	52%	45%	50%	56%	41%	43%	57%	39%	49%	47%	55%	36%	52%	59%	48%	51%	21%
5-9 minutes	#	58	29	29	6	27	23	29	22	7	25	12	14	12	26	9	9	53	5
	ROW %	100%	50%	50%	10%	47%	40%	50%	38%	12%	43%	21%	24%	21%	45%	16%	16%	91%	9%
	COL %	29%	30%	28%	15%	32%	32%	36%	25%	25%	31%	33%	26%	39%	28%	22%	36%	29%	26%
10-15 minutes	#	30	13	17	10	6	13	11	10	7	13	5	5	7	12	6	2	22	8
	ROW %	100%	43%	57%	33%	20%	43%	37%	33%	23%	43%	17%	17%	23%	40%	20%	7%	73%	27%
	COL %	15%	13%	17%	25%	7%	18%	14%	11%	25%	16%	14%	9%	23%	13%	15%	8%	12%	42%
more than 15 minutes	#	12	4	8	4	3	5	5	5	2	4	1	4	1	3	2	2	10	2
	ROW %	100%	33%	67%	33%	25%	42%	42%	42%	17%	33%	8%	33%	8%	25%	17%	17%	83%	17%
	COL %	6%	4%	8%	10%	4%	7%	6%	6%	7%	5%	3%	8%	3%	3%	5%	8%	6%	11%
dont know	#	3	1	2		1	2	1	1	1		1	1		3			3	
	ROW %	100%	33%	67%		33%	67%	33%	33%	33%		33%	33%		100%			100%	
	COL %	2%	1%	2%		1%	3%	1%	1%	4%		3%	2%		3%			2%	
TOTAL	#	200	98	102	40	84	73	81	89	28	82	36	53	31	92	41	25	181	19
	ROW %	100%	49%	51%	20%	42%	37%	41%	45%	14%	41%	18%	27%	16%	46%	21%	13%	91%	10%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

4. HOW MANY TRIPS WERE TAKEN TO BUY GROCERIES, PHARMACY, CONVENIENCE ITEMS?		TOTAL	23. GENDER male	fem.	18. AGE 18-34	35-54	55+	19.1 HOUSEHOLD INCOME <30K	30K+	20.1 PEOPLE RESIDING IN YOUR HOME 1	2	3	4+	21.1 CARS/ TRUCKS IN YOUR HOUSHOLD 1	2	3	4+	22. H.H. DWELLING sin- gle fam.	misc
one	#	74	38	36	17	35	22	29	36	4	28	17	25	5	36	20	12	66	8
	ROW %	100%	51%	49%	23%	47%	30%	39%	49%	5%	38%	23%	34%	7%	49%	27%	16%	89%	11%
	COL %	37%	39%	35%	43%	42%	30%	36%	40%	14%	34%	47%	47%	16%	39%	49%	48%	37%	42%
two	#	19	10	9	9	6	4	7	10	1	7	5	6		13	3	2	16	3
	ROW %	100%	53%	47%	47%	32%	21%	37%	53%	5%	37%	26%	32%		68%	16%	11%	84%	16%
	COL %	10%	10%	9%	23%	7%	6%	9%	11%	4%	9%	14%	11%		14%	7%	8%	9%	16%
three	#	5	3	2	1	4		4	1		1		4	2	1	2		5	
	ROW %	100%	60%	40%	20%	80%		80%	20%		20%		80%	40%	20%	40%		100%	
	COL %	3%	3%	2%	3%	5%		5%	1%		1%		8%	7%	1%	5%		3%	
four	#	3	3		1		2	2	1		3				2		1	3	
	ROW %	100%	100%		33%		67%	67%	33%		100%				67%		33%	100%	
	COL %	2%	3%		3%		3%	3%	1%		4%				2%		4%	2%	
dont know	#	5	2	3	1	1	3	2	2	1	3	1		2	1	1		5	
	ROW %	100%	40%	60%	20%	20%	60%	40%	40%	20%	60%	20%		40%	20%	20%		100%	
	COL %	3%	2%	3%	3%	1%	4%	3%	2%	4%	4%	3%		7%	1%	2%		3%	
none	#	94	42	52	11	38	42	37	39	22	40	13	18	22	39	15	10	86	8
	ROW %	100%	45%	55%	12%	40%	45%	39%	42%	23%	43%	14%	19%	23%	42%	16%	11%	92%	9%
	COL %	47%	43%	51%	28%	45%	58%	46%	44%	79%	49%	36%	34%	71%	42%	37%	40%	48%	42%
TOTAL	#	200	98	102	40	84	73	81	89	28	82	36	53	31	92	41	25	181	19
	ROW %	100%	49%	51%	20%	42%	37%	41%	45%	14%	41%	18%	27%	16%	46%	21%	13%	91%	10%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

5. WHERE DO YOU USUALLY SHOP FOR VARIETY, CLOTHING, NON-GROCERY ITEMS?		TOTAL	6. HOW LONG DOES IT TAKE FOR YOU TO GET TO....? <5 min.	5-9 min.	10-15 min.	>15 min.	dont know	7. HOW MANY TRIPS WERE TAKEN TO BUY VARIETY, CLOTHING, NON-GROCERY ITEMS? 1	2	3	dont know	none
downtown	#	31	16	8	7			4	1	1	2	23
	ROW %	100%	52%	26%	23%			13%	3%	3%	7%	74%
	COL %	18%	62%	17%	24%			17%	25%	50%	33%	14%
Campbell Street	#	5		4	1			2				3
	ROW %	100%		80%	20%			40%				60%
	COL %	3%		8%	3%			8%				2%
Big "V"	#	62	9	29	19	5		9		1	2	50
	ROW %	100%	15%	47%	31%	8%		15%		2%	3%	81%
	COL %	36%	35%	60%	66%	7%		38%		50%	33%	31%
elsewhere in Baker City	#	16	1	5	2	8		2	1			13
	ROW %	100%	6%	31%	13%	50%		13%	6%			81%
	COL %	9%	4%	10%	7%	12%		8%	25%			8%
Boise	#	23		1		21	1	3			1	19
	ROW %	100%		4%		91%	4%	13%			4%	83%
	COL %	13%		2%		30%	50%	13%			17%	12%
La Grande	#	33		1		31	1	1	2			30
	ROW %	100%		3%		94%	3%	3%	6%			91%
	COL %	19%		2%		45%	50%	4%	50%			18%
Portland	#	2				2						2
	ROW %	100%				100%						100%
	COL %	1%				3%						1%
Ontario	#	2				2		1				1
	ROW %	100%				100%		50%				50%
	COL %	1%				3%		4%				1%
TOTAL	#	174	26	48	29	69	2	24	4	2	6	163
	ROW %	100%	15%	28%	17%	40%	1%	14%	2%	1%	3%	94%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

5. WHERE DO YOU USUALLY SHOP FOR VARIETY, CLOTHING, NON-GROCERY ITEMS?		TOTAL	23. GENDER		18. AGE			19.1 HOUSEHOLD INCOME		20.1 PEOPLE RESIDING IN YOUR HOME				21.1 CARS/ TRUCKS IN YOUR HOUSHOLD				22. H.H. DWELLING	
			male	fem.	18-34	35-54	55+	<30K	30K+	1	2	3	4+	1	2	3	4+	single fam.	misc
downtown	#	31	17	14	3	17	11	11	16	4	13	6	8	5	13	6	4	27	4
	ROW %	100%	55%	45%	10%	55%	36%	36%	52%	13%	42%	19%	26%	16%	42%	19%	13%	87%	13%
	COL %	16%	17%	14%	8%	20%	15%	14%	18%	14%	16%	17%	15%	16%	14%	15%	16%	15%	21%
Campbell Street	#	5	1	4		4		3		1		1	3	1	1	2	1	4	1
	ROW %	100%	20%	80%		80%		60%		20%		20%	60%	20%	20%	40%	20%	80%	20%
	COL %	3%	1%	4%		5%		4%		4%		3%	6%	3%	1%	5%	4%	2%	5%
Big "V"	#	62	30	32	6	24	31	27	21	13	25	9	14	14	29	10	3	58	4
	ROW %	100%	48%	52%	10%	39%	50%	44%	34%	21%	40%	15%	23%	23%	47%	16%	5%	94%	7%
	COL %	31%	31%	31%	15%	29%	43%	33%	24%	46%	31%	25%	26%	45%	32%	24%	12%	32%	21%
elsewhere in Baker City	#	16	5	11	5	7	4	7	8	2	5	4	5	2	10	1	3	15	1
	ROW %	100%	31%	69%	31%	44%	25%	44%	50%	13%	31%	25%	31%	13%	63%	6%	19%	94%	6%
	COL %	8%	5%	11%	13%	8%	6%	9%	9%	7%	6%	11%	9%	7%	11%	2%	12%	8%	5%
mail order	#	16	7	9	2	6	8	8	6	3	11	1	1	3	5	5	2	14	2
	ROW %	100%	44%	56%	13%	38%	50%	50%	38%	19%	69%	6%	6%	19%	31%	31%	13%	88%	13%
	COL %	8%	7%	9%	5%	7%	11%	10%	7%	11%	13%	3%	2%	10%	5%	12%	8%	8%	11%
Boise	#	23	13	10	10	7	6	8	12	2	9	4	8	2	11	6	4	22	1
	ROW %	100%	57%	44%	44%	30%	26%	35%	52%	9%	39%	17%	35%	9%	48%	26%	17%	96%	4%
	COL %	12%	13%	10%	25%	8%	8%	10%	14%	7%	11%	11%	15%	7%	12%	15%	16%	12%	5%
La Grande	#	33	15	18	12	13	7	13	18	2	12	8	11	3	15	9	5	28	5
	ROW %	100%	46%	55%	36%	39%	21%	39%	55%	6%	36%	24%	33%	9%	46%	27%	15%	85%	15%
	COL %	17%	15%	18%	30%	16%	10%	16%	20%	7%	15%	22%	21%	10%	16%	22%	20%	16%	26%
Portland	#	2	2		1	1		1	1		1	1			2			2	
	ROW %	100%	100%		50%	50%		50%	50%		50%	50%			100%			100%	
	COL %	1%	2%		3%	1%		1%	1%		1%	3%			2%			1%	
Ontario	#	2		2		1	1	2			2			1	1			1	1
	ROW %	100%		100%		50%	50%	100%			100%			50%	50%			50%	50%
	COL %	1%		2%		1%	1%	3%			2%			3%	1%			1%	5%
dont know	#	10	8	2	1	4	5	1	7	1	4	2	3		5	2	3	10	
	ROW %	100%	80%	20%	10%	40%	50%	10%	70%	10%	40%	20%	30%		50%	20%	30%	100%	
	COL %	5%	8%	2%	3%	5%	7%	1%	8%	4%	5%	6%	6%		5%	5%	12%	6%	
TOTAL	#	200	98	102	40	84	73	81	89	28	82	36	53	31	92	41	25	181	19
	ROW %	100%	49%	51%	20%	42%	37%	41%	45%	14%	41%	18%	27%	16%	46%	21%	13%	91%	10%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

7. HOW MANY TRIPS WERE TAKEN TO BUY VARIETY, CLOTHING, NON-GROCERY ITEMS?		TOTAL	23. GENDER male	23. GENDER fem.	18. AGE 18-34	18. AGE 35-54	18. AGE 55+	19.1 HOUSEHOLD INCOME <30K	19.1 HOUSEHOLD INCOME 30K+	20.1 PEOPLE RESIDING IN YOUR HOME 1	20.1 PEOPLE RESIDING IN YOUR HOME 2	20.1 PEOPLE RESIDING IN YOUR HOME 3	20.1 PEOPLE RESIDING IN YOUR HOME 4+	21.1 CARS/ TRUCKS IN YOUR HOUSHOLD 1	21.1 CARS/ TRUCKS IN YOUR HOUSHOLD 2	21.1 CARS/ TRUCKS IN YOUR HOUSHOLD 3	21.1 CARS/ TRUCKS IN YOUR HOUSHOLD 4+	22. H.H. DWELLING sin-gle fam.	22. H.H. DWELLING misc
one	#	24	11	13	3	13	7	12	10	4	13	4	3	5	11	3	5	21	3
	ROW %	100%	46%	54%	13%	54%	29%	50%	42%	17%	54%	17%	13%	21%	46%	13%	21%	88%	13%
	COL %	12%	11%	13%	8%	16%	10%	15%	11%	14%	16%	11%	6%	16%	12%	7%	20%	12%	16%
two	#	4	2	2	2	2		1	3		2		2		2	2		4	
	ROW %	100%	50%	50%	50%	50%		25%	75%		50%		50%		50%	50%		100%	
	COL %	2%	2%	2%	5%	2%		1%	3%		2%		4%		2%	5%		2%	
three	#	2	1	1		2		1	1				2	1		1		2	
	ROW %	100%	50%	50%		100%		50%	50%				100%	50%		50%		100%	
	COL %	1%	1%	1%		2%		1%	1%				4%	3%		2%		1%	
dont know	#	6	4	2	1	1	4	1	3	2	3	1		1	2	1		6	
	ROW %	100%	67%	33%	17%	17%	67%	17%	50%	33%	50%	17%		17%	33%	17%		100%	
	COL %	3%	4%	2%	3%	1%	6%	1%	3%	7%	4%	3%		3%	2%	2%		3%	
none	#	164	80	84	34	66	62	66	72	22	64	31	46	24	77	34	20	148	16
	ROW %	100%	49%	51%	21%	40%	38%	40%	44%	13%	39%	19%	28%	15%	47%	21%	12%	90%	10%
	COL %	82%	82%	82%	85%	79%	85%	82%	81%	79%	78%	86%	87%	77%	84%	83%	80%	82%	84%
TOTAL	#	200	98	102	40	84	73	81	89	28	82	36	53	31	92	41	25	181	19
	ROW %	100%	49%	51%	20%	42%	37%	41%	45%	14%	41%	18%	27%	16%	46%	21%	13%	91%	10%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

6. HOW LONG DOES IT TAKE FOR YOU TO GET TO....?		TOTAL	23. GENDER		18. AGE			19.1 HOUSEHOLD INCOME		20.1 PEOPLE RESIDING IN YOUR HOME				21.1 CARS/ TRUCKS IN YOUR HOUSHOLD				22. H.H. DWELLING	
			male	fem.	18-34	35-54	55+	<30K	30K+	1	2	3	4+	1	2	3	4+	sin- gle fam.	misc
less than 5 minutes	#	26	16	10	2	11	13	10	14	4	12	6	4	2	12	7	2	24	2
	ROW %	100%	62%	39%	8%	42%	50%	39%	54%	15%	46%	23%	15%	8%	46%	27%	8%	92%	8%
	COL %	15%	19%	11%	5%	15%	22%	14%	18%	17%	18%	18%	8%	7%	15%	21%	10%	15%	12%
5-9 minutes	#	48	24	24	7	26	13	24	17	9	15	8	16	10	24	7	5	43	5
	ROW %	100%	50%	50%	15%	54%	27%	50%	35%	19%	31%	17%	33%	21%	50%	15%	10%	90%	10%
	COL %	28%	29%	26%	19%	35%	22%	33%	22%	38%	22%	24%	33%	36%	29%	21%	25%	27%	29%
10-15 minutes	#	29	10	19	4	12	13	11	9	6	10	4	9	7	12	5	2	26	3
	ROW %	100%	35%	66%	14%	41%	45%	38%	31%	21%	35%	14%	31%	24%	41%	17%	7%	90%	10%
	COL %	17%	12%	21%	11%	16%	22%	15%	12%	25%	15%	12%	18%	25%	15%	15%	10%	17%	18%
more than 15 minutes	#	69	32	37	24	24	20	26	35	4	30	14	20	9	34	14	10	62	7
	ROW %	100%	46%	54%	35%	35%	29%	38%	51%	6%	44%	20%	29%	13%	49%	20%	15%	90%	10%
	COL %	40%	39%	41%	65%	32%	33%	36%	46%	17%	45%	42%	41%	32%	42%	41%	50%	40%	41%
dont know	#	2	1	1		1	1	1	1	1		1				1	1	2	
	ROW %	100%	50%	50%		50%	50%	50%	50%	50%		50%				50%	50%	100%	
	COL %	1%	1%	1%		1%	2%	1%	1%	4%		3%				3%	5%	1%	
TOTAL	#	174	83	91	37	74	60	72	76	24	67	33	49	28	82	34	20	157	17
	ROW %	100%	48%	52%	21%	43%	35%	41%	44%	14%	39%	19%	28%	16%	47%	20%	12%	90%	10%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

9-11. WHERE DO THE EMPLOYED MEMBERS OF YOUR HOUSEHOLD WORK?		TOTAL	23. GENDER male	fem.	18. AGE 18-34	35-54	55+	19.1 HOUSEHOLD INCOME <30K	30K+	20.1 PEOPLE RESIDING IN YOUR HOME 1	2	3	4+	21.1 CARS/ TRUCKS IN YOUR HOUSHOLD 1	2	3	4+	22. H.H. DWELLING single fam.	misc
downdown	#	92	54	38	21	54	16	28	54	1	32	22	37	7	44	18	23	86	6
	ROW %	100%	59%	41%	23%	59%	17%	30%	59%	1%	35%	24%	40%	8%	48%	20%	25%	94%	7%
	COL %	61%	67%	54%	53%	68%	50%	50%	67%	8%	60%	67%	70%	47%	59%	50%	105%	62%	43%
west of 10th Street	#	46	26	20	11	27	8	22	20	3	12	10	21	4	19	18	5	43	3
	ROW %	100%	57%	44%	24%	59%	17%	48%	44%	7%	26%	22%	46%	9%	41%	39%	11%	94%	7%
	COL %	30%	32%	28%	28%	34%	25%	39%	25%	23%	23%	30%	40%	27%	25%	50%	23%	31%	21%
Campbell Street	#	22	11	11	11	11		6	13		4	5	13	1	9	8	4	21	1
	ROW %	100%	50%	50%	50%	50%		27%	59%		18%	23%	59%	5%	41%	36%	18%	96%	5%
	COL %	15%	14%	16%	28%	14%		11%	16%		8%	15%	25%	7%	12%	22%	18%	15%	7%
elsewhere in Baker City	#	82	42	40	22	45	15	22	52	5	28	22	27	5	41	19	13	75	7
	ROW %	100%	51%	49%	27%	55%	18%	27%	63%	6%	34%	27%	33%	6%	50%	23%	16%	92%	9%
	COL %	54%	52%	56%	55%	57%	47%	39%	64%	39%	53%	67%	51%	33%	55%	53%	59%	54%	50%
Pendleton	#	1		1		1			1		1				1			1	
	ROW %	100%		100%		100%			100%		100%				100%			100%	
	COL %	1%		1%		1%			1%		2%				1%			1%	
Haines	#	1	1			1		1					1			1		1	
	ROW %	100%	100%			100%		100%					100%			100%		100%	
	COL %	1%	1%			1%		2%					2%			3%		1%	
various	#	5	5		2	2	1	2	3	1	1	1	2		3	2		5	
	ROW %	100%	100%		40%	40%	20%	40%	60%	20%	20%	20%	40%		60%	40%		100%	
	COL %	3%	6%		5%	3%	3%	4%	4%	8%	2%	3%	4%		4%	6%		4%	
La Grande	#	1	1			1			1				1			1		1	
	ROW %	100%	100%			100%			100%				100%			100%		100%	
	COL %	1%	1%			1%			1%				2%			3%		1%	
North Powder	#	3	3			3		1	1				3		2	1		3	
	ROW %	100%	100%			100%		33%	33%				100%		67%	33%		100%	
	COL %	2%	4%			4%		2%	1%				6%		3%	3%		2%	
dont know	#	8	3	5	5	1	2	5	3	3	1		4	2	3	1	1	7	1
	ROW %	100%	38%	63%	63%	13%	25%	63%	38%	38%	13%		50%	25%	38%	13%	13%	88%	13%
	COL %	5%	4%	7%	13%	1%	6%	9%	4%	23%	2%		8%	13%	4%	3%	5%	5%	7%
TOTAL	#	261	81	71	40	79	32	56	81	13	53	33	53	15	75	36	22	138	14
	ROW %	100%	53%	47%	26%	52%	21%	37%	53%	9%	35%	22%	35%	10%	49%	24%	15%	91%	9%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

8. HOW MANY PEOPLE IN YOUR HOUSEHOLD ARE EMPLOYED PART TIME OR FULL TIME?		TOTAL	23. GENDER		18. AGE			19.1 HOUSEHOLD INCOME		20.1 PEOPLE RESIDING IN YOUR HOME				21.1 CARS/ TRUCKS IN YOUR HOUSHOLD				22. H.H. DWELLING	
			male	fem.	18-34	35-54	55+	<30K	30K+	1	2	3	4+	1	2	3	4+	sin-gle fam.	misc
one	#	60	27	33	12	24	23	33	22	13	28	12	7	13	31	10	3	50	10
	ROW %	100%	45%	55%	20%	40%	38%	55%	37%	22%	47%	20%	12%	22%	52%	17%	5%	83%	17%
	COL %	30%	28%	32%	30%	29%	32%	41%	25%	46%	34%	33%	13%	42%	34%	24%	12%	28%	53%
two	#	76	43	33	24	43	9	16	51		25	15	36	1	41	19	14	72	4
	ROW %	100%	57%	43%	32%	57%	12%	21%	67%		33%	20%	47%	1%	54%	25%	18%	95%	5%
	COL %	38%	44%	32%	60%	51%	12%	20%	57%		31%	42%	68%	3%	45%	46%	56%	40%	21%
three	#	13	9	4	3	10		4	8			6	7		3	7	3	13	
	ROW %	100%	69%	31%	23%	77%		31%	62%			46%	54%		23%	54%	23%	100%	
	COL %	7%	9%	4%	8%	12%		5%	9%			17%	13%		3%	17%	12%	7%	
four	#	3	2	1	1	2		3					3	1			2	3	
	ROW %	100%	67%	33%	33%	67%		100%					100%	33%			67%	100%	
	COL %	2%	2%	1%	3%	2%		4%					6%	3%			8%	2%	
none	#	48	17	31		5	41	25	8	15	29	3		16	17	5	3	43	5
	ROW %	100%	35%	65%		10%	85%	52%	17%	31%	60%	6%		33%	35%	10%	6%	90%	10%
	COL %	24%	17%	30%		6%	56%	31%	9%	54%	35%	8%		52%	19%	12%	12%	24%	26%
TOTAL	#	200	98	102	40	84	73	81	89	28	82	36	53	31	92	41	25	181	19
	ROW %	100%	49%	51%	20%	42%	37%	41%	45%	14%	41%	18%	27%	16%	46%	21%	13%	91%	10%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

12-14. HOW LONG DOES IT TAKE FOR EACH PERSON TO GET TO THEIR WORKPLACE?		TOTAL	23. GENDER		18. AGE			19.1 HOUSEHOLD INCOME		20.1 PEOPLE RESIDING IN YOUR HOME				21.1 CARS/ TRUCKS IN YOUR HOUSHOLD				22. H.H. DWELLING	
			male	fem.	18-34	35-54	55+	<30K	30K+	1	2	3	4+	1	2	3	4+	single fam.	misc
less than 5 minutes	#	111	63	48	40	52	19	37	64	3	44	29	35	6	49	33	21	105	6
	ROW %	100%	57%	43%	36%	47%	17%	33%	58%	3%	40%	26%	32%	5%	44%	30%	19%	95%	5%
	COL %	73%	78%	68%	100%	66%	59%	66%	79%	23%	83%	88%	66%	40%	65%	92%	96%	76%	43%
5-9 minutes	#	78	37	41	12	58	7	30	44	4	17	17	40	7	43	15	12	73	5
	ROW %	100%	47%	53%	15%	74%	9%	39%	56%	5%	22%	22%	51%	9%	55%	19%	15%	94%	6%
	COL %	51%	46%	58%	30%	73%	22%	54%	54%	31%	32%	52%	76%	47%	57%	42%	55%	53%	36%
10-15 minutes	#	31	18	13	6	15	10	9	14	3	8	9	11	4	14	8	4	28	3
	ROW %	100%	58%	42%	19%	48%	32%	29%	45%	10%	26%	29%	36%	13%	45%	26%	13%	90%	10%
	COL %	20%	22%	18%	15%	19%	31%	16%	17%	23%	15%	27%	21%	27%	19%	22%	18%	20%	21%
more than 15 minutes	#	31	22	9	10	17	4	5	22		9	5	17		13	12	6	28	3
	ROW %	100%	71%	29%	32%	55%	13%	16%	71%		29%	16%	55%		42%	39%	19%	90%	10%
	COL %	20%	27%	13%	25%	22%	13%	9%	27%		17%	15%	32%		17%	33%	27%	20%	21%
dont know	#	10	6	4	4	4	2	6	4	3	1		6	2	3	1	3	9	1
	ROW %	100%	60%	40%	40%	40%	20%	60%	40%	30%	10%		60%	20%	30%	10%	30%	90%	10%
	COL %	7%	7%	6%	10%	5%	6%	11%	5%	23%	2%		11%	13%	4%	3%	14%	7%	7%
TOTAL	#	261	81	71	40	79	32	56	81	13	53	33	53	15	75	36	22	138	14
	ROW %	100%	53%	47%	26%	52%	21%	37%	53%	9%	35%	22%	35%	10%	49%	24%	15%	91%	9%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

15. HOW MANY WORK-RELATED TRIPS BY AUTO WERE TAKEN TODAY?		TOTAL	23. GENDER		18. AGE			19.1 HOUSEHOLD INCOME		20.1 PEOPLE RESIDING IN YOUR HOME				21.1 CARS/ TRUCKS IN YOUR HOUSHOLD				22. H.H. DWELLING	
			male	fem.	18-34	35-54	55+	<30K	30K+	1	2	3	4+	1	2	3	4+	single fam.	misc
one	#	47	22	25	6	27	13	19	25	5	17	10	15	7	24	9	6	42	5
	ROW %	100%	47%	53%	13%	57%	28%	40%	53%	11%	36%	21%	32%	15%	51%	19%	13%	89%	11%
	COL %	24%	22%	25%	15%	32%	18%	24%	28%	18%	21%	28%	28%	23%	26%	22%	24%	23%	26%
two	#	45	27	18	14	24	7	11	30	1	15	12	17	1	23	12	9	42	3
	ROW %	100%	60%	40%	31%	53%	16%	24%	67%	2%	33%	27%	38%	2%	51%	27%	20%	93%	7%
	COL %	23%	28%	18%	35%	29%	10%	14%	34%	4%	18%	33%	32%	3%	25%	29%	36%	23%	16%
three	#	15	9	6	6	7	2	5	8		5	5	5		7	5	3	13	2
	ROW %	100%	60%	40%	40%	47%	13%	33%	53%		33%	33%	33%		47%	33%	20%	87%	13%
	COL %	8%	9%	6%	15%	8%	3%	6%	9%		6%	14%	9%		8%	12%	12%	7%	11%
four	#	15	9	6	4	9	2	7	6	2	3	3	7	1	7	4	3	14	1
	ROW %	100%	60%	40%	27%	60%	13%	47%	40%	13%	20%	20%	47%	7%	47%	27%	20%	93%	7%
	COL %	8%	9%	6%	10%	11%	3%	9%	7%	7%	4%	8%	13%	3%	8%	10%	12%	8%	5%
five	#	1	1			1			1		1				1			1	
	ROW %	100%	100%			100%			100%		100%				100%			100%	
	COL %	1%	1%			1%			1%		1%				1%			1%	
six	#	6	2	4	2	4		4	1		1		5		4	2		6	
	ROW %	100%	33%	67%	33%	67%		67%	17%		17%		83%		67%	33%		100%	
	COL %	3%	2%	4%	5%	5%		5%	1%		1%		9%		4%	5%		3%	
dont know	#	6	2	4	1	1	4	3	2	2	3		1	2	3			6	
	ROW %	100%	33%	67%	17%	17%	67%	50%	33%	33%	50%		17%	33%	50%			100%	
	COL %	3%	2%	4%	3%	1%	6%	4%	2%	7%	4%		2%	7%	3%			3%	
none	#	65	26	39	7	11	45	32	16	18	37	6	3	20	23	9	4	57	8
	ROW %	100%	40%	60%	11%	17%	69%	49%	25%	28%	57%	9%	5%	31%	35%	14%	6%	88%	12%
	COL %	33%	27%	38%	18%	13%	62%	40%	18%	64%	45%	17%	6%	65%	25%	22%	16%	32%	42%
TOTAL	#	200	98	102	40	84	73	81	89	28	82	36	53	31	92	41	25	181	19
	ROW %	100%	49%	51%	20%	42%	37%	41%	45%	14%	41%	18%	27%	16%	46%	21%	13%	91%	10%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

16. HOW MANY TRIPS BY AUTO WERE MADE TO SCHOOL, RECR., RESTAURANT, ETC.		TOTAL	23. GENDER		18. AGE			19.1 HOUSEHOLD INCOME		20.1 PEOPLE RESIDING IN YOUR HOME				21.1 CARS/ TRUCKS IN YOUR HOUSHOLD				22. H.H. DWELLING	
			male	fem.	18-34	35-54	55+	<30K	30K+	1	2	3	4+	1	2	3	4+	single fam.	misc
one	#	47	16	31	9	20	17	22	19	5	21	10	11	7	22	10	6	42	5
	ROW %	100%	34%	66%	19%	43%	36%	47%	40%	11%	45%	21%	23%	15%	47%	21%	13%	89%	11%
	COL %	24%	16%	30%	23%	24%	23%	27%	21%	18%	26%	28%	21%	23%	24%	24%	24%	23%	26%
two	#	39	21	18	9	19	11	14	22	4	14	6	14	4	22	8	4	36	3
	ROW %	100%	54%	46%	23%	49%	28%	36%	56%	10%	36%	15%	36%	10%	56%	21%	10%	92%	8%
	COL %	20%	21%	18%	23%	23%	15%	17%	25%	14%	17%	17%	26%	13%	24%	20%	16%	20%	16%
three	#	19	12	7	6	8	5	6	9		5	7	7	2	7	7	3	18	1
	ROW %	100%	63%	37%	32%	42%	26%	32%	47%		26%	37%	37%	11%	37%	37%	16%	95%	5%
	COL %	10%	12%	7%	15%	10%	7%	7%	10%		6%	19%	13%	7%	8%	17%	12%	10%	5%
four	#	9	3	6	3	5	1	2	7		3	1	5		4	2	3	9	
	ROW %	100%	33%	67%	33%	56%	11%	22%	78%		33%	11%	56%		44%	22%	33%	100%	
	COL %	5%	3%	6%	8%	6%	1%	3%	8%		4%	3%	9%		4%	5%	12%	5%	
five	#	7	4	3	2	4	1	3	3	1		2	4		4	1	2	7	
	ROW %	100%	57%	43%	29%	57%	14%	43%	43%	14%		29%	57%		57%	14%	29%	100%	
	COL %	4%	4%	3%	5%	5%	1%	4%	3%	4%		6%	8%		4%	2%	8%	4%	
six	#	3	1	2	1		2	1	2		2		1		3			3	
	ROW %	100%	33%	67%	33%		67%	33%	67%		67%		33%		100%			100%	
	COL %	2%	1%	2%	3%		3%	1%	2%		2%		2%		3%			2%	
seven or more	#	4	4		4			3	1		1		3		1	2	1	3	1
	ROW %	100%	100%		100%			75%	25%		25%		75%		25%	50%	25%	75%	25%
	COL %	2%	4%		10%			4%	1%		1%		6%		1%	5%	4%	2%	5%
dont know	#	7	3	4	1	2	4	3	2	2	3		2	2	3	1		7	
	ROW %	100%	43%	57%	14%	29%	57%	43%	29%	29%	43%		29%	29%	43%	14%		100%	
	COL %	4%	3%	4%	3%	2%	6%	4%	2%	7%	4%		4%	7%	3%	2%		4%	
none	#	65	34	31	5	26	32	27	24	16	33	10	6	16	26	10	6	56	9
	ROW %	100%	52%	48%	8%	40%	49%	42%	37%	25%	51%	15%	9%	25%	40%	15%	9%	86%	14%
	COL %	33%	35%	30%	13%	31%	44%	33%	27%	57%	40%	28%	11%	52%	28%	24%	24%	31%	47%
TOTAL	#	200	98	102	40	84	73	81	89	28	82	36	53	31	92	41	25	181	19
	ROW %	100%	49%	51%	20%	42%	37%	41%	45%	14%	41%	18%	27%	16%	46%	21%	13%	91%	10%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

17. ARE YOU A FULL TIME OR PART TIME RESIDENT OF BAKER CITY?		TOTAL	23. GENDER		18. AGE			19.1 HOUSEHOLD INCOME		20.1 PEOPLE RESIDING IN YOUR HOME				21.1 CARS/ TRUCKS IN YOUR HOUSHOLD				22. H.H. DWELLING	
			male	fem.	18-34	35-54	55+	<30K	30K+	1	2	3	4+	1	2	3	4+	sin-gle fam.	misc
full time	#	198	96	102	39	84	72	81	87	28	81	35	53	31	91	40	25	179	19
	ROW %	100%	49%	52%	20%	42%	36%	41%	44%	14%	41%	18%	27%	16%	46%	20%	13%	90%	10%
	COL %	99%	98%	100%	98%	100%	99%	100%	98%	100%	99%	97%	100%	100%	99%	98%	100%	99%	100%
three	#	1	1		1				1			1			1			1	
	ROW %	100%	100%		100%				100%			100%			100%			100%	
	COL %	1%	1%		3%				1%			3%			1%			1%	
dont know	#	1	1				1		1		1					1		1	
	ROW %	100%	100%				100%		100%		100%					100%		100%	
	COL %	1%	1%				1%		1%		1%					2%		1%	
TOTAL	#	200	98	102	40	84	73	81	89	28	82	36	53	31	92	41	25	181	19
	ROW %	100%	49%	51%	20%	42%	37%	41%	45%	14%	41%	18%	27%	16%	46%	21%	13%	91%	10%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

18. AGE		TOTAL	23. GENDER		18. AGE			19.1 HOUSEHOLD INCOME		20.1 PEOPLE RESIDING IN YOUR HOME				21.1 CARS/ TRUCKS IN YOUR HOUSHOLD				22. H.H. DWELLING	
			male	fem.	18-34	35-54	55+	<30K	30K+	1	2	3	4+	1	2	3	4+	single fam.	misc
18- 34	#	40	20	20	40			12	21	1	10	11	18	2	22	10	5	35	5
	ROW %	100%	50%	50%	100%			30%	53%	3%	25%	28%	45%	5%	55%	25%	13%	88%	13%
	COL %	20%	20%	20%	100%			15%	24%	4%	12%	31%	34%	7%	24%	24%	20%	19%	26%
35- 54	#	84	45	39		84		30	48	8	22	20	34	8	39	18	15	74	10
	ROW %	100%	54%	46%		100%		36%	57%	10%	26%	24%	41%	10%	46%	21%	18%	88%	12%
	COL %	42%	46%	38%		100%		37%	54%	29%	27%	56%	64%	26%	42%	44%	60%	41%	53%
55+	#	73	32	41			73	38	20	18	49	4	1	19	31	12	5	70	3
	ROW %	100%	44%	56%			100%	52%	27%	25%	67%	6%	1%	26%	43%	16%	7%	96%	4%
	COL %	37%	33%	40%			100%	47%	23%	64%	60%	11%	2%	61%	34%	29%	20%	39%	16%
NA	#	3	1	2				1		1	1	1		2		1		2	1
	ROW %	100%	33%	67%				33%		33%	33%	33%		67%		33%		67%	33%
	COL %	2%	1%	2%				1%		4%	1%	3%		7%		2%		1%	5%
TOTAL	#	200	98	102	40	84	73	81	89	28	82	36	53	31	92	41	25	181	19
	ROW %	100%	49%	51%	20%	42%	37%	41%	45%	14%	41%	18%	27%	16%	46%	21%	13%	91%	10%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

19. HOUSEHOLD INCOME		TOTAL	23. GENDER male	fem.	18. AGE 18-34	35-54	55+	19.1 HOUSEHOLD INCOME <30K	30K+	20.1 PEOPLE RESIDING IN YOUR HOME 1	2	3	4+	21.1 CARS/ TRUCKS IN YOUR HOUSHOLD 1	2	3	4+	22. H.H. DWELLING single fam.	misc
<10K	#	24	6	18	4	8	11	24		13	6	3	2	10	5	3	1	17	7
	ROW %	100%	25%	75%	17%	33%	46%	100%		54%	25%	13%	8%	42%	21%	13%	4%	71%	29%
	COL %	12%	6%	18%	10%	10%	15%	30%		46%	7%	8%	4%	32%	5%	7%	4%	9%	37%
$10-19K	#	21	10	11	1	7	13	21		4	10	4	3	4	13	1	2	20	1
	ROW %	100%	48%	52%	5%	33%	62%	100%		19%	48%	19%	14%	19%	62%	5%	10%	95%	5%
	COL %	11%	10%	11%	3%	8%	18%	26%		14%	12%	11%	6%	13%	14%	2%	8%	11%	5%
$20-29K	#	36	16	20	7	15	14	36		4	14	5	13	6	15	10	5	30	6
	ROW %	100%	44%	56%	19%	42%	39%	100%		11%	39%	14%	36%	17%	42%	28%	14%	83%	17%
	COL %	18%	16%	20%	18%	18%	19%	44%		14%	17%	14%	25%	19%	16%	24%	20%	17%	32%
$30-39K	#	42	25	17	12	16	14		42	2	19	9	12	3	24	9	4	39	3
	ROW %	100%	60%	41%	29%	38%	33%		100%	5%	45%	21%	29%	7%	57%	21%	10%	93%	7%
	COL %	21%	26%	17%	30%	19%	19%		47%	7%	23%	25%	23%	10%	26%	22%	16%	22%	16%
$40-49K	#	17	4	13	5	11	1		17		8	3	6		13	3	1	17	
	ROW %	100%	24%	77%	29%	65%	6%		100%		47%	18%	35%		77%	18%	6%	100%	
	COL %	9%	4%	13%	13%	13%	1%		19%		10%	8%	11%		14%	7%	4%	9%	
$50-74K	#	23	17	6	3	16	4		23		9	5	9	1	11	6	5	23	
	ROW %	100%	74%	26%	13%	70%	17%		100%		39%	22%	39%	4%	48%	26%	22%	100%	
	COL %	12%	17%	6%	8%	19%	6%		26%		11%	14%	17%	3%	12%	15%	20%	13%	
75K+	#	7	6	1	1	5	1		7		3	2	2		2	1	4	7	
	ROW %	100%	86%	14%	14%	71%	14%		100%		43%	29%	29%		29%	14%	57%	100%	
	COL %	4%	6%	1%	3%	6%	1%		8%		4%	6%	4%		2%	2%	16%	4%	
NA	#	30	14	16	7	6	15			5	13	5	6	7	9	8	3	28	2
	ROW %	100%	47%	53%	23%	20%	50%			17%	43%	17%	20%	23%	30%	27%	10%	93%	7%
	COL %	15%	14%	16%	18%	7%	21%			18%	16%	14%	11%	23%	10%	20%	12%	16%	11%
TOTAL	#	200	98	102	40	84	73	81	89	28	82	36	53	31	92	41	25	181	19
	ROW %	100%	49%	51%	20%	42%	37%	41%	45%	14%	41%	18%	27%	16%	46%	21%	13%	91%	10%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

21. HOW MANY CARS OR TRUCKS ARE OWNED BY PEOPLE IN YOUR HOUSEHOLD?		TOTAL	23. GENDER		18. AGE			19.1 HOUSEHOLD INCOME		20.1 PEOPLE RESIDING IN YOUR HOME				21.1 CARS/ TRUCKS IN YOUR HOUSHOLD				22. H.H. DWELLING	
			male	fem.	18-34	35-54	55+	<30K	30K+	1	2	3	4+	1	2	3	4+	sin- gle fam.	misc
1	#	31	9	22	2	8	19	20	4	15	14	1	1	31				23	8
	ROW %	100%	29%	71%	7%	26%	61%	65%	13%	48%	45%	3%	3%	100%				74%	26%
	COL %	16%	9%	22%	5%	10%	26%	25%	5%	54%	17%	3%	2%	100%				13%	42%
2	#	92	45	47	22	39	31	33	50	4	44	17	27		92			90	2
	ROW %	100%	49%	51%	24%	42%	34%	36%	54%	4%	48%	19%	29%		100%			98%	2%
	COL %	46%	46%	46%	55%	46%	43%	41%	56%	14%	54%	47%	51%		100%			50%	11%
3	#	41	24	17	10	18	12	14	19	1	14	8	18			41		36	5
	ROW %	100%	59%	42%	24%	44%	29%	34%	46%	2%	34%	20%	44%			100%		88%	12%
	COL %	21%	25%	17%	25%	21%	16%	17%	21%	4%	17%	22%	34%			100%		20%	26%
4	#	16	10	6	4	9	3	5	9		7	5	4				16	16	
	ROW %	100%	63%	38%	25%	56%	19%	31%	56%		44%	31%	25%				100%	100%	
	COL %	8%	10%	6%	10%	11%	4%	6%	10%		9%	14%	8%				64%	9%	
5	#	3	2	1		3			2		1	1	1				3	3	
	ROW %	100%	67%	33%		100%			67%		33%	33%	33%				100%	100%	
	COL %	2%	2%	1%		4%			2%		1%	3%	2%				12%	2%	
6+	#	6	5	1	1	3	2	3	3	1	1	2	2				6	6	
	ROW %	100%	83%	17%	17%	50%	33%	50%	50%	17%	17%	33%	33%				100%	100%	
	COL %	3%	5%	1%	3%	4%	3%	4%	3%	4%	1%	6%	4%				24%	3%	
dontknow	#	3	1	2	1	1	1		2	1		2						3	
	ROW %	100%	33%	67%	33%	33%	33%		67%	33%		67%						100%	
	COL %	2%	1%	2%	3%	1%	1%		2%	4%		6%						2%	
none	#	8	2	6		3	5	6		6	1							4	4
	ROW %	100%	25%	75%		38%	63%	75%		75%	13%							50%	50%
	COL %	4%	2%	6%		4%	7%	7%		21%	1%							2%	21%
TOTAL	#	200	98	102	40	84	73	81	89	28	82	36	53	31	92	41	25	181	19
	ROW %	100%	49%	51%	20%	42%	37%	41%	45%	14%	41%	18%	27%	16%	46%	21%	13%	91%	10%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

20. HOW MANY PEOPLE RESIDE IN YOUR HOME?		TOTAL						INCOME		IN YOUR HOME				IN YOUR HOUSHOLD					
			male	fem.	18-34	35-54	55+	<30K	30K+	1	2	3	4+	1	2	3	4+	single fam.	misc
1	#	28	10	18	1	8	18	21	2	28				15	4	1	1	18	10
	ROW %	100%	36%	64%	4%	29%	64%	75%	7%	100%				54%	14%	4%	4%	64%	36%
	COL %	14%	10%	18%	3%	10%	25%	26%	2%	100%				48%	4%	2%	4%	10%	53%
2	#	82	46	36	10	22	49	30	39		82			14	44	14	9	76	6
	ROW %	100%	56%	44%	12%	27%	60%	37%	48%		100%			17%	54%	17%	11%	93%	7%
	COL %	41%	47%	35%	25%	26%	67%	37%	44%		100%			45%	48%	34%	36%	42%	32%
3	#	36	14	22	11	20	4	12	19			36		1	17	8	8	35	1
	ROW %	100%	39%	61%	31%	56%	11%	33%	53%			100%		3%	47%	22%	22%	97%	3%
	COL %	18%	14%	22%	28%	24%	6%	15%	21%			100%		3%	19%	20%	32%	19%	5%
4	#	36	18	18	12	23	1	13	18				36		22	11	3	35	1
	ROW %	100%	50%	50%	33%	64%	3%	36%	50%				100%		61%	31%	8%	97%	3%
	COL %	18%	18%	18%	30%	27%	1%	16%	20%				68%		24%	27%	12%	19%	5%
5	#	13	9	4	5	8		3	9				13		4	6	3	12	1
	ROW %	100%	69%	31%	39%	62%		23%	69%				100%		31%	46%	23%	92%	8%
	COL %	7%	9%	4%	13%	10%		4%	10%				25%		4%	15%	12%	7%	5%
6+	#	4	1	3	1	3		2	2				4	1	1	1	1	4	
	ROW %	100%	25%	75%	25%	75%		50%	50%				100%	25%	25%	25%	25%	100%	
	COL %	2%	1%	3%	3%	4%		3%	2%				8%	3%	1%	2%	4%	2%	
dontknow	#	1		1			1											1	
	ROW %	100%		100%			100%											100%	
	COL %	1%		1%			1%											1%	
TOTAL	#	200	98	102	40	84	73	81	89	28	82	36	53	31	92	41	25	181	19
	ROW %	100%	49%	51%	20%	42%	37%	41%	45%	14%	41%	18%	27%	16%	46%	21%	13%	91%	10%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

22. DO YOU LIVE IN A,		TOTAL	23. GENDER male	fem.	18. AGE 18-34	35-54	55+	19.1 HOUSEHOLD INCOME <30K	30K+	20.1 PEOPLE RESIDING IN YOUR HOME 1	2	3	4+	21.1 CARS/ TRUCKS IN YOUR HOUSHOLD 1	2	3	4+	22. H.H. DWELLING sin-gle fam.	misc
single family home	#	181	89	92	35	74	70	67	86	18	76	35	51	23	90	36	25	181	
	ROW %	100%	49%	51%	19%	41%	39%	37%	48%	10%	42%	19%	28%	13%	50%	20%	14%	100%	
	COL %	91%	91%	90%	88%	88%	96%	83%	97%	64%	93%	97%	96%	74%	98%	88%	100%	100%	
apartment	#	8	5	3		6	2	8		6	2			2	1	1			8
	ROW %	100%	63%	38%		75%	25%	100%		75%	25%			25%	13%	13%			100%
	COL %	4%	5%	3%		7%	3%	10%		21%	2%			7%	1%	2%			42%
condo	#	1		1	1			1		1				1					1
	ROW %	100%		100%	100%			100%		100%				100%					100%
	COL %	1%		1%	3%			1%		4%				3%					5%
mobile home/ trailer	#	10	4	6	4	4	1	5	3	3	4	1	2	5	1	4			10
	ROW %	100%	40%	60%	40%	40%	10%	50%	30%	30%	40%	10%	20%	50%	10%	40%			100%
	COL %	5%	4%	6%	10%	5%	1%	6%	3%	11%	5%	3%	4%	16%	1%	10%			53%
TOTAL	#	200	98	102	40	84	73	81	89	28	82	36	53	31	92	41	25	181	19
	ROW %	100%	49%	51%	20%	42%	37%	41%	45%	14%	41%	18%	27%	16%	46%	21%	13%	91%	10%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
23. GENDER																			
male	#	98	98		20	45	32	32	52	10	46	14	28	9	45	24	17	89	9
	ROW %	100%	100%		20%	46%	33%	33%	53%	10%	47%	14%	29%	9%	46%	25%	17%	91%	9%
	COL %	49%	100%		50%	54%	44%	40%	58%	36%	56%	39%	53%	29%	49%	59%	68%	49%	47%
fem.	#	102		102	20	39	41	49	37	18	36	22	25	22	47	17	8	92	10
	ROW %	100%		100%	20%	38%	40%	48%	36%	18%	35%	22%	25%	22%	46%	17%	8%	90%	10%
	COL %	51%		100%	50%	46%	56%	61%	42%	64%	44%	61%	47%	71%	51%	42%	32%	51%	53%
TOTAL	#	200	98	102	40	84	73	81	89	28	82	36	53	31	92	41	25	181	19
	ROW %	100%	49%	51%	20%	42%	37%	41%	45%	14%	41%	18%	27%	16%	46%	21%	13%	91%	10%
	COL %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%