CITY OF BROOKINGS
TRANSPORTATION SYSTEM PLAN

August 2002

Prepared for

The City of Brookings, Oregon and
Oregon Department of Transportation

Prepared by
David Evans and Associates, Inc.
and
H. Lee & Associates

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CHAPTER 1: INTRODUCTION

The City of Brookings Transportation System Plan (TSP) 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 established by the Department of Land Conservation and Development. This document also identifies and prioritizes transportation projects for inclusion in the Oregon Department of Transportation's (ODOT's) Statewide Transportation Improvement Program (STIP).

PLANNING AREA

In May 1996, the South Coast Transportation Study was completed by Parametrix, Inc., for the area of Curry County south of Cape Ferrelo to the California border, including Brookings and its proposed Urban Growth Boundary (UGB). The South Coast Transportation Study has been used as a foundation for this local transportation system plan. Separate but related transportation system plans have been completed for Curry County, Port Orford, and Gold Beach.

The City of Brookings is located on the southern coast of Oregon approximately five miles north of the Oregon-California border, on the north side of the Chetco River. Brookings is the largest city in Curry County, with 25 percent of the county's population or approximately 5,000 inhabitants. See Figure 1-1 Brookings Planning Area.

In 1981, the lumber and woods products industry accounted for 60 percent of the basic jobs in Curry County. However, the timber harvest in the county has been declining since 1959, and the traditional dominance of the lumber industry has been supplanted by a relatively strong fishing and fish processing industry, by growth in tourism, and by the demand for services for a large and growing population of retired people. The driving forces behind the transition from lumber to fishing, services, and tourism are the area's resources, notably, a moderate climate, scenic beauty, the Chetco River and its sheltered harbor, and several state parks.

Like most communities along the Oregon Coast, the history and fortunes of the Brookings area have been intimately connected with US Highway 101 (US 101). Over the years, as the local street systems and US 101 became increasingly interconnected, the land abutting US 101 has developed with residential and commercial uses. US 101 serves as both a "Main Street" for Brookings, and a major conduit for people, goods, and services to and from Brookings. The provision of an adequate highway with appropriate access is of major importance to the continued viability of the southern Oregon Coast.

The Comprehensive Plan land use map of the Brookings Transportation System Plan (TSP) planning area is shown in Figure 1-2.

THE PLANNING PROCESS

The Brookings TSP was prepared as part of a countywide effort to prepare TSPs for all of Curry County, Brookings, Gold Beach and Port Orford. Each plan was developed through a series of technical analyses combined with systematic input and review by the County, the Cities, the Management Team, the Transportation Advisory Committee (TAC), ODOT, and the public. The TAC consisted of staff, elected and appointed officials, residents, and business people from Curry County and Brookings. Key elements of the process include:

- Introduction and Community Involvement (Chapter 1)

- Defining Goals and Objectives (Chapter 2)
- Reviewing existing plans and transportation conditions (Chapters 3 and 4)
- Developing population, employment, and travel forecasts (Chapter 5)
- Developing and evaluating potential transportation system improvements (Chapter 6)
- Developing the Transportation System Plan and Capital Improvement Program (Chapter 7)
- Funding Options (Chapter 8)
- Developing recommended policies and ordinances (Under a Separate Cover)

Community Involvement

Community involvement is an integral component in the development of TSPs for Brookings, Curry County and the other cities. Since the transportation and land use issues facing each of the communities were similar, the public involvement program included all the jurisdictions, using three different techniques.

A combined management team and TAC provided guidance on technical issues and direction regarding policy issues to the consultant team. Staff members from each local jurisdiction and ODOT and a local resident from each community served on this committee. The TAC met several times during the course of the project.

The second part of the community involvement effort involved the consultant team meeting individually with representatives of each jurisdiction. The purpose of these meetings was to collect information specific to each jurisdiction and to discuss the development of the individual cities and county TSPs.

The third part will consist of public meetings within Brookings during the adoption process. The general public will be invited to learn about the TSP planning process and provide input on transportation issues and concerns. Notification of the public meetings will be published in the local newspaper and broadcast on the local radio station.

In addition, an extensive public involvement program was conducted during the development of the South Coast Transportation Study in 1996. The goals of this public involvement program included identifying community values regarding transportation issues, involving the public in the study process, and developing community ownership in the transportation study and its conclusions. To accomplish this, the public involvement program solicited input from a wide range of public interests through the following means: a 200-sample public opinion survey; four study newsletters; four public meetings; and creation of an advisory committee comprising representatives from diverse special interest groups. Details of each activity can be found in the South Coast Transportation Study, pages 4 to 6.

Goals and Objectives

Based on data from the South Coast Transportation Study, the Brookings Comprehensive Plan, and input from the City, the management team/TAC, and the community, a set of goals and objectives were defined for the TSP. 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 complete the planning process begun in the South Coast Transportation Study, all applicable Brookings transportation and land use plans and policies, as well as the inventory of public facilities,

were reviewed. The purpose of these efforts was to understand the history of transportation planning in Brookings, including the street system improvements planned and implemented in the past, and how the County 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 inventory is 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. The South Coast Transportation Study forecasted traffic volumes for the year 2015, based on projected population and employment growth for the study area. To develop estimates of future traffic volumes attributable to this development, the trip generation potential of vacant land was calculated, a trip distribution pattern for the future trips was developed, and future trips were assigned to the roadway network based on the trip distribution pattern. Future traffic volumes for the existing plus committed transportation systems were projected using ODOT's Level 2 – Cumulative Analysis methodology. The overall travel demand forecasting process is described in Chapter 5.

Transportation System Potential Improvements

Once the travel forecasts were developed, it was possible to evaluate a series of potential transportation system improvements and a number of alternatives. The evaluation of the potential transportation improvement alternatives was based on a qualitative review of safety, environmental, socioeconomic, and land use impacts, as well as estimated cost. After evaluating the results of the potential improvements analysis, a series of recommended transportation system improvements were selected, and 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. Chapter 7 details the plan elements for each mode.

Funding Options

Brookings will need to work with ODOT to finance new transportation projects over the 20-year planning period. An overview of funding and financing options that might be available to the community are described in Chapter 8.

Recommended Policies and Ordinances

Suggested Comprehensive Plan policies and implementing zoning and subdivision ordinances are included in a separate document. These policies and ordinances are intended to support the TSP and satisfy the requirements of the TPR.

RELATED DOCUMENTS

The Brookings TSP addresses the local transportation needs in the city. There are several other documents that address specific transportation elements or areas in Brookings.

Other Transportation System Plans

A TSP has been prepared for Curry County. The county TSP addresses the need for the community outside each city's Urban Growth Boundary (UGB). It provides roadway standards, access management standards, and modal plans. In some cases, a project may be identified in the Brookings TSP which then needs to be addressed in the Curry County TSP as well.

Corridor Plans

One major highway corridor passes through Brookings: US 101 (the Oregon Coast Highway). ODOT developed the Oregon Coast Highway Corridor Master Plan for this highway in 1995. The Plan is largely advisory in nature, as a number of state policies and projects have been adopted since the Master Plan was completed that either contradict or clarify portions of the US 101 plan. Nonetheless, the Oregon Coast Highway Corridor Master Plan provides a general vision statement for the corridor and five goals which address it:

- Process – Develop a transportation plan that builds on ongoing planning and implementation partnership among ODOT and each of the communities and jurisdictions that have a stake in the future of transportation along the Oregon Coast Highway Corridor.
- Transportation – Develop a 20-year plan to manage future transportation needs in the Coast Highway Corridor and prolong the useful life of the existing transportation system.
- Resources – Develop a plan for a transportation system to harmonize with the inherent scenic beauty of the coastal region, protect environmental resources, and enhance the enjoyment of the Corridor's beauty and resources by corridor users.
- Community – Develop a plan for a transportation system that supports the individual character and plans of the communities along the Corridor.
- Economic – Develop a plan for a transportation system that supports sustainable economic diversity and vitality and provide responsible stewardship of public funds.

Furthermore, the Transportation Goal should:

1. Provide a transportation system that can adapt to future travel modes and practices.
2. Optimize the existing transportation system to reduce or delay the need for additional travel lanes or other large-scale improvements.
3. Improve safety for vehicle, bicycle, and pedestrian users.
4. Minimize conflicts between commercial, local, and recreational traffic.
5. Minimize congestion on US 101 and enhance mobility within and between communities along the transportation corridor.
6. Reduce vehicle travel demand through other modes of travel and demand management strategies.
7. Improve east/west corridor accesses.
8. Identify alternative routes for use during natural disasters and/or emergencies.

Several corridor-wide policies were identified to address the following:

1. Communication among ODOT and communities and jurisdictions affected by this Plan
2. Intercity passenger service
3. Intermodal improvements
4. Road capacity improvements
5. Bridges
6. Access management
7. East-west corridors
8. Emergency routes and emergency response
9. Preserving and enhancing scenic resources
10. Land use planning to reduce auto dependence
11. Bicycle and pedestrian facilities
12. Visual Features
13. Economic Viability
14. Parallel Route
15. Airports
16. Land use planning to prevent incompatible land uses around airports
17. The Plan's focus in Curry County is to enhance and protect the scenic beauty of the corridor while increasing capacity and reliability on the transportation system. Specific Plan Activities include developing a southern "gateway to Oregon," local street circulation improvements, and improving facilities for travelers, including turnouts, signage, and shoulder improvements. The Plan identifies a specific need for a study of an east-west connection to the I-5 corridor in the Curry County, Port Orford, and Gold Beach TSPs.

Other State Plans

In addition to the ODOT corridor plan, coordination with the following state plans is required:

- Oregon Transportation Plan
- Oregon Highway Plan
- Oregon Bicycle Plan
- Oregon Aviation Plan

CHAPTER 2: GOALS AND OBJECTIVES

The purpose of the TSP is to provide a guide for the City of Brookings to meet its transportation goals and objectives. The following goals and objectives were developed from information contained in the city's Comprehensive Plan and public concerns as expressed during public meetings. An overall goal was drawn from the Plan, along with more specific goals and objectives. Throughout the planning process, each element of the plan was evaluated against these parameters.

OVERALL TRANSPORTATION GOAL

To provide and encourage a safe, convenient, and economic transportation system.

Goal 1

Preserve the function, capacity, level of service, and safety of the state highways.

Objectives

A. Develop local access management standards that will meet the requirements of the TPR and also consider the needs of the affected communities.

B. Develop alternative, parallel routes.

C. Encourage alternative modes of transportation.

D. Encourage transportation demand management programs (i.e., rideshare and park and ride).

E. Encourage transportation system management (i.e., signal synchronization, median barriers, etc.).

F. Develop procedures to minimize impacts to and protect transportation facilities, corridors, or sites during the development review process.

Goal 2

Improve and enhance safety and traffic circulation and preserve the level of service on local street systems.

Objectives

A. Develop an efficient road network that would maintain a level of service C or better.

B. Improve and maintain existing roadways.

C. Promote planning coordination between the local jurisdictions, the County, and the State.

D. Identify truck routes to reduce truck traffic in urban areas.

E. Examine the need for speed reduction in specific areas.

F. Identify local problem spots and recommend solutions.

Goal 3

Identify the 20-year roadway system needs to accommodate developing or undeveloped areas without undermining the rural nature of the city.

Objectives

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

B. Integrate new arterial and collector routes into a grid system with an emphasis on reducing pressure on traditionally heavy traffic routes.

C. Improve access into and out of the city for goods and services.

D. Improve the access onto and off of arterial roadways to encourage growth.

Goal 4

Increase the use of alternative modes of transportation (walking, bicycling, rideshare/carpooling, and transit) through improved access, safety, and service.

Objectives

A. Encourage sidewalks, bikeways, and safe crossings on urban arterial and collector roads.

B. Encourage shoulders on rural collector and arterial streets.

C. Encourage a city bicycle plan.

D. Encourage alternative modes and rideshare/carpool programs through community awareness and education.

E. Expand the Dial-a-Ride program as the most cost-efficient means of accommodating projected transit system demand.

F. Seek Transportation and Growth Management (TGM) and other funding for projects evaluating and improving the environment for alternative modes of transportation.

G. Periodically assess pedestrian and bicycle modes of transportation within the city and develop programs to meet demonstrated needs.

Goal 5

Provide and encourage a safe, convenient and economic transportation system.

Objectives

A. Encourage greater accessibility to the downtown business district by vehicles and pedestrians.

B. Develop street patterns to discourage high-speed vehicular traffic and noise in residential areas.

C. Provide adequate access to industrial land.

D. Encourage the development of additional port facilities and support facilities.

E. Provide for foot traffic in residential areas and provide bike paths and walkways in appropriate areas.

F. Examine the need for and the feasibility of public transit and encourage programs that meet the needs of the transportation disadvantaged.

G. Encourage measures that would reduce the region's general isolation from the rest of Oregon.

H. Support improvement of intra-regional transportation, construction of passing lanes and the couplet on US 101.

Goal 6

Ensure that the road system within the city and urban area is adequate to meet public needs, including the transportation disadvantaged.

Objectives

A. Develop a city transportation plan.

B. Meet identified maintenance and level of service standards.

C. Direct commercial development and use access onto major arterials by means of improved city streets.

D. Ensure that roads created in land division and development be designed to tie into existing and anticipated road circulation patterns.

E. Review and revise, if necessary, street cross-section standards for local, collector, and arterial streets to enhance safety and mobility.

F. Develop an access management strategy for US 101.

G. Evaluate the need for traffic control devices, particularly along US 101.

H. Analyze the safety of traveling speeds and consider modifying posted speeds as necessary.

Goal 7

Improve coordination among Curry County, the Oregon Department of Transportation (ODOT), the US Forest Service (USFS), the Federal Highway Administration (FHWA), and the City.

Objectives

A. Cooperate with ODOT in the implementation of the Statewide Transportation Improvement Program (STIP).

B. Encourage improvement of state highways, especially US 101.

C. Work with the county in establishing cooperative road improvement programs and schedules.

D. Work with the county in establishing the right-of-way needed for new roads identified in the TSP.

E. Take advantage of federal and state highway funding programs.

Goal 8

Support efforts to maintain the airport facilities for small aircraft and charter services.

Objectives

A. Encourage improvement to airport facilities.

B. Assure that airport approach zones are protected, by coordinating development in the Brookings Urban Growth Boundary and Area of Mutual Interest with the State of Oregon and Curry County in accordance with the Brookings Airport Master Plan.

C. Develop land use planning to ensure compatibility with adjacent land uses.

CHAPTER 3: TRANSPORTATION SYSTEM INVENTORY

As part of the planning process, Parametrix conducted a field survey of existing roadway conditions and the transportation system in Brookings. This inventory covered the street system as well as the pedestrian, bikeway, public transportation, air, and water 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 Brookings 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 road system inventory was reviewed for all arterial roadways, collector, and local access roadways within Brookings that are included in the Transportation System Plan planning area. Inventory elements include:

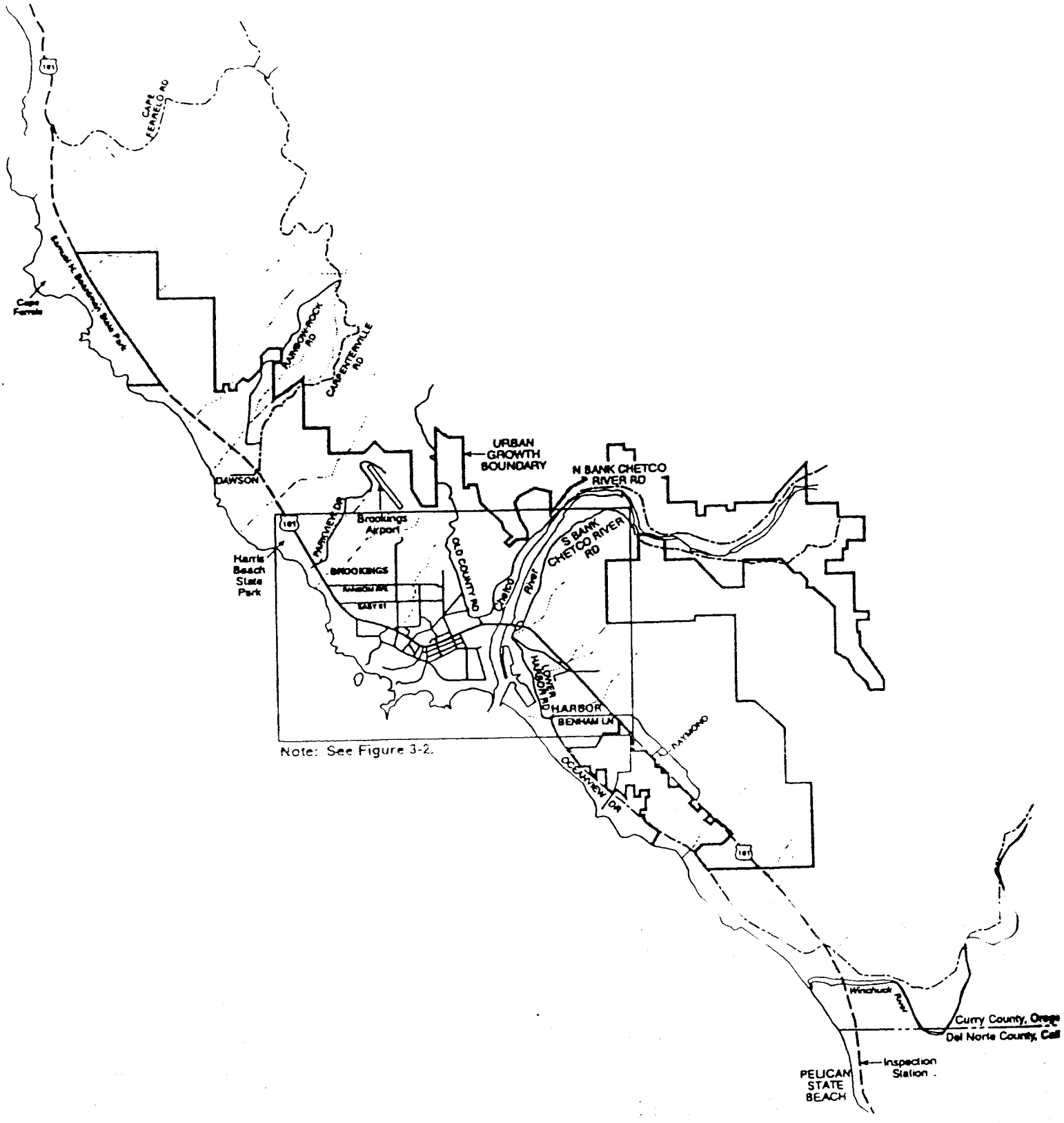
- road classification and jurisdiction
- road width and right-of-way
- number of travel lanes
- presence of on-street parking, sidewalks, or bikeways
- speed limits
- general pavement conditions

Appendix B lists the complete inventory of roads prepared by Parametrix in Existing Conditions Report (Technical Memorandum #1) to the South Coast Transportation Study. Figures 3-1 and 3-2 of Brookings and its Urban Growth Area show the functional classifications of the arterial roadways, which were taken from a roadway functional classification map obtained from ODOT.

State Highways

Discussion of the Brookings street system must include any state highways that traverse the planning area. Although Brookings has no direct control over the state highways, adjacent development and local traffic patterns are heavily influenced by the highways. Brookings is served by one state highway, US 101. This highway serves as the major route through the city serving residential and commercial development focused along the corridor.

The 1999 Oregon Highway Plan (OHP) classifies the state highway system into five different categories. These categories are as follows: interstate highways (NHS), state highways (NHS), regional highways, district highways, and local interest roads. The classification system guides ODOT in planning, management, and investment decisions regarding state facilities.



N

NOT TO SCALE

Arterial

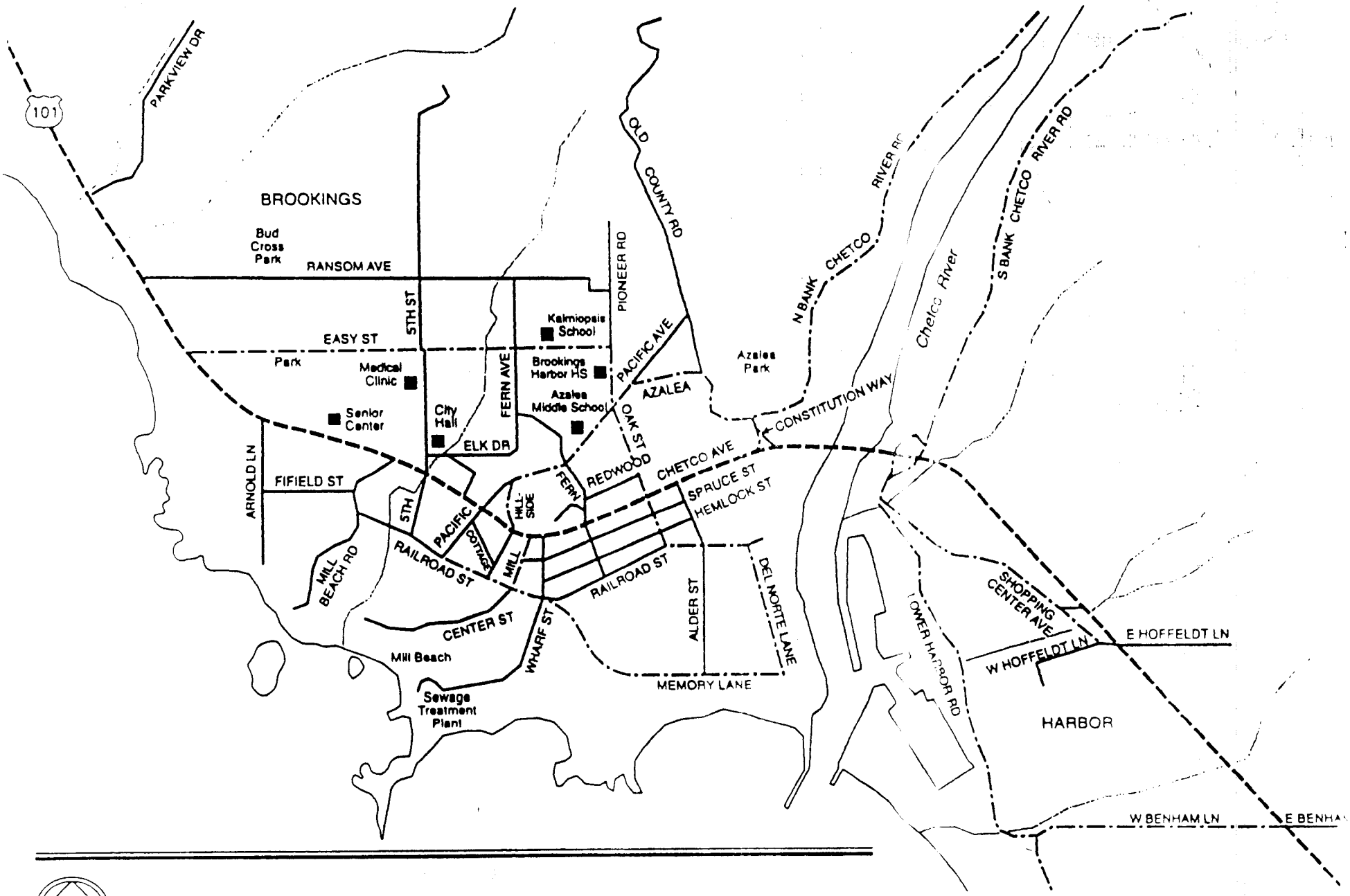
Collector

Local

Source: South Coast Transportation Study

Prepared by Parametrix, Inc. May 1996

Figure 3-1
Functional Classification, Brookings UGA



Source: South Coast Transportation Study
Prepared by Parametrix, Inc., May 1996

Figure 3-2
Functional Classification,
City of Brookings

US 101 in Brookings is identified as a statewide highway. According to the OHP, a state highway is defined as follows:

"Statewide highways (NHS) typically provide inter-urban and inter-regional mobility and provide connections to larger urban areas, ports, and major recreation areas that are not directly served by Interstate Highways. A secondary function is to provide connections for intra-urban and intra-regional trips. The management objective is to provide safe and efficient, high-speed, continuous-flow operation. In constrained and urban areas, interruptions to flow should be minimal. Inside Special Transportation Areas (STAs), local access may also be a priority." The Oregon Highway Plan provides operational spacing standards and access management spacing standards for highways such as US 101 and Carpenterville Road.

US 101 is a statewide highway which runs along the entire Oregon coastline. To the south, US 101 connects Brookings to northern California. To the north, US 101 connects Brookings to Gold Beach, and then continues on to Port Orford, Bandon, Coos Bay, and eventually to the Washington state line.

Within the City of Brookings and the Harbor subarea, US 101 is a four-lane roadway with left turn pockets at most major intersections. Outside the city limits, US 101 is a two- to three-lane roadway. The third lane is a truck-climbing lane on steep grades. The pavement widths vary from 32 feet to 84 feet, with lane widths of 12 feet. Speeds vary along US 101 through Brookings varying from 55 MPH in the north from Carpenterville Road to Crissey Circle where the speed is reduced to 45 MPH. The speed limits on the stretch between Crissey Circle and Benham Lane range from 25 mph to 45 mph. On other lengths of US 101 in Brookings, the speed limit is primarily 55 mph with no sidewalks, parking or bike lanes.

Inside the city limits, US 101 is primarily bordered by commercially zoned areas. Some sections have adjacent residential or public open space zones. In the UGB, adjacent zoning is a mixture of light and general commercial, rural residential, agricultural, forestry grazing, and exclusive farm use designations.

City Roadways

Identification of the roadway functions is the basis for planning roadway improvements and the appropriate standards, such as width and design speed, that would apply to each roadway facility. The following definitions serve as a general guide in determining street classifications:

- Arterials – Intracommunity roadways connecting community centers with major facilities. In general, arterials serve both through traffic and trips of moderate length. Access is partially controlled with infrequent access to abutting properties. The South Coast Study area arterial streets carry traffic ranging from 5,200 to 18,000 vehicles daily.
- Collector – Streets connecting residential neighborhoods with smaller community centers and facilities as well as access to the arterial system. Property access is generally a higher priority for collectors; through-traffic movements are served as a lower priority. The majority of the Brookings area collector streets carry between 2,200 and 5,700 vehicles daily.
- Local Access Streets – Streets within the residential neighborhoods connecting the housing with the arterial system. Property access is the main priority; through traffic movement is not encouraged.

US 101 is the only arterial within the Brookings Urban Growth Boundary.

The following collectors are within the Brookings Urban Growth Boundary (may include only portions of the roadway): Fifth Street, Carpenterville Road, North Bank Chetco River Road, South Bank Chetco River Road, Easy Street, Lower Harbor Road, West Benham Lane, Shopping Center Avenue, Oceanview

Drive, Hillside Avenue, Pacific Avenue, Azalea, Old County Road, Constitution Way, Center Street, Railroad Street, Memory Lane, Del Norte Lane, Pioneer Road, Parkview Drive, Ransom Avenue, and Oak Street.

Most of the collectors in Brookings are two lanes wide, with lane widths of 10, 11 or 12 feet. Only West Benham Lane has sidewalks on both sides, while five others have sidewalks on at least one side (S. Bank, Chetco River Road, Easy Street, Lower Harbor Road, Shopping Center Avenue, and Azalea Park Road). Speed limits range from 25 to 40 mph. Five collectors have bike lanes (S. Bank Chetco River Road, Lower Harbor road, W. Benham Lane, Shopping Center Avenue, and Oceanview Drive).

Street Layout

The street layout of the City of Brookings is primarily centered around the US 101 corridor. Some of the local streets that connect to US 101 form a simple grid system, while other areas of the city, and the collectors, tend not to follow a grid system.

Bridges

ODOT maintains an up-to-date inventory and appraisal of Oregon bridges. Part of this inventory involves the evaluation of three mutually exclusive elements of bridges. One element identifies which bridges are structurally deficient. This is determined based on the condition rating for the deck, superstructure, substructure, or culvert and retaining walls. It may also be based on the appraisal rating of the structural condition or waterway adequacy. Another element identifies which bridges are functionally obsolete. This element is determined based on the appraisal rating for the deck geometry, underclearances, approach roadway alignment, structural condition, or waterway adequacy. The third element summarizes the sufficiency ratings for all bridges. The sufficiency rating is a complex formula which takes in account four separate factors to obtain a numeric value rating the ability of a bridge to service demand. The scale ranges from 0 to 100 with higher ratings indicating optimal conditions and lower ratings indicating insufficiency. Bridges with ratings under 55 may be nearing a structurally deficient condition.

There is one bridge within the City of Brookings which is part of ODOT's inventory system and it is state-owned and maintained. The bridge (ODOT bridge No. 01143D) is located along US 101 (MP 357.96) crossing the Chetco River at the south city limits. According to the ODOT bridge inventory data, this bridge is currently rated as functionally obsolete. Bridges that fall into this category usually need to be repaired or replaced some time in the next 20 years. Functionally obsolete bridges are structurally sound, but have some other design deficiency such as being too narrow for today's standards, having poor approach roads, or having guardrails which do not meet today's standards. According to the ODOT bridge inventory data, this bridge is currently rated as functionally obsolete because it does not meet the minimum lateral underclearance recommended. This means that the columns supporting the bridge are located less than 20 feet from the edge of the pavement of the roadway underneath (the desired minimum horizontal clearance).

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 Brookings indicates that walking could be employed regularly for short trips, weather permitting, to reach a variety of destinations. Typically, a short trip that would be taken by a pedestrian would be around one half-mile. 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 shop windows. They may also feel inclined to return to renew the pleasant experience time and again.

Sidewalks are generally provided throughout downtown Brookings, although they are frequently not continuous. Limited sidewalks exist outside the downtown area. Figure 3-3 shows which streets have sidewalks.

BIKEWAY SYSTEM

Like pedestrians, bicyclists are often overlooked when considering transportation facilities. Bicycles are not often though of as a means of transportation. 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 Brookings, a cyclist can travel to any destination in town in a very short time.

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 two miles.

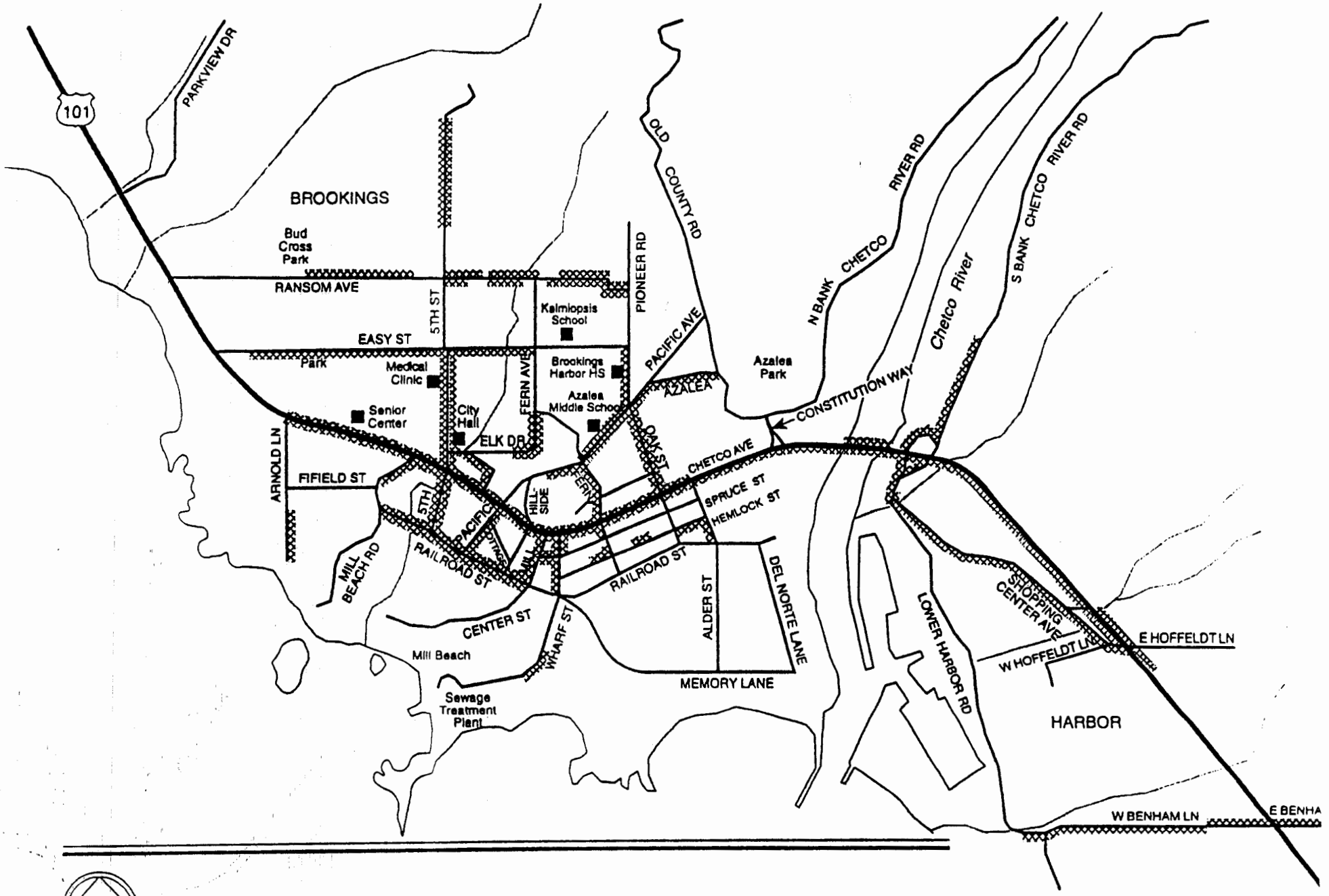
Bicycle facilities can be categorized into several classifications dependent upon the degree to which physical space is provided for cyclists and/or separation is provided from vehicular traffic. Typical classifications include:

- Shared roadway – Bicycles and vehicles share the same roadway area under this classification. The shared roadway facility is best used where there is minimal vehicle traffic to conflict with bicycle traffic.
- Shoulder bikeways – This bicycle facility consists of roadways with paved shoulders to accommodate bicycle traffic.
- Bike lanes – A separate lane adjacent to the vehicle travel lane for the exclusive use of cyclists is considered a bike lane.
- Bike paths – These bicycle facilities are exclusive bicycle lanes separated from the roadway.

There are limited bicycle facilities within the study area. Only Lower Harbor Road, Shopping Center Avenue, W. Benham Lane, and Oceanview Drive have designated bicycle lanes. Bicycle paths exist parallel to US 101 from Harris Beach to Crissey Circle and along Railroad Street from Wharf Street to Oak Street. US 101 within the study area is classified as a Statewide Bicycle Route in the Oregon Statewide Bicycle Plan. More specifically, US 101 is known as the Oregon Coast Bike Route. Although there are no designated bicycle lanes on US 101, there is generally sufficient shoulder space for cyclists to travel safely. Figures 3-4 and 3-5 show the existing bike routes and bike lanes located within Brookings and the UGB.

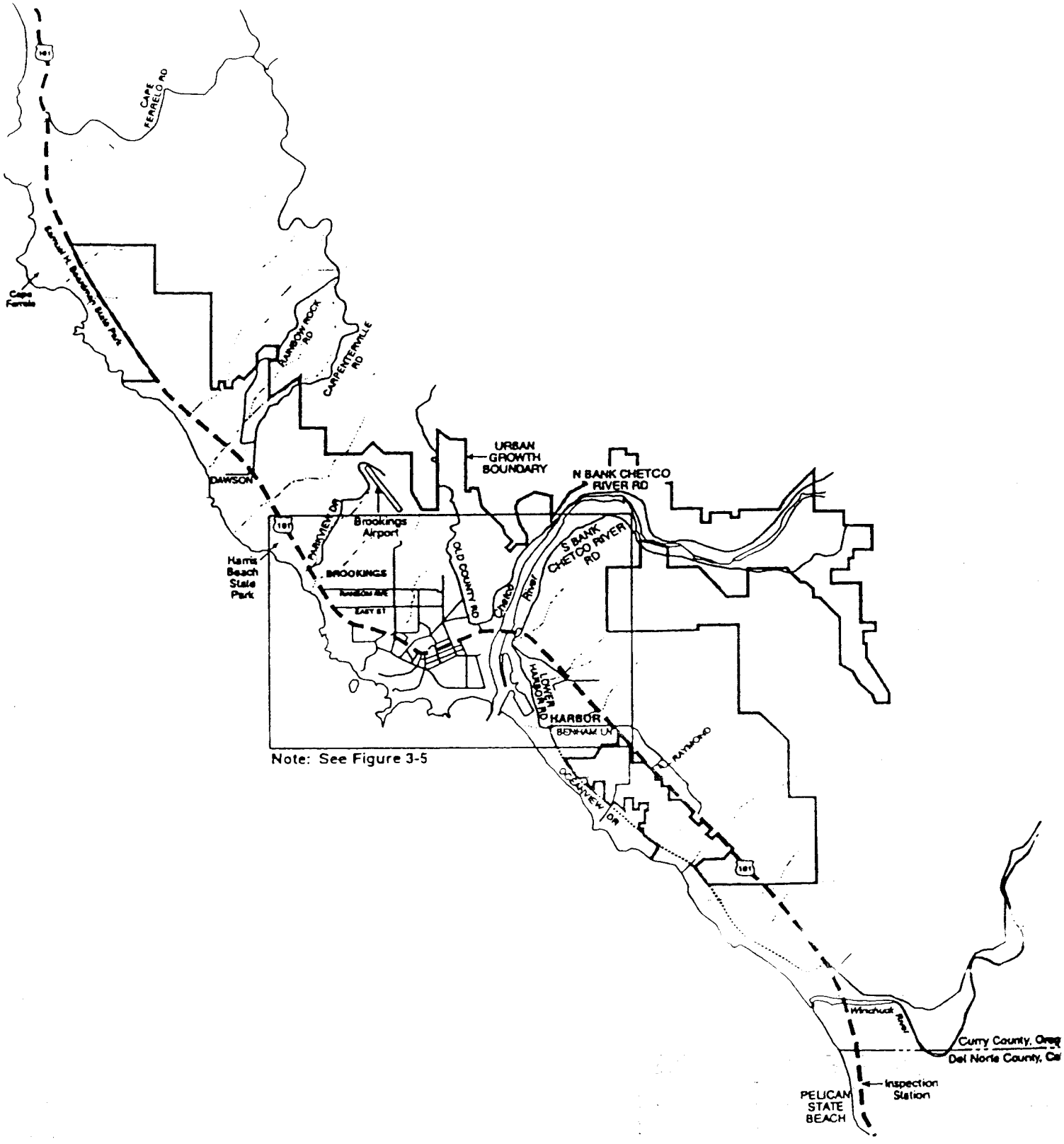
PARKING

The public survey conducted for the South Coast Transportation Study revealed that almost half of respondents (44 percent) identified the need for additional parking within downtown Brookings as very important, second in importance only to improved street maintenance. The on-street parking supply generally serves retail businesses adjacent to US 101, downtown employers, tourists, and nearby residential uses. During the peak summer months, the available parking supply is considered deficient. An inventory of the downtown parking supply revealed that there are 363 on-street parking spaces.



Source: South Coast Transportation Study
Prepared by Parametrix, Inc., May 1996

Figure 3-3
Sidewalk Locations



N

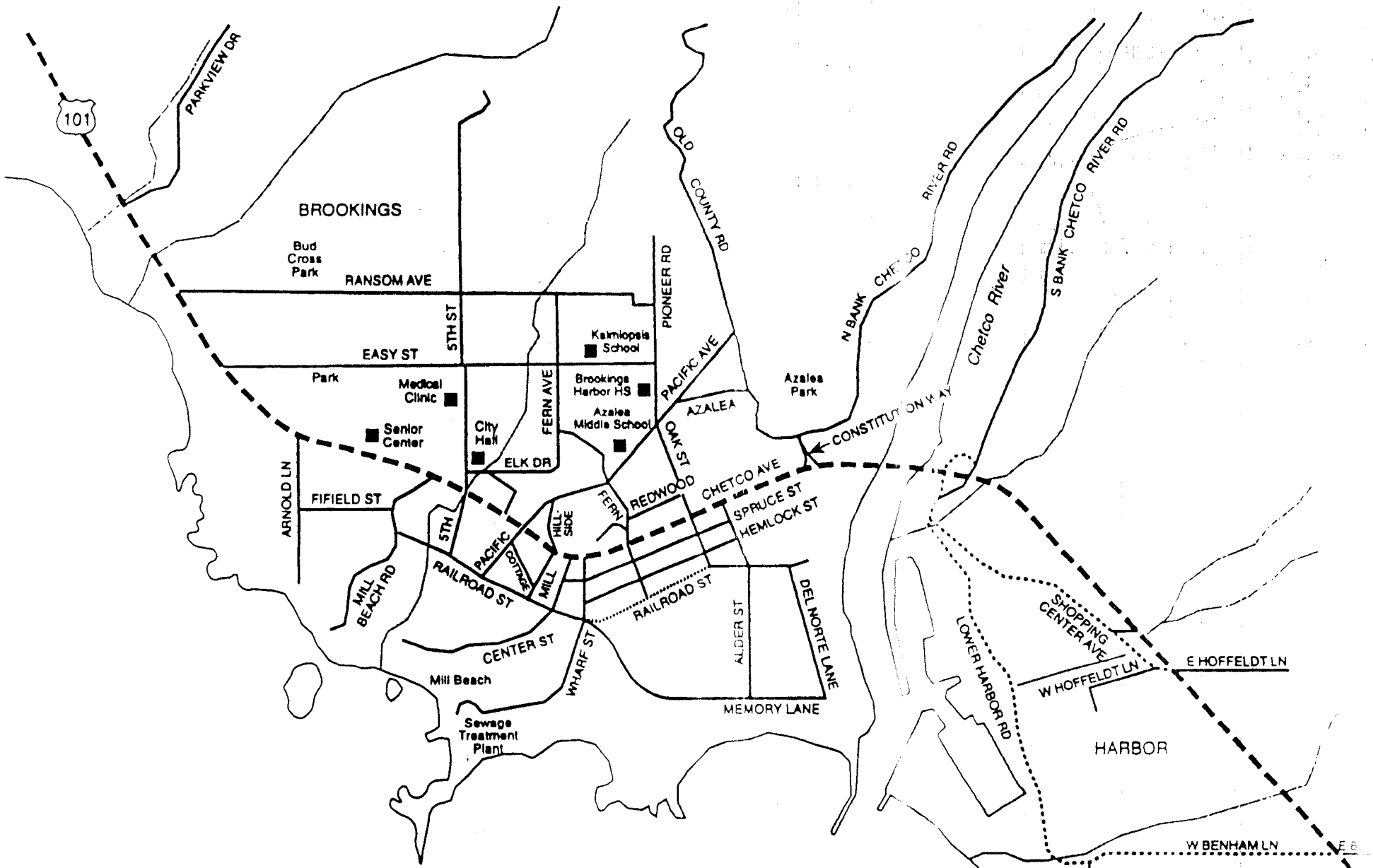
NOT TO SCALE

Bike Route

Bike Lane

Source: South Coast Transportation Study
Prepared by Parametrix, Inc., May 1996

Figure 3-4
Bicycle Route and Lane Location, Brookings UGA



Source: South Coast Transportation Study
Prepared by Parametrix, Inc., May 1996

Figure 3-5
Bicycle Route and Lane Location, City of Brookings

PUBLIC TRANSPORTATION

Currently, Greyhound operates the only commercial bus service in this corridor and the only inter-city service to California. There are four scheduled buses per day, two northbound and two southbound along US 101. Service to Portland, Oregon and San Francisco are available. Intermediate destinations enroute to major cities are also available. Curry County Transit provides inter-city service to Gold Beach, Port Orford, and Bandon in Coos County. Connections to Coos Bay are available in Bandon.

Door-to-door dial-a-ride paratransit service is offered in the Brookings-Harbor area by a private non-profit operator. The geographic service area extends seven miles north of Brookings and seven miles south of Harbor. Service is typically provided for seven and one half to eight hours per day, Monday through Friday. No service is available on weekends or legal holidays. Occasional service is provided for groups outside of these service periods. Service is available to the general public, but is primarily used by seniors and disabled people. Major destinations served include shopping centers, the Medical Center, and the Senior Center. Dispatching for service calls is provided on a volunteer basis and is based at the Senior Center.

The system is currently operated with two mini-vans, a nine-passenger Ford and a seven-passenger Dodge. The Ford is wheelchair lift-equipped but does not fully meet ADA standards. The newer Dodge (1994 model) is fully ADA accessible. A third vehicle has been used in the past as a veteran's escort.

Taxi service is also provided by two private companies serving the Brookings area.

RAIL SERVICE

There are no rail lines or rail service in the Brookings area.

AIR SERVICE

Brookings Airport is located immediately north of the city within the Brookings Urban Growth Area. The Brookings Airport has been jointly developed by the State of Oregon Aeronautics Division and Curry County. The airport is classified as a public access, general aviation facility with no commercial service available. The closest available commercial air transportation services are located in Crescent City, California and Coos Bay/North Bend, Oregon. The airport has a 2,900 foot asphalt runway with a wind indicator, runway lights, and a beacon and is designed to accommodate aircraft with approach speeds of 121 knots and a wing span up to 49 feet. Only visual flight rule approach and departure procedures apply. The only existing access to the Brookings Airport is Parkview Drive which has not been engineered to current standards. The road is winding, narrow, and requires low speeds.

The Brookings Airport Master Plan Update was prepared by Reid Middleton for the Oregon Aeronautics Division of the Oregon Department of Transportation in August 1991. The report reviews existing facilities, predicts future demands on those facilities, establishes a phased schedule (to 2010) and discusses funding for capital projects that will be needed to meet the projected demand.

The state Continuous Aviation System Plan recommends development of a nonprecision GPS approach at the Brookings Airport. Other recommendations include an Automatic Surface Observation Station (ASOS) to improve weather reporting capabilities, and a runway extension to 5,410 feet to meet FAA guidelines. In addition, the FAA has a Capital Improvements Program for the airport. These projects are listed in Chapter 7.

PORT FACILITIES

The Port of Brookings-Harbor is located on the east bank of the Chetco River, south of US 101, within the Brookings Urban Growth Area in unincorporated Curry County. Because of the bluffs that parallel the coastline north and south of the Chetco River, the Port provides the main beach and ocean access in the Brookings-Harbor area and is the primary destination for marine activities in southern Curry County. Facilities include two jetties, boat ramp, two boat basins, a barge slip and turning basin, and a maintained entrance during daylight hours and high tide. Access to the Port is provided by Lower Harbor Road which has direct access to US 101.

Major uses at the Port are:

- sport fishing and support uses
- commercial fishing and support uses
- visitor-oriented commercial facilities
- community facilities and public uses
- light industrial development
- RV parks (3 on Lower Harbor Road and Boat Basin Road)
- Coast Guard Station

The Master Plan call for four land uses which are appropriate and supportable, based on the site analysis and market research: sport fishing (and support uses); commercial fishing (and support uses); visitor-oriented commercial facilities; and, community facilities and public uses. As part of the Master Plan, the Port of Brookings plans to create a boardwalk and retail commercial center adjoining the existing marina. Since it is uncertain what the demand for this space will be, the development proposal recommends constructing the boardwalk and retail commercial center in phases. The initial phase would consist of 5,000 to 7,000 square feet of space representing five or six small retail stores. The project at full build out may provide up to 45,500 square feet of retail space. The types of stores that may be a part of the initial phase of development are gift shops, stores of commercial fishing heritage, take-out deli, and a gallery. The second phase may include a quality restaurant, office space, more specialty stores, and a museum. Support from both local residents and tourists will determine the success and exact nature of this complex.

PIPELINE SERVICE

There are currently no pipelines serving Brookings.

EXISTING DEFICIENCIES

The following deficiencies exist within the local roadway system of the study area:

The lane widths of the following collectors are sub-standard with lane widths of 10 feet or less.

- Old County Road throughout the study area.
- Carpenterville Road between US 101 and Cape Ferrelo Road.
- Easy Street between US 101 and Fern Avenue.
- Pelican Bay Drive (an existing private road) is a half-width street for its entire length between intersections with US 101.

US 101 has an excessive number of driveways for an arterial. Many of these driveways are very closely spaced. Both factors significantly reduce the capacity of the arterial.

Parkview Drive to the Brookings Airport is currently in a deficient roadway condition. The road is narrow, winding, and requires low speeds. To improve access to the airport, Parkview will require significant realignment and improvement or an alternative access route must be built.

The sidewalk network is generally disjointed, with missing connections between sidewalks, which may discourage pedestrian travel, particularly where connections between neighborhoods and schools are lacking. Examples of missing sidewalk locations are:

- Ransom Avenue, with intermittent sidewalks along the entire length.
- Pioneer Road, with missing sidewalks between Easy Street and Ransom Avenue which would connect to the Ransom Avenue sidewalk.
- Easy Street, with missing sidewalk along Kalmiopsis School frontage between Pioneer Road and Fern Street.
- North side of US 101, with missing sidewalk between Alder Street and Hall Way.

Bicycle lanes in the study area are located on a limited number of roadways.

There is limited transit service in the study area. As the retirement population in the Brookings-Harbor area increases, additional transit service will be needed to serve the retirement community.

Public opinion from the South Coast Transportation Study survey indicated a perceived need for improved street maintenance and repair within the City of Brookings and Curry County.

The public survey also indicated a perceived need for additional downtown parking and for more traffic controls to facilitate access and reduce speeding.

CHAPTER 4: CURRENT TRANSPORTATION CONDITIONS

As part of the planning process for the Brookings Transportation Study, the current operating conditions for the transportation system were evaluated by Parametrix, Inc. This evaluation focused primarily on street system operating conditions since the automobile is by far the dominant mode of transportation in Brookings.

TRAFFIC VOLUMES

Morning and afternoon peak hour traffic volumes were collected by ODOT and Parametrix Inc. in November/December 1994 and April/July 1995. These traffic volumes were adjusted by balancing adjacent link volumes and applying seasonal factors from ODOT's 1993 Traffic Volume Tables. Additional counts were taken by ODOT at selected locations in the summer of 2001 in order to provide a more complete analysis of some intersections.

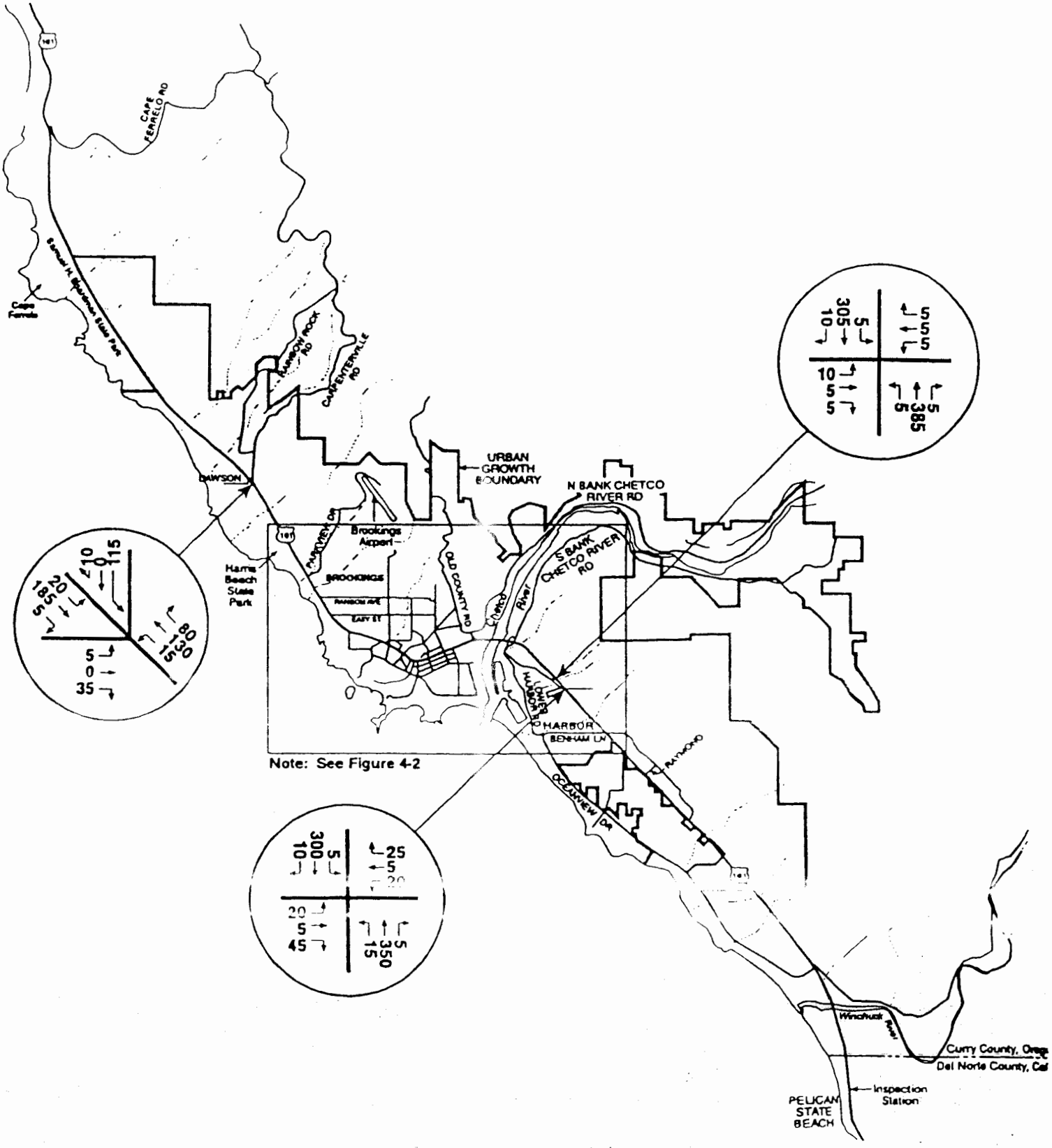
The seasonal adjustment factors were derived from a permanent count station located on US 101 approximately one mile north of the Oregon-California border. These seasonal factors are summarized in Table 4-1.

TABLE 4-1
SEASONAL TRAFFIC ADJUSTMENT FACTORS, 1993

Month	Seasonal Adjustment Factors
January	1.16
February	1.15
March	1.10
April	1.11
May	1.00
June	0.93
July	0.80
August	0.79
September	0.88
October	1.03
November	1.11
December	1.15

The AM peak hour traffic volumes are shown in Figures 4-1 and 4-2. Figures 4-3 and 4-4 show the PM peak hour traffic volumes.

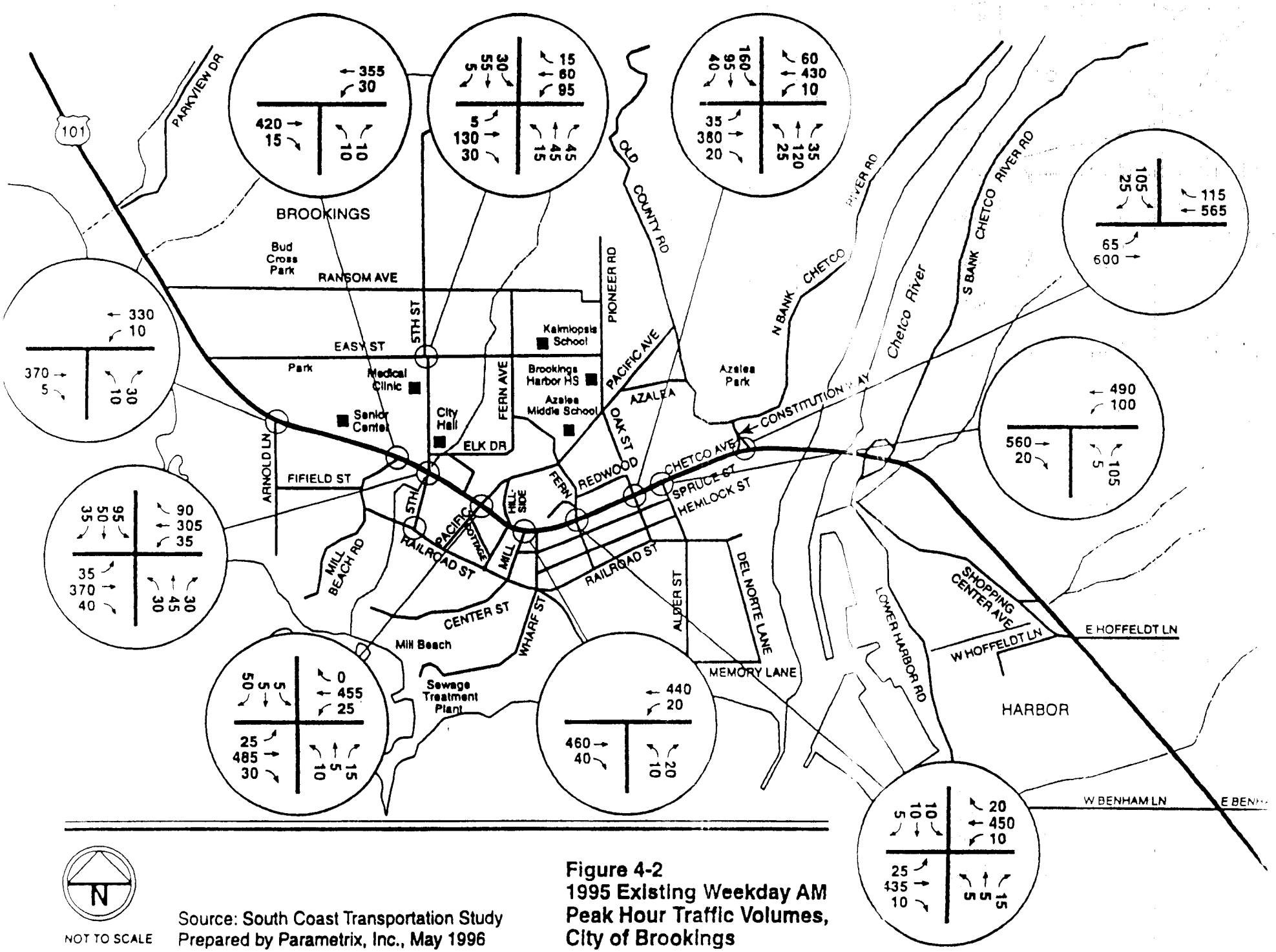
Existing average daily traffic volumes on US 101 were obtained from ODOT's 1996 Traffic Volume Tables and the Curry County Road Department. In addition, Parametrix, Inc. collected daily traffic volumes through the study area in November and December 1994. These daily traffic volumes were also adjusted for seasonal variations with the same adjustment factors used to adjust the AM and PM peak hour traffic volumes. Figures 4-5 and 4-6 show the existing weekday daily traffic volumes.



NOT TO SCALE

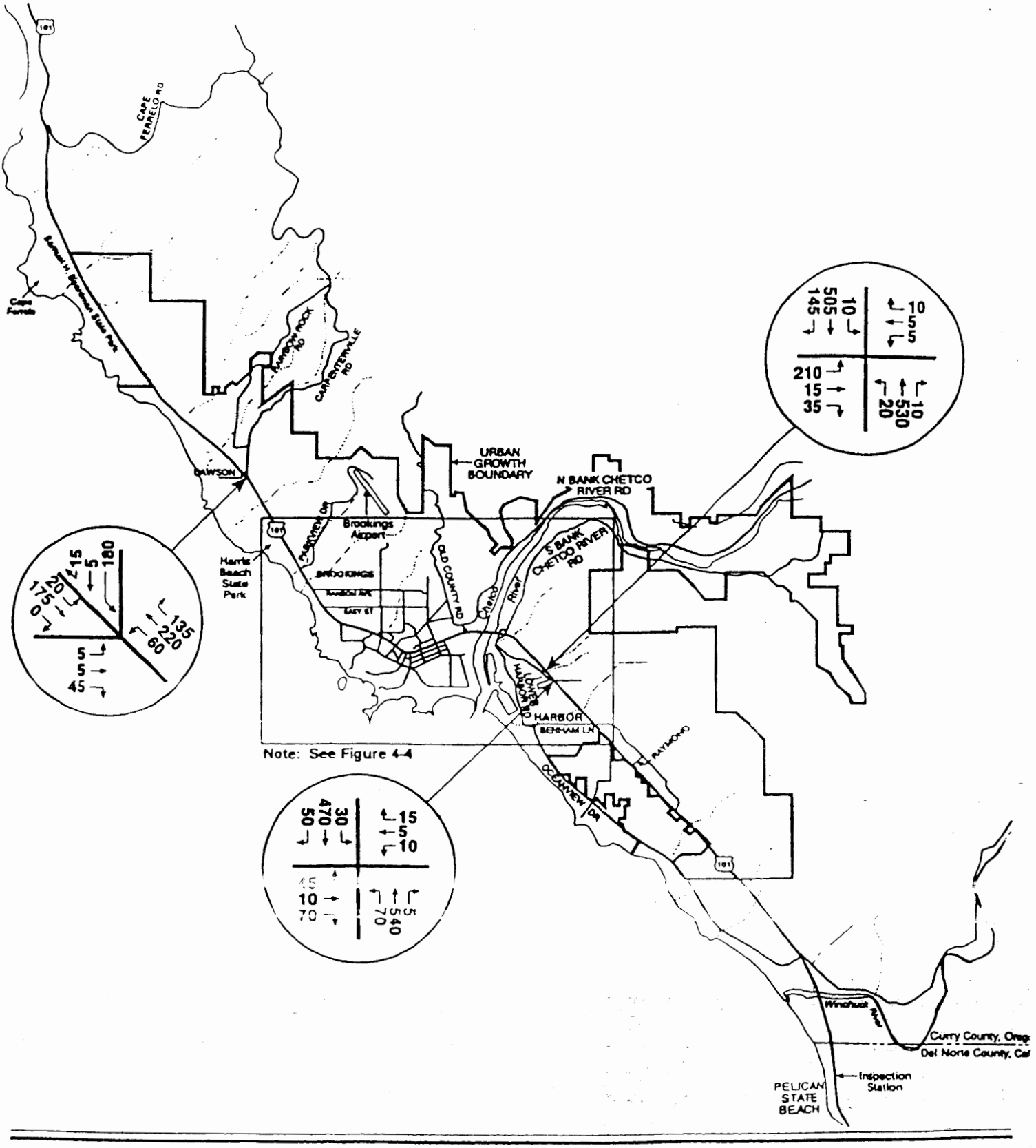
Source: South Coast Transportation Study

Figure 4-1
1995 Existing Weekday AM Peak Hour Traffic Volumes, City of Brookings, UGA



Source: South Coast Transportation Study
Prepared by Parametrix, Inc., May 1996

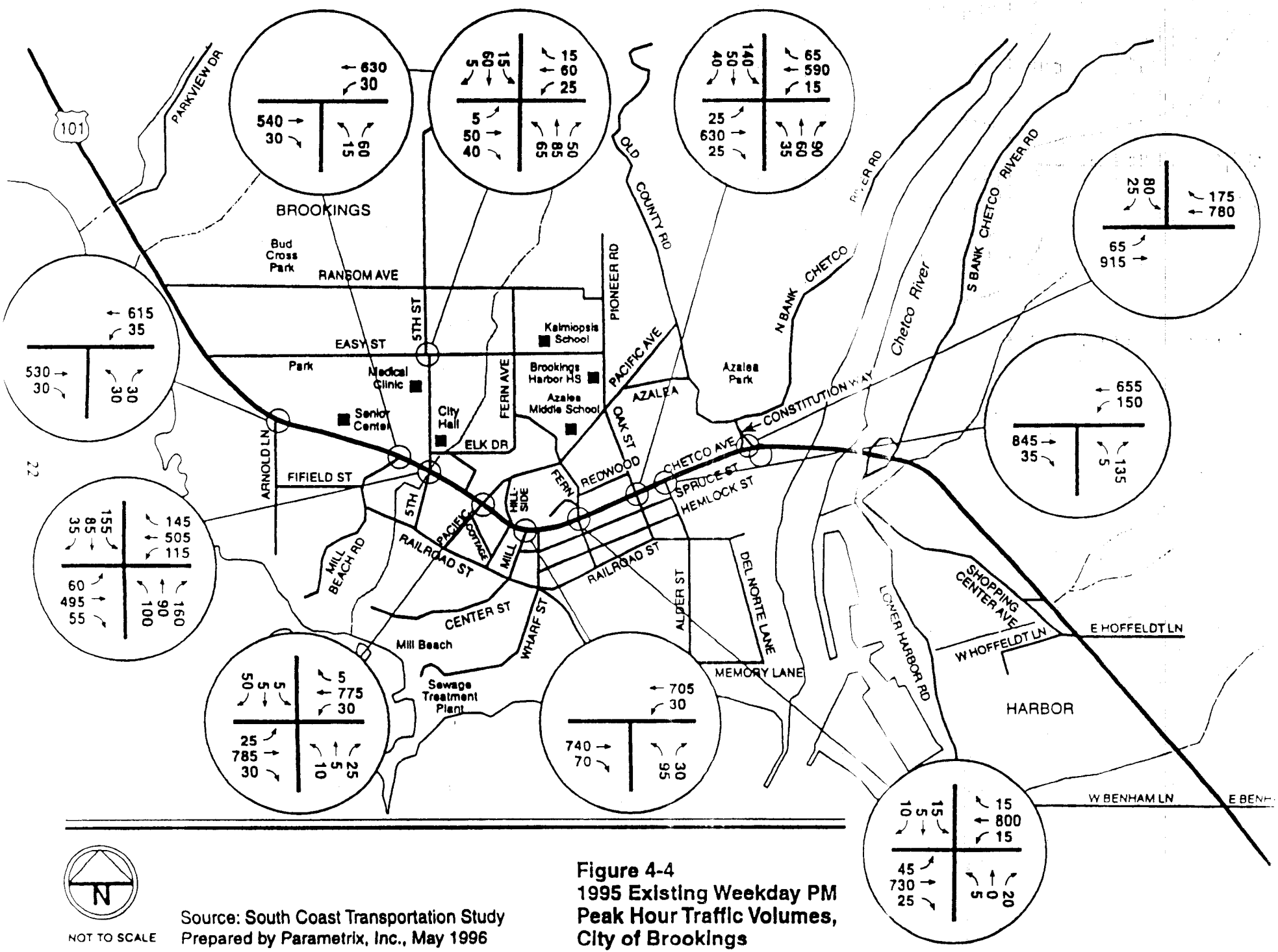
Figure 4-2
1995 Existing Weekday AM Peak Hour Traffic Volumes, City of Brookings



NOT TO SCALE

Source: South Coast Transportation Study
Prepared by Parametrix, Inc., May 1996

Figure 4-3
1995 Existing Weekday PM Peak Hour Traffic Volumes, Brookings UGA



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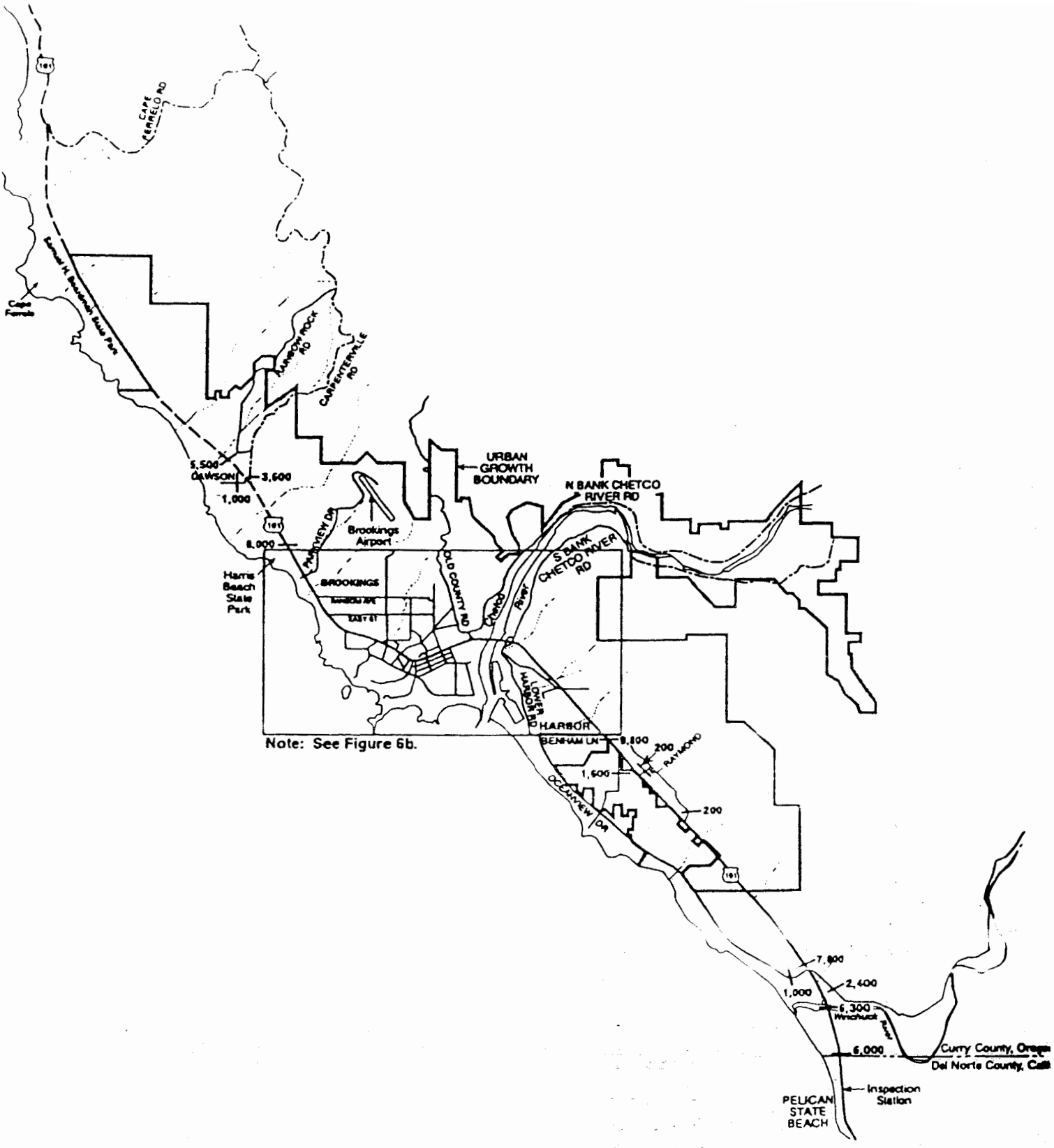
NOT TO SCALE

Source: South Coast Transportation Study
Prepared by Parametrix, Inc., May 1996

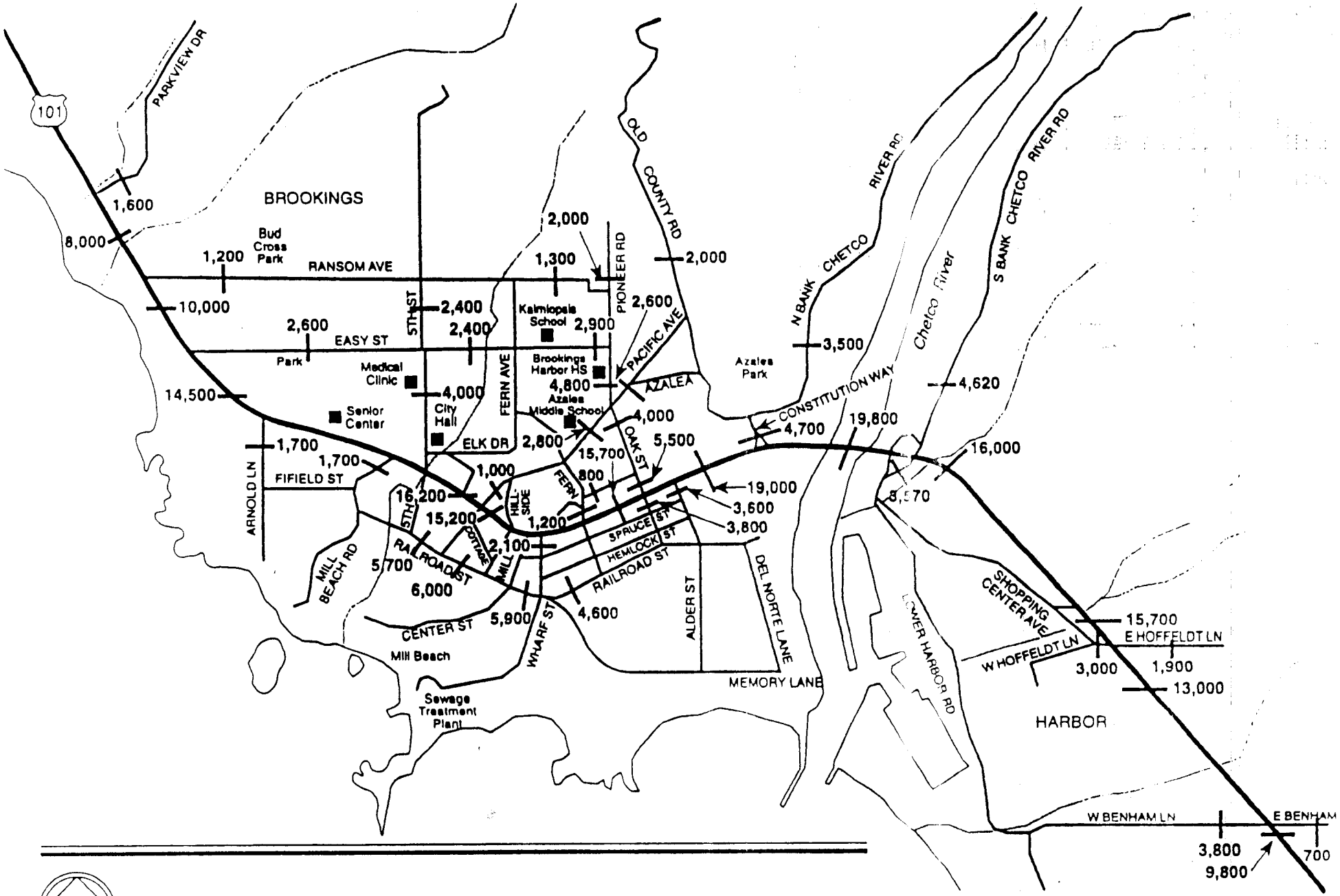
Figure 4-4
1995 Existing Weekday PM Peak Hour Traffic Volumes, City of Brookings



NOT TO SCALE

Source: 1996 Transportation Volume Tables, ODOT, June 1997

Figure 4-5
1996 Average Daily Traffic Volumes, Brookings UGA



NOT TO SCALE

Source: South Coast Transportation Study
Prepared by Parametrix, Inc., May 1996
and 1996 Transportation Volume Tables,
ODOT, June 1997

Figure 4-6
1996 Average Daily Traffic Volumes,
City of Brookings

As shown on Figure 4-5, the average daily traffic volumes on US 101 range from 5,200 to 18,000. The lowest daily volumes on US 101 occur just north of Carpenterville Road. The highest daily traffic volumes on US 101 occur over the Chetco River Bridge.

The daily traffic volumes on the city streets range from 700 to 5,700. This range of traffic volumes on the city streets can be seen on Figure 4-6.

LEVEL OF SERVICE

The following section provides a summary of the level of service (LOS) analysis conducted for the Brookings urban growth boundary intersections and roadways. The level of service definition, methodologies wed in calculating level of service, and the results of the analysis are summarized below. The purpose of this information is to provide an overview of LOS and to identify its relationship to the transportation goals and policies of the city.

Level of Service Definition

Level of service (LOS) is an estimate of the quality and performance of transportation facility operations in a community. One commonly used method is the Transportation Research Board's 1997 Highway Capacity Manual (HCM) LOS system. The degree of traffic congestion and delay is rated using the letter "A" for the least amount of congestion to the letter "F" for the highest amount of congestion. This method is used for evaluating the local street system. An alternative method, described below, is used for evaluating performance on state highways.

The following Level of Service categories provide general descriptions of the different levels of service defined in the 1997 Highway Capacity Manual. The community decides what level of traffic congestion is tolerable on local streets (i.e., decides whether "C," "D," or some other level). Performance on state roadways is set through by state policy and can only be altered in special cases discussed below. The choice of a particular LOS threshold on local streets can vary by planning subarea, roadway classification, or specific corridor or street.

The level of service methodology for unsignalized intersections was based on average delay for critical turning movements. Level of service values range from LOS A, indicating free-flowing traffic, to LOS F, indicating extreme congestion and long vehicle delays. Table 4-2 summarizes the relationship between level of service and average delay at unsignalized intersections.

TABLE 4-2
LEVEL OF SERVICE CRITERIA FOR NON-HIGHWAY UNSIGNALIZED INTERSECTIONS

Level of Service	Average Delay (seconds per vehicle)	Expected Delay
A	<10.0	Little or no delay
B	> 10.0 < 15.0	Short delays
C	> 15.0 <25.0	Average delays
D	> 25.0 < 35.0	Long delays
E	> 35.0 < 50.0	Very long delays
F	>50.0	Failure - extreme congestion

The 1997 Highway Capacity Manual (HCM) level of service methodology for signalized intersections is based on average delay experienced by all vehicles as they approach the intersection. Table 4-3 summarizes the relationship between level of service and average delay at signalized intersections.

TABLE 4-3
LEVEL OF SERVICE CRITERIA FOR NON-HIGHWAY SIGNALIZED INTERSECTIONS

Level of Service	Average Delay (seconds per vehicle)	Expected Delay
A	≤ 10.0	Little or no delay
B	$> 10.0 \leq 20.0$	Short delays
C	$> 20.0 \leq 35.0$	Average delays
D	$> 35.0 \leq 55.0$	Long delays
E	$> 55.0 \leq 80.0$	Very long delays
F	>80.0	Failure - extreme congestion

Although the 1997 Highway Capacity Manual has a specific methodology for urban and suburban principal arterials, this methodology was not used because of its limitation in analyzing segments between signalized intersections with speeds greater than 25 mph, as is the case on Brookings. In the Brookings urban growth boundary, there are six traffic signals. The 1997 HCM methodology is not calibrated for principal arterials with speeds at 25 mph with signals spaced greater than one-quarter mile apart. Therefore, an alternative methodology still consistent with the HCM and the previously conducted South Coast Transportation Plan, was utilized. Level of service at the roadway mid-blocks was calculated based on correlating the volume to capacity ratio (V/C) to LOS values. Table 4-4 summarizes the volume-to-capacity ratio ranges that have been developed for determining planning level roadway mid-block LOS on local urban and rural roadways.

TABLE 4-4
LEVEL OF SERVICE CRITERIA FOR LOCAL (NON-HIGHWAY) ROADWAY MID-BLOCKS

Level of Service	Description	Volume/Capacity (V/C) Ratio
A	less than or equal to	0.60
B	less than or equal to	0.70
C	less than or equal to	0.80
D	less than or equal to	0.90
E	less than or equal to	1.00
F	Greater than	1.00

Performance on State Facilities

The Oregon Highway Plan (OHP) defines minimum highway mobility standards for various state highway classifications using maximum volume to capacity (V/C) ratio thresholds by facility type. The OHP defines a volume to capacity ratio as the peak hour traffic volume (vehicles per hour) on a highway section divided by the maximum volume that highway section can handle. Table 4-5 outlines Oregon Highway Plan performance standards for State highways found in or near Brookings at the time of adoption of this TSP—specifically for US 101, a Statewide Highway, and Carpenterville Road, a District Highway. The table shows standards for signalized intersections and for turns from the highway to the local road at unsignalized intersections. Turns at an unsignalized stop from a local road onto a state highway must operate at or below a V/C ratio of 0.85. Roadway segments (i.e. not specific intersection locations) are to operate at the V/C ratio specified in the Highway Plan for intersections on similar highway category and characteristic; 0.80 for segments through the city of Brookings.

The standards shown in Table 4-5 are provided for clarification only and reflect the Oregon Highway Plan standards in affect at the time of adoption of the TSP. The Highway Plan standards are adopted by reference as the performance measures to be used when evaluating mobility on State roadways. Should the standards in the Oregon Highway Plan be amended or changed subsequent to adoption of this local plan, the new Highway Plan standards will be used to determine performance on the State highways and the standards in Table 4-5 shall be updated or disregarded.

TABLE 4-5
PERFORMANCE STANDARDS FOR STATE HIGHWAYS IN THE BROOKINGS AREA

HIGHWAY CATEGORY	Specific Highway	Inside UGB			Outside UGB
		Speed <45 mph	Speed >=45 mph	STA[1]	Rural Lands
Signalized Intersections and Unsignalized Turns from Highways onto Local Roads					
Statewide (NHS) Non-Freight Route	US 101	0.80	0.75	0.90	0.70
District/Local Interest Roads	Carpenterville Road	0.85	0.80	0.95	0.70
Unsignalized Turns from Local Roads onto Highways					
All Highway Categories	US 101; Carpenterville Road	0.85	0.85	0.95	0.80

Source: 1999 Oregon Highway Plan

[1] Special Transportation Area—Specific area of concern, which must meet Highway Plan criteria and must be designated through cooperative effort by both the participating city and ODOT.

Existing Level of Service

Based on current AM peak hour, PM peak hour, and daily traffic volumes, level of service was calculated for the study area intersections and roadway mid-blocks. The results of the unsignalized and signalized intersection level of service analysis are summarized in Tables 4-6 and 4-7, respectively. The results of the roadway mid-block level of service are summarized in Table 4-8 for arterial/collector streets and Table 4-9 for local streets. For those intersections on US 101 and Carpenterville Road, V/C ratios are reported and are used in the evaluation of existing and projected performance.

TABLE 4-6
EXISTING UNSIGNALIZED INTERSECTION LEVELS OF SERVICE

Unsignalized Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Average Delay	V/C	LOS	Average Delay	V/C
US 101/Carpenterville Road/Dawson Road						
Northbound Left Turn	A	7.7	0.01	A	7.7	0.05
Southbound Left Turn	A	7.7	0.02	A	8.2	0.02
Eastbound Approach	B	10.0	0.06	A	11.1	0.09
Westbound Approach	C	15.8	0.30	C	39.0	0.70
US 101-Chetco Avenue/Arnold Lane						
Northbound Left Turn	A	8.2	0.01	A	8.9	0.04
Eastbound Approach	B	11.0	0.07	D	18.4	0.20
US 101-Chetco Avenue/Mill Beach Road						
Northbound Left Turn	A	8.5	0.03	A	8.9	0.04
Eastbound Approach	B	13.0	0.05	C	14.1	0.17
US 101-Chetco Avenue/Pacific Avenue						
Northbound Left	A	8.7	0.03	B	10.0	0.04
Southbound Left	A	8.5	0.03	A	9.8	0.04
Eastbound Approach	C	18.6	0.11	E	38.1	0.29
Westbound Approach	B	13.2	0.13	D	23.7	0.26
US 101-Chetco Avenue/Fern Avenue						
Northbound Left	A	8.4	0.01	A	9.6	0.02
Southbound Left	A	8.6	0.03	B	10.2	0.07
Eastbound Approach	C	15.0	0.07	C	20.2	0.11
Westbound Approach	C	20.6	0.11	F	52.6	0.31
US 101-Chetco Avenue/Alder Street						
Northbound Left Turn	A	9.4	0.12	B	11.7	0.24
Eastbound Approach	B	12.6	0.20	C	18.3	0.37
US 101-Chetco Avenue/Constitution Way						
Southbound Left Turn	A	9.6	0.08	B	11.2	0.11
Westbound Right Turn	B	11.1	0.04	B	12.7	0.06
Westbound Left Turn	F	91.9	0.81	F	>100.0	1.07

TABLE 4-7
EXISTING SIGNALIZED INTERSECTION LEVELS OF SERVICE

SIGNALIZED INTERSECTION	LOS	Average Delay	V/C Ratio	LOS	Average Delay	V/C Ratio
US 101-Chetco Ave/5th St						
Northbound Left	D	35.9	0.18	D	48.8	0.59
Northbound Right/Through	B	16.0	0.29	C	25.8	0.59
Southbound Left	D	35.9	0.18	A	4.9	0.31
Southbound Right/Through	B	16.1	0.29	C	24.1	0.49
Eastbound Left	C	34.7	0.14	D	40.4	0.43
Eastbound Right/Through	D	37.6	0.39	D	48.6	0.76
Westbound Left	D	37.3	0.45	D	49.7	0.67
Westbound Right/Through	D	38.1	0.44	C	34.1	0.37
Overall	C	22.5	0.32	C	31.8	0.65
US 101-Chetco Ave/Center St						
Northbound Left/Through	A	2.7	0.21	A	5.1	0.36
Southbound Right/Through	A	2.7	0.22	A	5.1	0.36
Westbound Left/Right	C	25.4	0.20	D	37.9	0.47
Overall	A	3.5	0.21	A	7.6	0.38
US 101-Chetco Ave/Oak St						
Northbound Approach	B	14.9	0.44	B	17.7	0.49
Southbound Approach	B	14.5	0.40	B	18.0	0.51
Eastbound Approach	D	40.7	0.74	E	67.7	0.86
Westbound Approach	D	38.2	0.82	D	39.2	0.66
Overall	C	22.9	0.62	C	25.9	0.61
US 101/Shopping Center Ave						
Northbound Left	C	22.7	0.03	D	39.3	0.12
Northbound Right/Through	A	7.5	0.23	B	17.1	0.37
Southbound Left	C	22.7	0.03	D	38.9	0.06
Southbound Through	A	7.3	0.18	B	16.9	0.35
Southbound Right	A	6.6	0.01	B	15.8	0.22
Eastbound Left/Through	C	22.9	0.08	C	29.9	0.59
Eastbound Right	C	22.7	0.03	C	23.3	0.08
Westbound Left/Through	C	22.8	0.05	C	22.9	0.02
Westbound Right	C	22.7	0.03	C	22.9	0.02
Overall	A	8.4	0.17	B	19.5	0.42
US 101/Hoffeldt Lane						
Northbound Left	C	22.9	0.07	D	37.3	0.36
Northbound Right/Through	A	7.4	0.21	B	10.8	0.31
Southbound Left	C	22.7	0.03	D	35.7	0.15
Southbound Right/Through	A	7.3	0.18	B	10.7	0.30
Eastbound Approach	C	25.5	0.43	D	35.3	0.54
Westbound Approach	C	24.5	0.31	C	30.6	0.13
Overall	B	10.4	0.22	B	15.5	0.37

The intersection of US 101 and Benham Lane was omitted from the original analysis. ODOT completed current traffic counts and capacity analysis for the TSP in August 2001. The result of this analysis show the intersection to be operating within acceptable standards.

In all the level of service tables, US 101 is considered to be oriented north-south throughout the entire study area although there are several sections oriented east-west. All other roadways are oriented based on their compass direction.

Table 4-6 shows that, with one exception, all of the unsignalized intersections are operating at well within the standards set in the OHP. However, the left-turn movement from Constitution Way to US 101-Chetco Avenue operates at a V/C of .81 in the AM peak hour and 1.07 in the PM peak hour, the latter being beyond acceptable standards. The following three unsignalized intersections have movements operating at or below LOS D in the PM peak hour, although V/C ratios for all are within acceptable limits:

- US 101/Carpenterville Road/Dawson Road–Westbound approach;
- US 101-Chetco Avenue/Pacific Avenue –Eastbound approach;
- US 101-Chetco Avenue/Fern Avenue –Eastbound approach.

The conditions at the four unsignalized intersections are primarily caused by heavy traffic volumes on US 101-Chetco Avenue making turns from the local street difficult.

As shown in Table 4-7, all the signalized intersections within the study area are within acceptable V/C and LOS standards for the overall intersection. However, the east and westbound intersection movements at Oak Avenue exceed the 1999 OHP V/C standard; the eastbound movement in the PM and the westbound in the AM.

Tables 4-8 and 4-9 show performance for roadway segments rather than specific intersections. Arterial, collector, and local street levels of service range from LOS A to LOS C. Only Pioneer Road north of Pacific Avenue is operating at LOS C; all other roadway segments within the study area are operating at LOS A or B. All US 101 segments operate within acceptable V/C limits.

TABLE 4-8
EXISTING ARTERIAL/COLLECTOR ROADWAY LEVEL OF SERVICE SUMMARY

Roadway	Section	AADT	Capacity	LOS	V/C Ratio
US 101	N. of Carpenterville Rd	5,200	16,000	A	0.31
	North of Parkview Drive	7,700	16,000	A	0.48
	South of Ransom Avenue	10,000	16,000	B	0.63
	South of Easy Street	12,000	24,000	A	0.50
	North of Pacific Avenue	15,000	24,000	B	0.63
	South of Pacific Avenue	16,000	24,000	B	0.67
	North of Oak Street	16,000	24,000	B	0.67
	South of Alder Street	17,000	24,000	C	0.71
	Chetco River Bridge	18,000	37,000	A	0.49
	South of S. Bank Chetco River Road	15,000	29,000	A	0.52
		13,000	29,000	A	0.45
	North of Hoffeldt Lane	12,000	26,000	A	0.46
	South of Hoffeldt Lane	9,900	26,000	A	0.38
	North of Benham Lane	7,700	16,000	A	0.48
	North of Oceanview Drive	7,300	16,000	A	0.46
	Winchuck River Bridge	7,000	16,000	A	0.44
	North of OR-CA Border				
Carpenterville Road	East of US 101	3,600	10,000	A	0.36
N. Bank Chetco River Rd	North of US 101	3,300	10,000	A	0.33
S. Bank Chetco River Rd	North of US 101	4,400	14,500	A	0.30
Easy Street	West of 5th Street	2,400	6,000	A	0.40
	East of 5th Street	2,200	6,000	A	0.37
	West of Pioneer Road	2,700	6,000	A	0.45
Lower Harbor Road	West of US 101	3,400	10,000	A	0.34
Benham Lane	West of US 101	3,600	6,000	A	0.60
Oceanview Drive	West of US 101	1,000	6,000	A	0.17
Winchuck River Road	East of US 101	2,400	10,000	A	0.24
Pacific Avenue	East of Fern Avenue	2,600	6,000	A	0.43
Old County Road	South of Marine	1,900	6,000	A	0.32
Constitution Way	North of US 101-Chetco Avenue	4,400	10,000	A	0.44
Railroad Street	North of Wharf Street	5,600	10,000	A	0.56
	South of Wharf Street	4,300	10,000	A	0.43
	North of Pacific Avenue	5,400	10,000	A	0.54
	South of Pacific Avenue	5,700	10,000	A	0.57
Pioneer Road	North of Pacific Avenue	4,500	6,000	C	0.75
Oak Street	South of Pacific Avenue	3,800	10,000	A	0.38
	North of US 101-Chetco Avenue	5,200	10,000	A	0.52
	South of US 101-Chetco Avenue	3,600	10,000	A	0.36

TABLE 4-9
EXISTING LOCAL STREET LEVEL OF SERVICE SUMMARY

Roadway	Section	AADT	Capacity	LOS	V/C Ratio
5th Street	North of Easy Street	2,200	6,000	A	0.37
	South of Easy Street	3,800	6,000	B	0.63
Alder Street	South of US 101-Chetco Avenue	3,400	6,000	A	0.57
Arnold Way	South of US 101-Chetco Avenue	1,600	6,000	A	0.27
Benham Lane	East of US 101	600	6,000	A	0.10
Dawson Road	West of US 101	1,000	5,000	A	0.40
Fern Avenue	North of US 101-Chetco Avenue	1,100	6,000	A	0.18
Hoffeldt Lane	East of US 101	1,800	6,000	A	0.30
	West of US 101	2,800	6,000	A	0.47
Mill Beach Road	West of US 101-Chetco Avenue	1,600	6,000	A	0.27
Pacific Avenue	East of Pioneer Road	2,400	6,000	A	0.40
	North of US 101-Chetco Avenue	900	6,000	A	0.15
Parkview Drive	East of US 101-Chetco Avenue	1,500	6,000	A	0.25
Pedrioli Drive	West of US 101	1,600	5,000	A	0.32
Pelican Bay Drive	East of US 101	200	500	A	0.40
Pioneer Road	South of Hasset Street	1,900	6,000	A	0.32
Ransom Avenue	East of US 101-Chetco Avenue	1,100	6,000	A	0.18
	West of Pioneer Road	1,200	6,000	A	0.20
Raymond Lane	East of US 101	200	500	A	0.40
Redwood Street	East of Fern Avenue	700	6,000	A	0.12
Wharf Street	South of US 101-Chetco Avenue	2,000	6,000	A	0.33

TRANSPORTATION DEMAND MANAGEMENT MEASURES

Transportation Demand Management (TDM) measures consists of efforts taken to reduce the demand on an area's transportation system. TDM measures include such things as alternative work schedules, carpooling, and telecommuting.

Alternative Work Schedules

One way to maximize the use of the existing transportation system is to spread peak traffic demand over 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 4-10). The census indicates that the hour between 8:00 and 9:00 AM is the peak travel hour for employees leaving for work, with 26 percent of total employees departing in that period. A further 25 percent depart between 7:00 and 8:00 AM. Therefore, over half of the Brookings work force leaves for work in a two-hour period. An additional 14 percent leave in the hour following the peak hour.

Assuming an average nine-hour workday, 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.

TABLE 4-10
DEPARTURE TO WORK DISTRIBUTION, BROOKINGS (1990)

Departure Time	Trips	Percent
12:00 AM to 4:59 AM	53	3.2
5:00 AM to 5:59 AM	133	8.1
6:00 AM to 6:59 AM	169	10.3
7:00 AM to 7:59 AM	405	24.7
8:00 AM to 8:59 AM	424	25.9
9:00 AM to 9:59 AM	221	13.5
10:00 AM to 10:59 AM	24	1.5
11:00 AM to 11:59 AM	24	1.5
12:00 PM to 3:59 PM	94	5.7
4:00 PM to 11:59 PM	89	5.4
Total	1,636	100%

Source: US Bureau of Census

TRAVEL MODE DISTRIBUTION

Although the automobile is the primary mode of travel for most residents in Brookings, 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 4-11. The census data reflects the predominant use of the automobile.

Most Brookings residents travel to work via private vehicle. In 1990, 89 percent of all trips to work were in an auto, van, or truck. Trips in single-occupancy vehicles made up 77 percent of all trips, and carpooling accounted for 13 percent. No workers indicated they used a bicycle for transportation to work.

Walking as a means of getting to work was used more frequently than public transportation. Census information indicates that 5.6 percent walked to work, while no one used public transportation to get to work. However, the census does not account for other uses of transportation, such as shopping or recreation. ODOT data shows that 17,965 public transit trips were provided during the fiscal year 1993-94. Of this total, over 85 percent were for senior or disabled people. Based on 253 operating days during this time period, average daily ridership is 71 trips.

TABLE 4-11
JOURNEY TO WORK TRIPS, BROOKINGS (1990)

Mode	Number of Trips	Percent of Total
Car, Truck, or Van:		
Drove alone	1,312	76.6
Carpooled	218	12.7
Public Transportation	0	0.0
Motorcycle	0	0.0
Bicycle	0	0.0
Walked	96	5.6
Other Means	10	.6
Worked at Home	76	4.4
Total	1,712	100.0

Source: US Bureau of Census

ACCIDENT ANALYSIS

Accident data at the study area intersections and roadway segments were obtained from ODOT for the three year, ten month period between January 1, 1994 and December 31, 1996. Table 4-12 summarizes the accident data for roadway segments within the study area. Table 4-13 summarizes the accident data for study area intersections.

The data indicates that the following street segments have the highest accident experience (measured by accidents per million vehicle miles of travel or MVMT):

- Pelican Bay Road, M.P. 0.0 to M.P. 1.0 (4.11 accidents/MVMT)
- Hillside Avenue, US 101 to Pacific Avenue (6.32 accidents/MVMT)
- Oak Street, US 101 to Pacific Avenue Street (3.26 accidents/MVMT)
- Pacific Avenue, US 101 to Fern Avenue (13.24 accidents/MVMT)
- US 101, Arnold Lane to Chetco River Bridge (3.08 accidents/MVMT)

These locations were singled out as high accident locations when compared with the average statewide accident rate of 1.76 accidents/MVMT which was identified in the 1996 State Highway System Accident Rate Tables (ODOT 1995) for non-freeway state facilities. While this accident rate is intended to represent average conditions on state facilities, it is also useful to identify high accident thresholds for other roads. It should be noted that, while these locations have relatively high accident rates in comparison with the statewide average as well as with the accident experience on many other roadway segments in the study area, the actual number of accidents is small for all of these locations with the exception of the US 101 segment between Arnold Lane and the Chetco River Bridge. During the nearly three-year time period studied at each of the four non-US 101 roadway segment locations identified above, there was an average of 1.3 accidents per year or fewer. The high accident rates are predominantly a function of the low traffic volumes on these streets that tend to increase the relative importance of even a single accident.

TABLE 4-12

ROADWAY SEGMENT ACCIDENT SUMMARY (JANUARY 1994-DECEMBER 1996)

Roadway Segment	Average Accidents per Year by Type					Total (acc/yr[1])	Total (acc/mvmt[2])
	Parking	Driveway	Rear End	Pedestrian	Other		
Easy Street							
US 101 to 5th St	0.0	0.3	0.0	0.0	0.0	0.3	0.65
5th St to Fern Ave	0.0	0.3	0.0	0.0	0.0	0.3	0.00
Fern Avenue							
US 101 to Pacific Ave	0.0	0.0	0.0	0.0	0.0	0.0	0.00
Hillside Avenue							
US 101 to Pacific Ave	0.0	0.3	0.0	0.0	0.0	0.3	6.32
Mill Beach Road							
US 101 to Fifield St	0.0	0.0	0.0	0.0	0.0	0.0	0.00
Fifield St to Railroad St	0.0	0.0	0.0	0.0	0.0	0.0	0.00
Oak Street							
US 101 to Pacific Ave	0.0	0.0	1.0	0.0	0.3	1.3	3.26
Pacific Avenue							
US 101 to Fern Ave	0.0	0.7	0.0	0.0	0.3	1.0	13.24
US 101							
Carpenterville Rd to Arnold Lane	0.0	0.0	2.7	0.0	8.3	11.0	0.21
Arnold Ln to Chetco River Bridge	0.3	0.7	6.7	1.6	16.0	25.3	3.08
Chetco River Br. to Pedrioli Dr	0.0	0.0	3.0	0.0	8.7	11.7	1.74
Pedrioli Dr to Camellia Dr	0.0	0.0	0.3	0.0	0.3	0.8	0.12
Camellia Dr to Winchuck River Rd	0.0	0.0	0.4	0.0	2.1	2.9	0.83
North Bank Chetco River Road							
MP 0.0 to MP 1.0	0.0	0.0	0.3	0.0	0.7	1.0	0.83
MP 1.0 to MP 2.0	0.0	0.0	0.0	0.0	1.0	1.0	0.83
MP 2.0 to MP 3.0	0.0	0.0	0.0	0.0	0.3	0.3	0.25
MP 3.0 to MP 4.0	0.0	0.0	0.0	0.0	0.3	0.3	0.25
MP 4.0 to MP 5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
MP 5.0 to MP 6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
South Bank Chetco River Road							
MP 0.0 to MP 1.0	0.0	0.0	0.0	0.0	0.3	0.3	0.19
MP 1.0 to MP 2.0	0.0	0.0	0.0	0.0	1.0	1.0	0.62
MP 2.0 to MP 3.0	0.0	0.0	0.3	0.0	0.7	1.0	0.62
Shopping Center Avenue							
MP 0.0 to MP 1.0	0.0	0.0	0.3	0.0	1.4	1.7	0.93
West Hoffeldt Lane							
MP 0.0 to MP 1.0	0.0	0.0	0.0	0.0	0.3	0.3	0.29
Pelican Bay Road							
MP 0.0 to MP 1.0	0.0	0.3	0.0	0.0	0.0	0.3	4.11
Pedrioli Drive							
MP 0.0 to MP 1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
Oceanview Drive							
MP 0.0 to MP 4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
Rainbow Rock Road							
MP 0.0 to MP 1.0	0.0	0.0	0.0	0.0	1.0	1.0	1.37

Source: Oregon Department of Transportation. Includes only reported accidents.

[1] acc/yr = accidents per year

[2] acc/mvmt = accidents per million vehicle miles of travel

TABLE 4-13
INTERSECTION ACCIDENT SUMMARY (JANUARY 1994 - DECEMBER 1996)

	Average Accidents per Year by Type					Total (acc/yr) [1]
	Turn	Angle	Rear End	Pedestrian	Other	
Signalized Intersection						
US 101/Center St	0.7	0.3	0.0	0.0	0.0	1.0
US 101/Oak St	1.3	0.4	1.0	0.0	0.3	3.0
Unsignalized Intersection						
Azalea Park Rd/Fir St	0.0	0.0	0.0	0.0	0.0	0.0
Center St/Railroad St	0.3	0.0	0.0	0.0	0.0	0.3
Easy St/US 101	0.3	0.0	0.0	0.0	0.0	0.3
Constitution Way/Old County Rd	0.0	0.0	0.0	0.0	0.0	0.0
Del Norte Ln/Old Country Rd	0.0	0.0	0.0	0.0	0.0	0.0
Easy St/Pioneer Rd	0.3	0.0	0.0	0.0	0.0	0.3
Easy St/Richards St	0.0	0.0	0.0	0.0	0.0	0.0
Elk Dr/Ross Rd	1.3	0.0	0.0	0.0	0.0	1.3
Elk Dr/5th St	0.0	0.0	0.0	0.0	0.0	0.0
Hemlock St/Willow St	0.0	0.0	0.0	0.0	0.0	0.0
Mill Rd/Railroad St	0.0	0.0	0.0	0.0	0.0	0.0
Oak St/Redwood St	0.0	0.0	0.3	0.0	0.0	0.3
Oak St/Spruce St	0.0	0.0	0.0	0.0	0.0	0.0
Old County Rd/Marina Height Rd	0.0	0.0	0.0	0.0	0.0	0.0
Old County Rd/Pacific Ave	0.3	0.0	0.0	0.0	0.0	0.3
US 101/Mill Beach Rd	0.0	0.0	0.7	0.0	0.0	0.7
US 101/Frontage Rd	0.3	0.0	0.0	0.0	0.0	0.3
US 101/Ross Rd	0.0	0.0	0.0	0.0	0.0	0.0
US 101/Pacific Ave	0.3	0.0	0.0	0.0	0.0	0.3
US 101/Mill Rd	0.0	0.0	0.7	0.0	0.0	0.7
US 101/Wharf St	0.0	0.0	0.0	0.0	0.3	0.3
US 101/Fern Ave	0.4	0.0	1.0	0.0	0.3	1.7
US 101/Willow St	0.0	0.0	1.0	0.0	0.3	0.3
US 101/Alder St	0.0	0.0	1.3	0.0	0.7	2.0
US 101/Constitution Wy	0.0	0.0	0.0	0.0	0.3	0.3

Source: Oregon Department of Transportation. Includes only reported accidents.

[1] acc/yr = accidents per year

The US 101 roadway segment between Arnold Lane and the Chetco River Bridge experienced an accident rate of 3.08 accidents/MVMT between 1994 and 1996. Approximately 60 percent of these mid-block accidents actually occurred at intersections. Adjusting the mid-block rate based on the number of

accidents occurring at intersections within the mid-block reduces the accident rate to 1.22 accidents/MVMT which is below the average statewide rate of 1.76 accidents/MVMT for non-freeway state facilities.

Typically, accident experience at intersections is measured in terms of accidents/million vehicles entering the intersection. However, as intersection level traffic volume data was available at only a limited number of intersections in the study area, average accidents per year was used as a surrogate for identifying locations with a greater than average accident experience. As shown in Table 4-12, the accident experience at study area intersections ranges between 0.0 to 3.0 accidents per year. Only the US 101/Oak Street intersection averaged above 2.0 accidents per year, with an accident rate of 2.7 accidents per year.

The accidents occurring at the US 101/Oak Street intersection were predominantly either turning or rear end accidents. Although this intersection represents the highest accident location, even this rate is typically considered within an acceptable threshold.

OPERATING DEFICIENCIES

The following operating deficiencies were identified within the local roadway system. None are sufficient to warrant immediate remedy.

- The excessive number of driveways with access to US 101 affects the capacity of the roadway as traffic pulling out of or into the driveways reduces vehicle speeds. Also, close driveway spacing can lead to increases in conflicts between vehicles turning into and out of driveways.
- The eastbound approach of the unsignalized intersection at US 101 (Chetco Avenue)/Pacific Avenue currently does not fall below acceptable V/C standards, but does operate at LOS E in the PM peak hour, indicating some delay experienced by drivers due to the eastbound approach traffic volumes conflicting with heavy traffic volumes on US 101.
- The westbound approach of the unsignalized intersection at US 101 (Chetco Avenue)/Fern Avenue does not fall below acceptable V/C standards, but also is currently operating at LOS E in the PM peak hour. Again, this indicates some delay due to the westbound approach of traffic volumes conflicting with heavy traffic volumes on US 101.
- The intersection of US 101 and Constitution Ave. is currently unsignalized and the left turn from Constitution operates below acceptable V/C standards. A signal may be warranted at this location in the future, although the proximity of the weigh station to the intersection will make signalization difficult.

CHAPTER 5: 2017 BASELINE TRAFFIC CONDITIONS

The 2017 traffic projections developed as part of this study are used as the basis for assessing future roadway conditions and likely improvement requirements. These projections have been developed using a simplified travel demand model, which relies on a combination of land use-driven trip generation and distribution, and on a trend analysis, which uses historical experience and anticipated land use development as a basis (including several large future development projects anticipated within the study area).

Twenty-year projections were developed when this study commenced in 1997. Development of the TSP occurred between 1998 and 2000 and adoption is expected to occur in 2001, at which point the forecasts only extend 16 years into the future. Concern was raised that, by the time the plan is adopted, the plan would not truly be a 20-year plan. However, while 20-year time frame is preferred, the TPR allows for planning horizons as short as 15 years. Further, the travel forecasts were not the driving force behind the transportation projects the community wished to pursue. The projects evaluated in the improvement options analysis, and those projects ultimately recommended in the modal plans predominantly address safety, pedestrian and bicycle facilities, access management, emergency routes, and connectivity, rather than capacity issues because in most cases the existing transportation infrastructure could meet the forecast demand. Therefore, the plan serves the intended purpose, and the 15-year forecast does not detract from the plan. Furthermore, it is expected that the TSP will go through periodic review every 8-10 years at which time the travel forecasts will be updated.

In general, an understanding of the underlying land development and demographic growth anticipated within the study area is important to provide a good foundation for understanding future travel demand and the need for improvement projects. The following discussion is intended to provide a general sketch of the assumptions and analysis methodology inherent in developing the year 2017 traffic projections. Included is a description of the population and land use forecasts that form the basis for the traffic projections, as well as a discussion of the travel demand forecasting process and resulting projections.

POPULATION AND LAND USE FORECASTS

The Brookings-Harbor area has been one of the fastest growing areas in Oregon during the past decade. The population increase is mostly a result of in-migration from persons of retirement age, rather than natural increase. To accommodate the rapid increase in population, a substantial increase in land devoted to urban uses will likely be necessary along with an increase in the existing housing stock. Along with the rise in population will come increases in the demand for commercial, industrial and institutional land uses.

The purpose of this sub-section is to identify expected future growth within the Brookings study area including not only the magnitude of that growth but also the spatial distribution of future residential, commercial and industrial land uses. These future land use projections will form the basis of the development of future traffic projections, the analysis of future transportation system deficiencies, and, ultimately, the development of a transportation improvement program.

The beginning of this sub-section presents a thorough explanation of the demographic changes that the Brookings-Harbor area has experienced over the last 20 years, as well as the anticipated growth in population through 2017. The population forecasts were used as a basis for determining future housing demand. In the course of this analysis, it appears that a major constraint in meeting future housing demands is the supply of buildable residential land within the existing Urban Growth Boundary (UGB). The City of Brookings is currently negotiating an expansion in this boundary with the Oregon Department of Land Conservation and Development (DLCD). Technical analyses used as a basis for

identifying the need for and extent of a UGB expansion have been used as the basis for the analysis contained in this section and the development of future traffic volume forecasts. These reports include:

- Curry County Population Discussion, David Evans and Associates, Inc., December 3, 1997.
- Technical Memorandum: Brookings Urban Growth Boundary Needs Analysis, Linda Davis for Cogan-Owens-Cogan, March 6, 1995; and
- Brookings Urban Growth Boundary Exception and Urban Reserve Establishment Study, David Evans and Associates, Inc., July 12, 1993.

Should it be approved by DLCD, the proposed expansion to the UGB would allow the City to provide services and buildable land outside of the current UGB boundaries.

The following paragraphs will consider: 1) historic and projected population growth; 2) future housing needs based on a broad geographic distribution of population growth; and 3) future land use projections for residential, commercial and industrial land uses by general location.

Population Growth and Distribution

Information used in this analysis was from the U.S. Census Bureau and Portland State University's Center for Population Research and Census. The U.S. Census data does not reflect demographic characteristics consistent with the Urban Growth Boundaries (UGB) of Oregon communities, but includes city limits, counties and various tracts or districts within Counties. The U.S. Census Bureau recognizes two separate geographical entities in the Brookings-Harbor area; the incorporated City of Brookings and the Harbor Census Designated Place (CDP). The Census Bureau has kept track of growth for these areas over the years to provide a historic base of information for the region.

For this report, data will address the City of Brookings, the 1980 Harbor CDP, Curry County, and aggregated areas north and south of the Chetco River within the existing and proposed UGB. Forecasts contained in this report are based on current population located within the study area and historic growth trends of the study area.

Historic Population Growth

Population growth in the Brookings-Harbor area has been erratic over the past two decades, growing dramatically in some years, while decreasing in others. A linear graph of historic growth would display a series of peaks and valleys exhibiting the erratic growth experienced by the area. A line drawn between the peaks and valleys would project average growth long term, and would illustrate how population in the area has increased steadily at approximately 2.4 percent per annum for the Brookings city limits and 1.9 percent for the Harbor CDP. The long-term growth rate is critical for establishing a basis to project future growth.

Table 5-1 summarizes population growth between 1970 and 1990 for the study area and Curry County as a whole. From 1970 through 1980, the City of Brookings' population increased from 2,720 to 3,384 at an annual growth rate of 2.21 percent. Curry County grew from 13,006 to 16,992 during that same period at a growth rate of 2.71 percent annually.

TABLE 5-1
BROOKINGS-HARBOR URBAN GROWTH STUDY AREA HISTORIC POPULATION GROWTH TRENDS

	1970	1980	1970-1980 % Change	1990	1980-1990 % Change	Annual Growth Rate 1970-1990
City of Brookings	2,720	3,384	24.41%	4,400	31.21%	2.4%
Harbor CDP				2,143		
Curry County	13,006	16,992	30.65%	19,327	13.74%	1.9%

Source: Brookings Urban Growth Boundary Exception and Urban Reserve Establishment Study, David Evans and Associates, July 12, 1993

Population in the City of Brookings increased from 3,384 to 4,400 during the 1980-1990 period, while Curry County increased from 16,992 to 19,327. Annual average population growth over the 20 year time period from 1970 to 1990 in Brookings was 2.4 percent. The 20-year annualized growth for Curry County was 1.9 percent. The Harbor CDP had not been formed by the Census Bureau until the 1980 Census, and had a significant boundary modification in 1990. Therefore, only data for 1990 is shown for the Harbor CDP, when the population was 2,143.

For the past five years, Curry County and the City of Brookings have led Oregon in population growth rates. Since 1987, Curry County has grown at approximately 4.5 percent per year, while the City of Brookings has grown at 6.3 percent per year, faster than any other coastal city.

Most of this population growth has been the result of in-migration, rather than natural increase. In 1990, approximately 23 percent of Brookings' population exceeded the age of 65, almost 6 percent more than in 1980. Curry County as a whole has also experienced this same in-migration with an increase in senior population of about 12 percent since 1980. The percentage of Brookings residents 55 or older is 50 percent higher than that of the state; for Curry County, it is about 70 percent greater. The data suggests that much of the population growth in the area is a result of in-migration of retirees. Table 5-2 shows the population for Brookings and Curry County by age.

TABLE 5-2
POPULATION BY AGE, 1990

	City of Brookings		Curry County		Oregon	
Age	Number	Percent	Number	Percent	Number	Percent
Under 5	315	7.2	1,084	5.6	201,421	7.1
5-14	632	14.4	2,310	12.0	411,140	14.5
15-24	417	9.5	1,610	8.3	379,097	13.3
25-34	605	13.8	2,211	11.4	451,544	15.9
35-44	622	14.1	2,705	14.0	474,851	16.7
45-54	379	8.6	2,093	10.8	296,595	10.4
55-64	459	10.4	2,600	13.5	236,349	8.3
65+	971	22.1	4,723	24.4	391,324	13.8
Total	4,400	100	19,327	100	2,842,321	100

Source: U.S. Census, 1990

Population Projections

Table 5-3 presents the most recent forecasts of future population growth for the Brookings-Harbor Urban Growth Study Area. The 1993 population for the Brookings-Harbor area was 8,749. This estimate formed the basis for projections of future population growth in the study area, which are documented in the reports prepared for the City and previously identified in the Introduction. These reports were prepared to validate the need for an expansion of the existing Urban Growth Boundary. The population forecasts identified in these reports will form the basis for future travel demand projections, and the development and analysis of transportation system needs.

TABLE 5-3
BROOKINGS-HARBOR URBAN GROWTH STUDY AREA POPULATION FORECASTS

	1993	2015	2017
North of Chetco River	5,821	10,938	11,380
South of Chetco River	2,928	5,502	5,724
Total	8,749	16,440	17,104

Source: Curry County Population Discussion, David Evans and Associates, December 3, 1997.

1993 data from Technical Memorandum: Brookings Urban Growth Boundary Needs Analysis, Linda Davis for Cogan-Owens-Cogan, March 6, 1995, adjusted by 2.96 percent per year.

As illustrated in Table 5-3, population is estimated to grow to 17,104 in 2017. This equates to an annual average growth rate of 2.83 percent.

Potential Development Impact Analysis

To supplement the demographic analysis and to determine more specific potential growth areas in Curry County, DEA reviewed ODOT's Potential Development Impact Analysis (PDIA). The PDIA, issued in March 1996, provides estimates for a maximum development scenario in rural Curry County. At the time the analysis was completed, the expansion of the Brookings Urban Growth Boundary had not received final approval and, therefore, the analysis does not reflect that change. A detailed summary of the PDIA is contained in Appendix C.

The analysis is based on a number of assumptions, some of which are acknowledged to overstate potential development. Some of the key assumptions include the following:

- No adjustments were made for slopes, bodies of water, riparian areas, or other physical development constraints.
- Development estimates do not account for market factors.
- Where the zoning ordinance does not specify a parking requirement, no adjustment was made for parking.

The analysis concludes that there is potential for development of all land use designations in rural Curry County as shown in the table below.

TABLE 5-4
POTENTIAL DEVELOPMENT IMPACT ANALYSIS SUMMARY

	Acreage		Residential Units		
Designated Use	Net Area	Vacant	Existing	Potential	Maximum
Residential	9,016	1,707	4,038	443	4,442
Commercial	927	586	N.A.	9,790.8[1]	N.A.
Industrial	218	120	N.A.	N.A.	N.A.

[1] Commercial potential shown as 1,000 square feet of potential development.

Approximately 9,016 acres of land are zoned for residential uses with 4,038 existing residential units. Of the residential land, approximately 1,707 acres are vacant representing development potential of 443 units. This methodology combines existing units with the potential units to achieve a maximum development potential. This maximum is estimated at 4,442 residential units.

Non-residential uses also have significant development potential. Approximately 927 acres of land are zoned for commercial uses. Of this land, an estimated 586 acres are vacant, yielding 9,790,739 square feet of potential development. Approximately 218 acres of land are zoned for industrial uses. Of this land, an estimated 120 acres are vacant. The PDIA analysis does not provide an estimate of the potential development represented by these 120 acres.

Housing Growth

Historic Housing Supply

Table 5-5 presents a summary of 1990 U.S. Census data which identifies the total housing units by type for Brookings, the Harbor area and Curry County. According to the 1990 census, the City of Brookings and the Harbor area have very different residential mixes. One obvious difference is the higher number of mobile homes in the Harbor Area compared to the City of Brookings, which has a much higher proportion of multiple family residences.

TABLE 5-5
TOTAL HOUSING UNITS BY TYPE, 1990

	City of Brookings		Harbor Area		Curry County	
Housing Type	Number	Average Value[1]	Number	Average Value[1]	Number	Average Value[1]
Single Family	1,388	$110,785	397	NA	5,386	$114,899
Detached	1,267	$110,498	389	NA	5,194	$114,911
Attached	121	$120,093	8	NA	192	$114,180
Multi-Family	570	$145,531	35	NA	1,014	$138,885
Duplex	231	$114,531	10	NA	343	$127,031
3+ units	339	$119,444	25	NA	671	$147,917
Mobile Home	85	$79,952	848	NA	3,324	$46,488
Other	46	$164,773	12	NA	161	$124,041
Total 1990	2,089	$110,326	1,292	$114,200	9,885	$89,338
Total 1980	1,404	NA	1,295	NA	NA	NA
% Change 1980-90	47%	NA	0%	NA	NA	NA
Annualized Growth 1980-90	4.1%	NA	0%	NA	NA	NA

Source: 1990 U.S. Census as cited in Forecast of the Long-Run Demand for Housing in the Brookings-Harbor Area, ECO Northwest, March, 1993

(1) Owner Occupied Units

(2) The increase in housing units for the Harbor area is likely understated because of differences in defining the boundaries on the Harbor area in the 1980 and 1990 Census.

In 1990, Brookings had about 2,100 housing units, of which approximately 1,400 were single-family. A comparison of the 1980 and 1990 Census data shows that Brookings has experienced a significant amount of growth in both single-family (+400 units) and multi-family units (+225 units) since 1978. In 1990, the Harbor area had about 1,300 housing units, of which approximately 400 were single-family units. There has been little change in the total number of housing units in the Harbor area between 1980 and 1990, but there has been a change in housing mix to more mobile homes and manufactured homes.

Future Housing Needs

For purposes of assessing the need for future housing, the existing Urban Growth Boundary has been divided into two major subareas, north and south of the Chetco River. The separation between the two areas reflects varying topographic, political, and public service constraints in both portions of the UGB.

The area north of the Chetco is composed of the City of Brookings and unincorporated lands north and east of the city. The proposed and existing areas of the UGB are not as steep in topography as some of the areas south of the Chetco. The City of Brookings is the only provider of public sewer and water services north of the Chetco at this time.

The area south of the Chetco River is composed of the unincorporated community of Harbor and other unincorporated lands south and east of Harbor. The areas within the proposed UGB contain developed

lands within a flat area extending south to California, and steep topography in the Harbor Hills. The Harbor Sanitary District and Harbor Water Public Utility District are major service providers in this subarea.

Given the demographic changes that have been occurring, and the relative attractiveness and economic value of the Oregon Coast, the demand for housing from people is projected to continue. Table 5-6 summarizes the population forecasts and estimates of future housing needs to the year 2017 for the areas both north and south of the Chetco River. The number of new dwelling units needed by 2017 is calculated by taking the total projected population and dividing by the average household size, 2.13 for the area north of the Chetco River, and 1.65 for the area south of the Chetco River[1]

TABLE 5-6
PROJECTION OF 2017 HOUSING NEED

	1993	2015	2017
North of Chetco	2,733	5,135	5,343
South of Chetco	1,775	3,335	3,469
TOTAL	4,508	8,470	8,812
Existing Dwelling Units		4,508	4,508
New Dwelling Units Needed		3,962	4,304

Source: Technical Memorandum: Brookings Urban Growth Boundary Needs Analysis, Linda Davis for Cogan-Owens-Cogan, March 6, 1995.

By the year 2017, the population north of the Chetco River is projected to be 11,380, and the population south of the Chetco is projected to be 5,724. The estimated amount of new housing units needed for both areas north and south of the Chetco by the year 2017 is 4,304.

Future Land Use Projections

As indicated earlier in this report, population growth and business development activities in the Brookings-Harbor study area will fuel future demands for increased urbanization. This includes land devoted to housing, as well as commercial and industrial uses. This section will discuss the need for additional residential, commercial and industrial acres of development through the planning period to 2017 based on the earlier assessment of likely population growth. It will further present an allocation of this development to specific geographic sub-areas within the larger study area. This geographic allocation (including number of dwelling units, as well as gross square footage of commercial and industrial development) will then form the basis for preparing travel demand projections.

1 Source: "Technical Memorandum: Brookings Urban Growth Boundary Needs Analysis," Linda Davis for Cogan-Owens-Cogan, March 6, 1995.

Future Residential Land Needs

Residential land needs through 2017 will be a function of the expected mix of housing (i.e., single versus multiple-family dwelling units) and the density of that development. Neither the City of Brookings nor Curry County have conducted a study on future housing needs for the study area. Therefore, the analysis herein will rely on a scenario used in the previously cited report Technical Memorandum: Brookings Urban Growth Boundary Needs Analysis, Linda Davis for Cogan-Owens-Cogan, March 6, 1995, to determine future residential land needs based on the following housing mix:

- 52 percent traditional single family, including manufactured homes located on single family lots. This is lower than the present City of Brookings, but higher than the Harbor CDP.
- 24 percent multiple family (two or more attached units per building). This is lower than the present City of Brookings, but much higher than the Harbor CDP.
- 24 percent mobile homes – both traditional mobile homes and manufactured homes located within parks. This is much higher than the City of Brookings but considerably lower than the Harbor CDP.

This scenario is based on the assumptions that: 1) the proportion of mobile homes will decrease, and be replaced with manufactured homes in parks and single family lots; 2) most of the new home construction will consist of custom single family homes compatible with topographic constraints; and 3) a higher demand for multiple family homes as an affordable housing option, as a result of the increase in single family housing costs. Table 5-7 summarizes the foregoing assumptions and provides an allocation to the geographic areas north and south of the Chetco River. It is important to note that changes the assumed mix of residential land uses would alter the estimate of future acreage needed for residential development.

TABLE 5-7
RESIDENTIAL LAND NEEDS BY HOUSING TYPE 2017

2017 Projected Housing Ratios	1990 Census	2017 Projection	New Units	% North	% South
Single Family	45%	52%	2,582.4	75%	25%
Multiple Family	14%	24%	1,506.4	85%	15%
Mobile Homes	41%	24%	215.2	15%	85%
Total	100%	100%	4,304.0		

Source:Technical Memorandum: Brookings Urban Growth Boundary Needs Analysis, Linda Davis for Cogan-Owens-

Table 5-8 highlights the conversion of projected future demand for residential dwelling units by type to acreage by three categories of development density. This summary also includes land requirements for urban infrastructure (i.e., non- residential uses, streets and other rights-of-way typically located in most residential areas). Acreage estimates are subdivided into the geographic areas north and south of the Chetco River.

TABLE 5-8
PROJECTED NEED FOR RESIDENTIAL ACREAGE BY HOUSING DENSITY, 2017

Category	Total	North	South
Single Family (4 dwelling units/acre)	645	484	161
Multiple Family (15 dwelling units /acre)	100	785	15
Mobile Homes (6 dwelling units /acre)	36	5	31
Sub Total	781	574	207
Additional for Streets, Easements, etc. (25%)	195	143	52
Net Residential Need	976	717	259

Source: Abstracted from Technical Memorandum: Brookings Urban Growth Boundary Needs Analysis, Linda Davis for Cogan-Owens-Cogan, March 6, 1995.

According to the information summarized in Table 5-8, the projected residential vacant land need for 2017 is 976 acres, which is 383 acres more than what currently is available in the existing UGB. Based on the assumptions previously discussed, the need for more land is almost equal for both areas north and south of the Chetco River. For purposes of the transportation analysis, it will be assumed that additional residential acreage will be available at locations currently outside of the existing UGB but within the proposed UGB extension.

Future Commercial and Industrial Land Needs

The David Evans report[2] projected industrial and commercial land needs to the year 2013. These projections are presented in Table 5-9. These estimated land needs were adjusted by Linda Davis in her report[3] to reflect the spatial requirements of streets, easements and other non-commercial, non-industrial land uses typically found in these areas. Land needs have also been increased slightly to account for growth in demand in commercial and industrial land uses between 2013 and 2017.

2 "Brookings Urban Growth Boundary Exception and Urban Reserve Establishment Study", David Evans and Associates, July 12, 1993.

3 "Technical Memorandum: Brookings Urban Growth Boundary Needs Analysis", Linda Davis for Cogan-Owens-Cogan, March 6, 1995.

TABLE 5-9
COMMERCIAL AND INDUSTRIAL LAND NEEDS

Category	Commercial	Industrial	Total	North	South
Commercial/Industrial	305	180	485	291	194
Additional for Streets, etc. (20%)	61	36	97	58	39
Additional Demand 2017	74	44	118	71	47
Total vacant land need	440	260	700	420	280
Existing vacant land in UGB	68	106	174	104	70
Add'l vacant land need 2017	372	154	526	316	210

Source: Abstracted from Technical Memorandum Brookings Urban Growth Boundary Needs Analysis, Linda Davis for Cogan-Owens-Cogan, March 6,1995.

Based on these projections, a total of 700 acres of commercial and industrial land is needed to accommodate development expectations by the year 2017. As with residential land needs, not all of this future demand can be accommodated within the existing Urban Growth Boundary. For purposes of this report, it has been assumed that a total of 174 acres can be accommodated within the existing UGB and that the additional demand (526 acres) will be accommodated within the proposed UGB expansion.

Summary of Future Land Needs

When the residential and commercial/industrial acreage requirements identified in Tables 5-8 and 5-9 are combined, there would be a total need for additional urban land of 1,676 acres by 2017. After subtracting acres of unbuildable land (i.e.) steep slopes exceeding 30 percent), a net of 640 acres of suitable land is available within the Urban Growth Boundary to meet this need. The proposed expansion to the Urban Growth Boundary would add 2,544 acres of vacant land of which total buildable acreage is estimated to be 1,150 acres. This would equate to a total of 1,790 acres suitable for urban development within the study area.

Table 5-10 illustrates a comparison between vacant land needs by general land use type and the land use supply within the existing UGB and proposed UGB expansion.

TABLE 5-10
VACANT DEVELOPABLE LAND TO MEET FUTURE LAND DEVELOPMENT NEEDS

Land Use	Land Needed by 2017	Vacant Developable Land (Acres)		
		Existing UGB	Proposed Addition to UGB	Total
Residential				
North of Chetco River	717	511	206	717
South of Chetco River	259	82	177	259
Total Residential	976	593	383	976
Commercial/Industrial				
North of Chetco River	420	144	276	420
South of Chetco River	280	30	250	280
Total Commercial	700	174	526	700
Total Need	1,676	767	909	1,676

A significant obstacle for land development within the current UGB in Brookings is the limited amount of large vacant parcels. According to a 1993 inventory, in the City of Brookings, there were 356 vacant residential lots that were dispersed throughout city. Of those lots, only five tracts were larger than ten acres. The remaining majority of undeveloped lots were less than one acre.

In the unincorporated area within the UGB, there exists a similar scattering of vacant residential land. According to the Linda Davis report, only 35 residential parcels remain. Ten are less than one acre in size, sixteen range from one to five acres, six range between five and 20 acres, and only three are larger than 20 acres. The limited amount of large, buildable parcels of land restricts the development potential of the market.

This short supply of buildable parcels also has an affect on commercial and industrial land. The 1993 inventory conducted by the City indicates that only nine commercial parcels ranging from one to nine acres currently exist. Only one industrial parcel of 3.9 acres exists that is suitable for development. This shortage of buildable commercial and industrial parcels could significantly hinder a region that is growing at such a rapid pace. As a result, it is expected that much of the new residential, commercial and industrial development within the study area will take place outside of the existing Urban Growth Boundary in the area proposed for a boundary expansion.

Future Land Use Growth And Distribution

In order to prepare estimates of traffic volumes attributable to new and/or modified land development within the study area (which then form the basis for roadway improvement recommendations), it is necessary to estimate the geographical distribution and magnitude of that development. Table 5-11 presents a summary of the assumed pattern of land development proposed to be used in the transportation study.

This summary is based on several sources of information and the following assumptions:

- Existing vacant buildable land currently within the Urban Growth Boundary will be fully developed for the designated use (i.e. residential, commercial or industrial).

- Development outside of the existing UGB but within the proposed expansion will occur within areas designated as Rural Exception Areas or Master Plan Areas.
  - Within the Rural Exception Areas, current parcelization reviewed in terms of parcel size, location and proximity to other undeveloped parcels. Based on this review, it has been assumed that each available parcel will be developed to accommodate a single dwelling unit.
  - Within the Master Plan Areas, existing available information with respect to developer expectations was used as the basis for estimating the number of dwelling units and future commercial square footage which would be developed.
- Minimum density assumptions are identified in Table 5-11.

TABLE 5-11

BROOKINGS-HARBOR STUDY AREA ZONAL ALLOCATION OF FUTURE LAND DEVELOPMENT, 2017

Name	Land Use	Total Acres	Total Parcels	Developed Parcels	Vacant Parcels	Vacant Acres	Dwelling Units/Acre	Dwelling Units	Comm. & Indust. Acres
Lone Ranch Creek Master Plan Area	Residential, commercial, 18-hole golf course, 200-room hotel	664	--	--	--	--	--	800	75
			–	–	–	–	–	100	
Rainbow Rock Rural Exc. Area	Small rural residential lots, commercial/ industrial	206	79	63	17	--	--	40	--
Shady Cove Rural Exc. Area	Rural resid.(1-6 ac.)	56	24	13	11	--	--	36	--
Pleasant Hills/ Tiderock Rural Exc. Area	#48 - Rural residential (1-14 acres), commercial, public boat ramp	130	46	32	14	--	--	43	--
	#49 - Rural residential (1-20 acres), commercial, RV park, industrial	330	112	66	46	--	--	107	--
Jacks Creek Master Plan Area	Rural residential (<1-4 acres)	66	20	16	4	--	--	4	--
	Exclusive Farm Use, Golf Course	182				182	--	--	--
Harbor Hills Master Plan Area	Vacant resource land, PUD if included in UGB	110	--	--	--	110	--	528	--
North Harbor Area	Single Family (100%)	1213	--	--	--	1124.4	--	1275	--
			--	--	--	48.4	--	–	--
	Multi-family		--	--	--	40.2	--	714	40.2
	Commercial								
Pedrioli/Camelli a Park Rural Exc. Area	Rural residential, rural comm (1-10 ac.)	168	146	114	32	--	--	60	--
Itzen	Residential, Retail	23	--	--	--	23	--	100	4
Oceanview Rural Exc. Area	Rural residential, rural commercial	110	120	93	27	--	--	57	--
Sub-total	UGB Expan. Area							3,764	113.5
Within City	Residential							498[1]	--
	Commercial							--	45
	Industrial							--	3.9
Within County (inside UGB)	Residential							42	--
Sub-Total	Existing UGB							540	48.9
TOTAL								4,304	162.4

Source: Curry County Planning Department, May 1995.

[1] Includes previously approved developments not yet built.

When compared with the earlier summaries of need for future residential, commercial and industrial development, the information contained in Table 5-11 indicates that this future need can be met for housing within the proposed Urban Growth Boundary expansion.

The commercial and industrial acreage identified in Table 5-11 falls far short of the projected need identified in Table 5-9 (162.4 acres allocated versus 640 acres needed). This additional acreage requirement needs to be discussed to determine: 1) the location and size of other commercial/industrial development which could occur; 2) a reduction in the assumption of future need; or 3) a combination of these two adjustments.

2017 Traffic Forecast

The 2017 future traffic volumes were forecasted by assuming the development of certain vacant land in the future, calculating the trip generation potential of that vacant land, developing a trip distribution pattern for the future trips, and assigning the future trips to the roadway network based on the trip distribution pattern.

There are four trip types to consider in the trip generation exercise:

- External to external trips – These trips are trips that originate outside the study and travel through the study area.
- External to internal trips – These trips are trips that are attracted to an origin within the study area from outside the study area.
- Internal to external trips – These trips originate within the study area and are destined somewhere outside the study area.
- Internal to internal trips – These trips originate from within the study area and are destined within the study area.

All of the trip types can be generated from the trip generation rates of assumed future land uses with the exception of the external to external trips. The external to external trips are not related to future land development. These trips only pass through the entire study area to a destination outside the study area.

The external to external trip component within a study area is typically determined by a license plate survey. Since a license plate survey was not part of the scope of this work, the external to external trip component cannot be developed directly. Historical daily traffic volume data was used to determine the external to external growth rate and the external to external trip component was developed from daily traffic trends on US 101. This historical traffic volume data is illustrated, by location, in Table 5-12.

Based on the growth rates shown in Table 5-12, the historical annual traffic growth rates on US 101 north and south of Pacific Avenue are 0 and 0.5 percent, respectively. Also, the historical increase in traffic volumes is low along this segment of US 101. Both the growth rates and actual increase in traffic volumes further north and south of Pacific Avenue are significantly higher. This trend of traffic growth along US 101 indicates that the increase in long trip travel in the study area is limited. Since all of the annual traffic growth rates include an external to external trip component and the change in number of external trips must be constant along the entire US 101 corridor, a conservative estimate of the increase in external to external trip travel would be the lowest increase in traffic growth along the US 101 corridor. The lowest increase in daily traffic along the US 101 corridor is zero just south of Pacific Avenue. Since it is unrealistic to expect zero percent increase in external to external trip travel, a nominal annual growth rate of 0.5 percent was used to estimate the future increase in external to external trip travel.

TABLE 5-12
HISTORICAL ANNUAL TRAFFIC GROWTH RATES ON US 101

Location	Milepost	1982 Daily Count	1993 Daily Count	Annual Growth Rate
Thomas Creek Bridge	347.78	N/A	3,700	-
North of Dawson Road	354.73	3,400	5,200	3.9%
North Brookings City Limits	355.38	5,200	7,700	3.6%
South of Ransom Avenue	356.12	7,900	10,000	2.2%
North of Arnold Lane	356.50	8,900	12,000	2.8%
North of Pacific Avenue	357.07	15,000	15,000	0.0%
South of Pacific Avenue	357.09	15,100	16,000	0.5%
South of Fern Avenue	357.34	13,000	16,000	1.9%
South of Alder Street	357.58	11,800	17,000	3.4%
Chetco River Bridge	357.98	13,600	18,000	2.6%
South of South Bank Chetco River Road	358.14	11,700	15,000	2.3%
North of Hoffeldt Lane	358.73	10,000	13,000	2.4%
South of Hoffeldt Lane	358.77	8,100	12,000	3.6%
South of Benham Lane	359.33	7,400	9,900	2.7%
South of Pedrioli Road	359.57	6,700	8,800	2.5%
Winchuck Automatic Recorder	362.00	4,900	7,700	4.2%
Winchuck River Bridge	362.61	4,500	7,300	4.5%
Oregon-California State Line	363.11	4,700	7,000	3.7%
Weighted Average Annual Historical Growth Rate				2.4%

Source: ODOT, 1982 and 1993 Traffic Volume Summaries

Since a license plate survey was not conducted to determine the number of external to external trips entering and exiting the study area, the existing traffic volume pattern along US 101 was used to estimate the existing external to external trips. As shown in Table 5-12, the daily traffic volumes just outside the study area at the Thomas Creek Bridge is 3,700. A portion of these trips are external to external trips. If all of these trips were external to external trips, the increase in daily external to external trips in 2017 would be approximately 470 assuming the 0.5 percent annual growth rate for external to external trips.

This translates to a worst case increase of external to external trips of 25 AM peak hour trips and 47 PM peak hour trips. Since even the worst case increase in external to external trips are nominal and would have a minimal effect on future traffic volumes, it was assumed that the external to external trips in 2017 would be accounted for from the build out land use assumptions.

The 2017 internal to external, external to internal, and internal to internal trips were estimated by assuming the vacant land build out previously identified in Table 5-11. Rates in the Trip Generation Manual, Institute of Transportation Engineers, 1990 were used in estimating the trip generation of the

future land development. Table 5-13 summarizes the trip generation rates used. Table 5-14 summarizes the vacant land trip generation assumed to be built out by 2017.

TABLE 5-13
TRIP GENERATION RATES USED IN 2017 TRAFFIC VOLUME FORECAST

	AM Peak Hour Trips			PM Peak Hour Trips			
Land Use	In	Out	Total	In	Out	Total	Daily
Single Family [1]	0.12	0.35	0.48	0.42	0.23	0.65	6.15
Apartment [1]	0.07	0.36	0.43	0.36	0.17	0.54	5.47
Condominium	0.07	0.37	0.44	0.36	0.19	0.55	5.86
Mobile Home Park	0.08	0.32	0.40	0.35	0.21	0.56	4.81
General Light Industrial	6.23	1.28	7.51	0.87	6.39	7.26	51.80
Industrial Park	8.27	1.82	10.09	2.20	8.28	10.48	62.90
Hotel	0.40	0.27	0.67	0.41	0.35	0.76	8.70
Golf Course	2.67	0.55	3.22	1.75	1.61	3.36	37.59
Retail - 40.2 ksf	1.34	1.34	2.68	5.01	5.01	10.01	110.20
Retail - 150 ksf	0.71	0.71	1.42	2.92	2.92	5.83	62.58

[1] ITE trip generation rates have been reduced to reflect the smaller than typical household size.

Note: KSF means thousand square feet of gross leasable space.

TABLE 5-14
TRIP GENERATION SUMMARY - BUILD OUT OF VACANT LAND THROUGH 2017

		AM Peak			PM Peak			
Area/Land Use	Density	In	Out	Total	In	Out	Total	Daily
Lone Ranch Creek								
Hotel - 85% occupancy	170 rms	54	37	91	56	47	103	1,183
Golf Course	18 holes	38	8	46	25	23	48	541
Retail	150 ksf	85	86	171	350	350	700	7,510
Single Family	800 du	77	224	301	269	147	416	3,936
Condominium	100 du	5	29	34	29	15	44	469
Total		259	384	643	729	582	1,311	13,639
Rainbow Rock								
Single Family	40 du	5	14	19	17	9	26	246
Shady Cove								
Single Family	36 du	4	13	17	15	8	23	220
Pleasant Hills/Tiderock								
Single Family	43 du	5	15	20	18	10	28	264
Mobile Home	107 du	9	34	43	37	22	59	515
Total		14	49	63	55	32	87	779
Jacks Creek								
Single Family	4 du	0	1	1	2	1	3	25
Golf Course	182 acres	48	10	58	31	29	60	680
Harbor Hills Master Plan Area								
Single Family	528 du	63	185	248	222	121	343	3,248
North Harbor Area								
Retail	40.2ksf	54	54	108	201	201	402	4,430
Single Family	1,275 du	153	446	599	536	293	829	7,841
Apartment	714 du	50	257	307	257	121	378	3,906
Pedrioli/Camellia Park								
Single Family	60 du	7	21	28	25	14	39	368
Itzen								
Mobile Home	100 du	8	32	40	35	21	56	481
Specialty Retail	43.56 ksf	26	17	43	49	64	113	1,772
Oceanview								
Single Family	57 du	7	20	27	24	13	37	352
Other Residential								
Within County in UGB	42 du	5	15	20	18	10	28	258
Within City	498 du	60	174	234	209	114	323	3,063
Railroad St. West of 5th								
General Light Industrial	20 acres	125	26	151	17	128	145	1,040
Railroad St - South of Wharf St								
Industrial Park	5 acres	41	9	50	11	41	52	310

The trips shown in Table 5-14 were assigned to the existing roadway network based on several trip distribution pattern. These trip distribution patterns were based on the following: commuting patterns

identified from a telephone survey conducted by the Gilmore Research Group; existing traffic patterns; and location of employment centers, residential areas, schools, and retail centers. The resulting 2017 AM peak hour traffic volumes are shown in Figures 5-1 and 5-2. The 2017 PM peak hour traffic volumes are shown in Figures 5-3 and 5-4. Figures 5-5 and 5-6 show the 2017 daily traffic volumes.

As shown in Figures 5-5 and 5-6, there are significant increases in daily traffic volumes along US 101. The most dramatic increases in traffic volumes occur along US 101 north of Carpenterville Road due to a potential destination resort by 2017. Traffic along US 101 from the destination resort to downtown Brookings increases from two to four times the existing traffic volumes. The daily traffic volumes on US 101 south of the Chetco River also is expected to have significant increases by the year 2017 due to development of Harbor Hills, North Harbor area, and Westbrook.

The Forest Service is currently planning an interpretive center, to be constructed some time between the years 2002 and 2005, through some old growth timber areas. The project would consist of elevated walkways though the old growth "canopies" and include visitor information. The exact location of this project is not known, but it would likely be accessed via South Bank Rogue River Road (near Gold Beach) or North Bank Chetco River Road (near Brookings), depending on the chosen location.

Preliminary estimates of attendance are 100,000 visitors per year. Assuming vehicle occupancy of 3 people per vehicle, this would equate to 33,000 vehicles per year, making a round trip from Highway 101, or 66,000 vehicle trips. Assuming the facility will be open approximately 330 days per year, the facility would add approximately 200 vehicle trips per day to the access road. With approximately 10 percent of daily trips occurring during the peak hour, 20 vehicle trips per hour would be added to the access road. This would have a negligible effect on the level of service on the two proposed roads, which are forecast to operate well below their capacity over the next 20 years. Because of the uncertainty of the location of the project, trips generated by the project were not added to the forecasts for the proposed access roads.

2017 Levels Of Service

Level of service analyses were conducted based on the 2017 traffic volumes shown in Figures 5-1, 5-2, 5-3, 5-4, 5-5 and 5-6. The results of the unsignalized intersection level of service analysis is summarized in Table 5-15. Table 5-16 summarizes the signalized intersection level of service analysis. Table 5-17 summarizes conditions at the US 101/Benham Lane intercession. The arterial and local street levels of service are summarized in Tables 5-18 and 5-19, respectively.

In all of the level of service tables, US 101 is considered to be oriented north-south throughout the entire study area although there are several sections oriented east-west. All other roadways are oriented based on these compass directions.

TABLE 5-15
2017 UNSIGNALIZED INTERSECTION LEVELS OF SERVICE

Unsignalized Intersection	AM Peak Hour LOS	AM Peak Hour Average Delay	AM Peak Hour V/C Ratio	PM Peak Hour LOS	PM Peak Hour Average Delay	PM Peak Hour V/C Ratio
US 101/Carpenterville Rd/Dawson Rd						
Northbound Left Turn	A	9.1	0.04	B	11.4	0.19
Southbound Left Turn	A	9.1	0.03	B	12.2	0.09
Eastbound Approach	D	33.3	0.49	F	>100.0	>1.2
Westbound Approach	F	>100.0	>1.2	F	>100.0	>1.2
US 101-Chetco Avenue/Arnold Lane						
Northbound Left Turn	B	10.1	0.02	B	12.8	0.08
Eastbound Approach	C	18.6	0.14	F	>100.0	1.07
US 101-Chetco Avenue/Mill Beach Road						
Northbound Left Turn	B	10.5	0.05	B	12.6	0.07
Eastbound Approach	D	26.8	0.12	F	67.7	0.62
US 101-Chetco Avenue/Pacific Avenue						
Northbound Left	B	11.0	0.10	C	16.6	0.16
Southbound Left	B	10.3	0.04	B	14.4	0.07
Eastbound Approach	F	>100.0	1.08	F	>100.0	>1.2
Westbound Approach	E	36.4	0.37	F	>100.0	> 1.2
US 101-Chetco Avenue/Fern Avenue						
Northbound Left	B	10.0	0.02	B	14.8	0.04
Southbound Left	B	10.8	0.04	C	15.7	0.13
Eastbound Approach	E	44.5	0.23	F	>100.0	>1.2
Westbound Approach	F	94.6	0.42	F	>100.0	>1.2
US 101-Chetco Avenue/Alder Street						
Northbound Left Turn	B	12.8	0.26	E	39.2	0.68
Eastbound Approach	E	43.3	0.63	F	>100.0	>1.2
US 101-Chetco Ave/Constitution Way						
Southbound Left Turn	B	14.9	0.22	C	22.9	0.38
Westbound Right Turn	C	17.1	0.19	C	22.7	0.25
Westbound Left Turn	F	>100.0	>1.2	F	>100.0	>1.2
Westbound Left Turn	F	>100.0	>1.2	F	>100.0	>1.2

TABLE 5-16
2017 SIGNALIZED INTERSECTION LEVELS OF SERVICE

Signalized Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Average Delay	V/C Ratio	LOS	Average Delay	V/C Ratio
US 101-Chetco Ave/5th St						
Northbound Left	D	40.8	0.57	E	70.4	0.83
Northbound Right/Through	B	18.8	0.55	E	69.2	1.06
Southbound Left	D	36.6	0.27	A	7.5	0.41
Southbound Right/Through	B	19.9	0.62	D	41.5	0.95
Eastbound Left	D	35.6	0.25	F	118.1	1.05
Eastbound Right/Through	D	39.2	0.51	F	108.7	1.08
Westbound Left	D	38.7	0.53	F	90.7	0.94
Westbound Right/Through	D	39.1	0.51	D	36.0	0.46
Overall	C	24.1	0.58	E	64.4	1.03
US 101-Chetco Ave/Center St						
Northbound Left/Through	A	3.7	0.43	A	9.1	0.71
Southbound Right/Through	A	3.4	0.39	A	8.2	0.67
Westbound Left/Right	C	24.9	0.17	D	37.9	0.47
Overall	A	3.9	0.39	A	9.8	0.66
US 101-Chetco Ave/Oak St						
Northbound Approach	D	37.7	0.97	C	31.4	0.93
Southbound Approach	C	31.1	0.91	F	81.3	1.11
Eastbound Approach	D	41.9	0.76	F	80.6	0.93
Westbound Approach	D	49.5	0.91	E	69.2	0.92
Overall	D	37.3	0.91	E	60.0	1.03
US 101/Shopping Center Ave						
Northbound Left	C	22.7	0.03	D	39.3	0.13
Northbound Right/Through	A	8.8	0.45	C	21.6	0.68
Southbound Left	C	22.7	0.03	D	38.9	0.06
Southbound Through	A	8.0	0.32	C	22.6	0.72
Southbound Right	A	6.6	0.02	B	16.1	0.25
Eastbound Left/Through	C	23.6	0.19	C	30.4	0.61
Eastbound Right	C	22.7	0.03	C	23.4	0.08
Westbound Left/Through	C	22.8	0.06	C	22.9	0.02
Westbound Right	C	22.7	0.03	C	22.9	0.02
Overall	A	9.2	0.34	C	22.7	0.61
US 101/Hoffeldt Lane						
Northbound Left	C	22.9	0.07	D	37.3	0.36
Northbound Right/Through	A	8.8	0.45	B	13.4	0.57
Southbound Left	C	22.7	0.03	D	35.7	0.15
Southbound Right/Through	A	8.0	0.32	B	14.3	0.63
Eastbound Approach	C	25.5	0.43	D	35.3	0.54
Westbound Approach	C	24.5	0.31	C	30.6	0.13
Overall	B	10.1	0.39	B	16.2	0.57

Benham Lane was not included in the original analysis, but was analyzed later for inclusion in the TSP. Traffic counts were taken in the summer of 2001 and used for the traffic analysis. Development is expected on both sides of US 101 near Benham Lane, including residential development to the east and commercial and residential development to the west. Details of this development were not available and could not be included in the TSP-level analysis. As a result, the future-year analysis provides only a rough estimate of performance.

The future analysis assumed that Benham Lane would be the primary access for these developments as no alternative, parallel roadway system was identified to serve them. Instead, the overall TSP land use assumptions and traffic growth rate (2.40 percent) used for the other intersection analyses was applied to growth at Benham Lane. Based on this estimate, Benham is expected to operate within V/C standards until full buildout of the UGB. However, more specific information regarding future developments is needed to provide a more complete estimate of future performance. This should also include any development being discussed by the Port of Brookings.

Regardless of the impacts of development on intersection capacity, concerns have been raised regarding its alignment and the potential for safety problems at this intersection. The intersection experienced seven accidents between 1998 and 2000, five of which were non-injury. The overall computed accident rate (accidents per million miles traveled) is not high for a Statewide Highway in an urban setting. Nonetheless, expected increases in traffic both from existing and future development may result in an increase in accidents. Traffic Impact Studies completed in conjunction with development in the area must address how trips will impact intersection safety as well as capacity.

Table 5-15 shows that all of the unsignalized intersections that were studied, with the exception of Mill Beach Road, have at least one leg projected to operate below acceptable V/C ratios (0.85) in 2017. In all cases, the highway approaches are expected to continue to operate within standards, but the local approaches will fall below acceptable limits. The movements at each intersection operating below 0.85 are described below:

- US 101-Carpenterville Road/Dawson Road – Both the east- and westbound approaches.
- US 101-Chetco Avenue/Arnold Lane - The eastbound approach.
- US 101-Chetco Avenue/Pacific Avenue – Both the east- and westbound approaches.
- US 101-Chetco Avenue/Fern Avenue - The eastbound and westbound approaches.
- US 101-Chetco Avenue/Alder Street - The eastbound approach.
- US 101-Chetco Avenue/Constitution Way - The Constitution Way westbound left turn movement.

The poor levels of service at the unsignalized intersections in Table 5-15 are caused by traffic volumes on US 101-Chetco Avenue conflicting with the minor street turning movement volumes. It is also expected that accesses to development in the UGB north of Carpenterville Road will operate below V/C standards in the future. Specific traffic studies will be needed to provide details regarding when and to what extent any capacity problems may occur.

As shown in Table 5-16, two signalized intersections in Brookings are expected to exceed the maximum OHP V/C ratio standard for US 101 (0.80). The overall intersection V/C ratio at US 101-Chetco Avenue/5th Street and at US 101-Chetco Avenue/Oak Street are projected to be in excess of 1.00. It is unclear what impacts development will have on the signalized intersection at US 101 and Benham Lane.

Tables 5-18 and 5-19 show that the following arterial, collector, and local street segments are projected to operate at unacceptable V/C ratios and below LOS D in the 2017 condition. The entire length of US

101 from north of Carpenterville Road to south of Hoeffeldt Road is expected to exceed the maximum 1999 OHP V/C ratio standards in the 2017 condition due to significant local reliance on the local highway. In addition, Pioneer Road north of Pacific Avenue and E. Benham Lane east of US 101 are expected to operate below the acceptable city standard of LOS D in the 2017 condition.

TABLE 5-18
2017 ARTERIAL/COLLECTOR ROADWAY LEVEL OF SERVICE SUMMARY

Roadway	Section	AADT	Capacity	LOS	V/C Ratio
US 101	N. of Carpenterville Rd	20,700	16,000	F	1.29
	North of Parkview Drive	23,800	16,000	F	1.49
	South of Ransom Avenue	26,000	16,000	F	1.63
	South of Easy Street	26,500	24,000	F	1.10
	North of Pacific Avenue	29,100	24,000	F	1.21
	South of Pacific Avenue	29,500	24,000	F	1.23
	North of Oak Street	31,300	24,000	F	1.30
	South of Alder Street	33,100	24,000	F	1.38
	Chetco River Bridge	33,800	37,000	E	0.91
	South of & Bank Chetco River Road	25,100	29,000	D	0.87
	North of Hoffeldt Lane	23,300	29,000	C	0.80
	South of Hoffeldt Lane	22,300	26,000	D	0.86
	North of Benham Lane	16,200	26,000	B	0.62
	North of Oceanview Drive	12,900	16,000	D	0.81
	Winchuck River Bridge	12,200	16,000	C	0.76
	North of OR-CA Border	11,900	16,000	C	0.74
Carpenterville Road	East of US 101	4,500	10,000	A	0.45
N. Bank Chetco River Rd	North of US 101	4,600	10,000	A	0.46
S. Bank Chetco River Rd	North of US 101	10,800	14,500	C	0.74
Easy Street	West of 5th Street	4,400	6,000	C	0.73
	East of 5th Street	4,000	6,000	B	0.67
	West of Pioneer Road	4,500	6,000	C	0.75
Lower Harbor Road	West of US 101	6,600	10,000	B	0.66
Benham Lane	West of US 101	4,200	6,000	B	0.70
Oceanview Drive	West of US 101	1,100	6,000	A	0.18
Winchuck River Road	East of US 101	2,800	10,000	A	0.28
Pacific Avenue	East of Fern Avenue	3,400	6,000	A	0.57
Old County Road	South of Marine	2,100	6,000	A	0.35
Constitution Way	North of US 101-Chetco Avenue	5,700	10,000	A	0.57
Railroad Street	North of Wharf Street	5,900	10,000	A	0.59
	South of Wharf Street	4,700	10,000	A	0.47
	North of Pacific Avenue	5,700	10,000	A	0.57
	South of Pacific Avenue	7,900	10,000	C	0.79
Pioneer Road	North of Pacific Avenue	5,800	6,000	E	0.97
Oak Street	South of Pacific Avenue	4,400	10,000	A	0.44
	North of US 101-Chetco Avenue	5,800	10,000	A	0.58
	South of US 101-Chetco Avenue	3,700	10,000	A	0.37

TABLE 5-19
2017 LOCAL STREET LEVEL OF SERVICE SUMMARY

Roadway	Section	AADT	Capacity	V/C Ratio	LOS
5th Street	North of Easy Street	2,500	6,000	0.42	A
	South of Easy Street	4,100	6,000	0.70	B
Alder Street	South of US 101-Chetco Avenue	4,500	6,000	0.72	C
Arnold Way	South of US 101-Chetco Avenue	1,600	6,000	0.27	A
Benham Lane	East of US 101	9,000	6,000	1.72	F
Dawson Road	West of US 101	1,900	5,000	0.38	A
Fern Avenue	North of US 101-Chetco Avenue	1,100	6,000	0.20	A
Hoffeldt Lane	East of US 101	1,800	6,000	0.30	A
	West of US 101	2,800	6,000	0.47	A
Mill Beach Road	West of US 101-Chetco Avenue	1,600	6,000	0.27	A
Pacific Avenue	East of Pioneer Road	2,700	6,000	0.45	A
	North of US 101-Chetco Avenue	1,500	6,000	0.15	A
Parkview Drive	East of US 101-Chetco Avenue	1,500	6,000	0.25	A
Pedrioli Drive	West of US 101	1,600	5,000	0.32	A
Pelican Bay Drive	East of US 101	200	500	0.40	A
Pioneer Road	South of Hasset Street	1,900	6,000	0.32	A
Ransom Avenue	East of US 101-Chetco Avenue	1,400	6,000	0.23	A
	West of Pioneer Road	1,300	6,000	0.22	A
Raymond Lane	East of US 101	200	500	0.40	A
Redwood Street	East of Fern Avenue	700	6,000	0.12	A
Wharf Street	South of US 101-Chetco Avenue	2,200	6,000	0.37	A

2017 DEFICIENCIES

Future Level of Service Standard

To define the future deficiencies of the study area transportation system, a level of service standard for roadway and intersection level of service must be adopted. The level of service standard defines the minimum acceptable facility performance and will be the threshold determining the need for improvements. If a roadway or intersection functions below the adopted standard, then improvements to mitigate the level of service to the standard or better need to be defined and implemented.

Different levels of service standards can be adopted for different types of local facilities. For example, a jurisdiction can set a different level of service standard for roadway sections, signalized intersections, and unsignalized intersections. Level of service for state facilities is established in the Oregon Highway Plan.

It may be desirable to set a lower level of service standard for unsignalized intersections since there are limited cost effective solutions for improving an unsignalized intersection short of signalization. Separate turn lane channelization at the side street approaches of an unsignalized intersections is one of the limited cost effective improvements that can be made; however, this improvement will not improve the side street left turn performance which is usually the problem at unsignalized intersections. Also, an

unsignalized intersection is unlikely to meet Manual of Uniform Traffic Control Devices (MUTCD) signal warrants unless the level of service is in the LOS E-F range.

The adopted level of service standard should reflect community values and views of acceptable delays and congestion levels. However, these values must be balanced by the community's ability to fund the needed improvements defined by the level of service standard. If the level of service standard is set too high, then it will be too costly to maintain the level of service standard. If the level of service standard is set too low, then substantial congestion problems result.

To define the future 2017 transportation deficiencies, LOS D was assumed to be the lowest acceptable level of service standard for all City of Brookings and Curry County transportation facilities. As stated above, performance on State roadways and intersections must be measured and evaluated using the volume to capacity ratio and not the associated LOS letter as established in the current version of the Oregon Highway Plan. Table 4-5 above summarizes those standards as applicable at the time of adoption of this TSP. Should those standards be amended subsequent to the adoption of this plan, the new or revised Highway Plan standards will be in effect.

If an intersection on the State system is operating below acceptable performance standards and a land use action is proposed which will cause the performance to worsen (i.e., V/C ratio increases), the action causing the worsening of conditions will be mitigated based on findings provided by the applicant and reviewed by ODOT. The applicant and ODOT will work through the local land use process to determine appropriate mitigation measures and cost sharing basis as needed.

2017 Transportation System Deficiencies

Local Roadway System

The following level of service deficiencies are projected to exist in 2017 on the roadway system within the study area:

- With the exception of US 101/Mill Beach Road, all of the unsignalized intersections that were analyzed have at least one approach that is projected to operate below acceptable V/C ratios in the 2017 condition. The poor level of service condition is caused primarily by the minor street traffic conflicting with heavy traffic volumes on US 101. Also, increased minor street volumes at the following unsignalized intersections also contribute to the poor level of service condition: US 101/Carpenterville Road/Dawson Road, US 101-Chetco Avenue/Pacific Avenue, US 101-Chetco Avenue/Alder Street.
- US 101 from north of Carpenterville Road to south of Alder Street is projected to operate below the acceptable V/C ratio of 0.85 in the 2017 condition. This condition will result from US 101 being the only arterial through the study area, serving both through and local traffic. The majority of traffic generated by new developments will use US 101 in the future for both longer regional trips and shorter local trips thereby further degrading performance on the highway.
- The LOS E condition on Pioneer Road north of Pacific Avenue would be caused primarily by infill single family development north of Ransom Avenue and additional future trips generated by the schools.
- East. Benham Lane east of US 101 is projected to operate at LOS F in the 2017 condition. This condition is primarily caused by the additional trips generated by developments in the Harbor Hills. E. Benham Lane is one of the logical access points to these future developments, although others may be constructed that might reduced capacity problems on Benham.

- Development proposed for both the east and west sides of US 101 near Benham Lane may cause the US 101/Benham Lane intersection to fall below acceptable capacity and safety performance standards. Additional study in conjunction with specific development is needed to determine the aggregate effects of area development on the intersection. Distribution of trips on a network of local streets may decrease the impacts to US 101/Benham Lane.

Figures 5-7 and 5-8 illustrate the 2017 future transportation deficiencies based on the 2017 traffic volume forecast and existing transportation system.

Non-Motorized Facilities

There is currently limited transit service in the study area. As the retirement population in the Brookings-Harbor area increases, additional transit service will be needed to serve the retirement community. Comments pertaining to bicycle and pedestrian facility deficiencies under existing conditions would also pertain to future conditions in the absence of improvements.

Sources

South Coast Transportation Study, Parametrix, Inc., May 1996.

Brookings Comprehensive Plan, September 1981.

Brookings Comprehensive Plan Inventory, September 1981.

CHAPTER 6: IMPROVEMENT OPTIONS ANALYSIS

As required by the Oregon Transportation Planning Rule, transportation alternatives were formulated and evaluated for the Brookings Transportation System Plan. These potential improvements were developed with the help of the TAC, and the individual communities and attempt to address the concerns specified in the goals and objectives (Chapter 2).

Each of the transportation system improvement options was developed to address specific deficiencies, land use issues, traffic operations, safety issues, or access concerns. The following list includes all of the potential transportation system improvements considered. Improvement Options 2 through 10 are illustrated in Figure 6-1.

The proposed transportation system improvement options include both state highway and local road projects. This section of the TSP describes the individual improvements and their associated costs. Improvement options include:

1. Revise Zoning and Development Codes to Encourage Proximity of Compatible Uses.
2. Improve the intersection of Constitution Way and US 101.
3. Improve US 101 between Carpenterville Road and Alder Ave.
4. Construct the US 101 couplet in the City of Brookings
5. Improve the intersection of US 101 and Benham Lane/Create Harbor Hills Connections
6. Improve the intersection of Benham Lane and Ocean View Drive in Harbor.
7. Improve Parkview Drive to the Brookings Airport.
8. Improve the unsignalized intersections which are projected to operate at sub-standard levels-of-service.
9. Improve the signalized intersections which are projected to operate at sub-standard levels-of-service.
10. Improve the arterial and collector street segments which are projected to operate at sub-standard levels-of-service.
11. Improve the intersection of Lower Harbor Road and Shopping Center Road at the entrance to the Port of Brookings.
12. Construct a third lane on US 101 south of Harbor.
13. Improved east-west connection between the South Coast and I-5.
14. Develop an alternative route to US 101 for when the highway is closed.
15. Implement transportation demand management strategies.

As discussed in the remaining sections of this chapter, not all of these considered improvements were recommended. The 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 potential improvements were analyzed to determine if they could reduce

LEGEND

- - - - - - - - CITY LIMITS
——————— ROADWAY IMPROVEMENTS
O INTERSECTION IMPROVEMENTS

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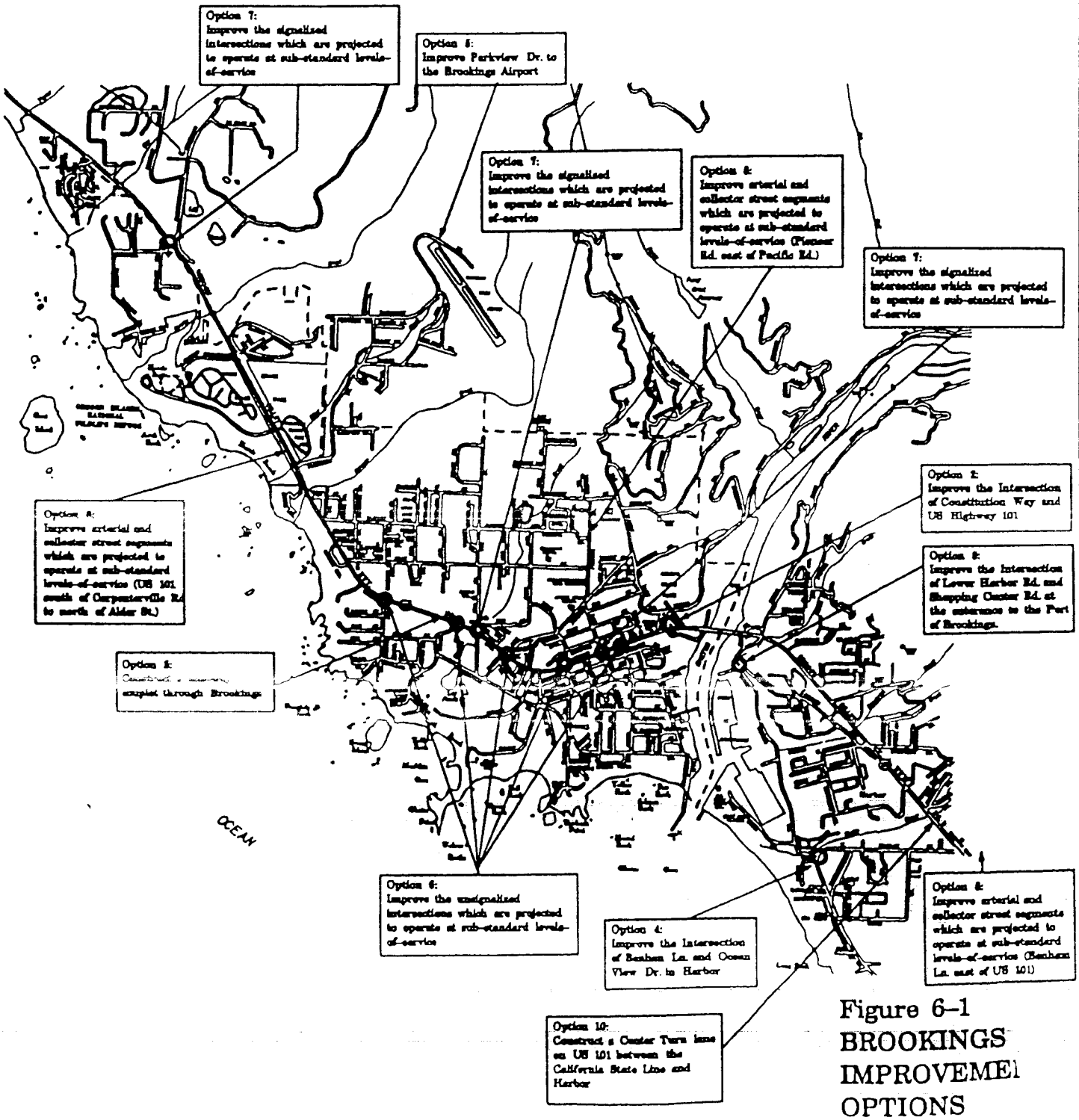

Figure 6–1
BROOKINGS
IMPROVEME
OPTIONS

congestion and delay, as well as vehicle miles traveled, because of the beneficial effects of those reductions.

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 1998 dollars based on preliminary alignments for each potential transportation system improvement.

IMPROVEMENT OPTIONS EVALUATION

Through the transportation analysis and input provided from the public involvement program, several improvement projects were identified. These options included reconstructing existing intersections and providing improved vehicular traffic flow.

Option 1. Revise Zoning and Development Codes to Encourage Proximity of Compatible Uses

Overview: One of the goals of the Oregon Transportation Planning Rule (TPR) is to reduce reliance on the single-occupant automobile. One method of reducing reliance on automobiles is to amend zoning and development codes to allow mixed-use developments and increased density in certain areas. Specific amendments include allowing neighborhood commercial uses within residential zones and allowing residential uses within commercial zones. Such code amendments can result in shorter travel distances between land uses, thereby encouraging residents to use alternative modes of transportation, such as walking and cycling throughout the community.

These code revisions are more effective in medium- to large-sized cities (with over 25,000 residents), than in cities such as Brookings, where they may not be as appropriate. Because of Brookings' relatively small size, the decision of what mode of transportation to use when making a trip inside the city is not as influenced by distance as in a larger city. The longest distance between city limit boundaries in Brookings is around two miles, meaning that many amenities are within walking distance of residents. Five percent of the population walks to work.

Increasing density may have some effect on development in Brookings. Projected population growth of 47 percent (approximately 7,640 additional residents) over the next 20 years is anticipated to be accommodated by infill development inside the city limits or by development of vacant land within the new UGB. Therefore, as city limits are expected to expand to include portions of the UGB, the provision of commercial uses close to or within these areas could become more important in reducing the need for automobile trips.

Impacts: The primary goal of these measures is to reduce the number of vehicle trips made within the city, especially during peak periods. However, changing land use codes to encourage some level of mixed uses to bring compatible uses closer together can keep the demand for vehicle capacity on the streets from becoming and issue, and can be beneficial for retailers and residents. Mixed uses can reduce the need for people to use their cars to go to work, or to run errands. In addition, more people walking and biking to work or for errands enhances the sense of community, local vitality, and security. With more emphasis on walking or biking in the city, conditions such as air quality and noise levels would be improved as well.

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

Recommendation: Because of the small size of the city, the relationship between land uses is already similar to the mixed use zoning patterns that are recommended in larger urban areas. It is desirable for this development pattern continue as the city grows (the population is forecast to increase by 47 percent, or 7,640 additional residents in the next 20 years). Increasing density requirements would have a positive effect on the way land is developed in Brookings by preventing urban sprawl. Therefore, revisions to zoning and development codes to allow for increased density is recommended.

Option 2. Improve the intersection of Constitution Way and US 101

Overview: The intersection of Constitution Way and US 101 was identified as a hazardous location due confusing and conflicting turn movements which occur along the entire length of Constitution Way between US 101 and the intersection of Old County Road and North Bank Chetco River Road. This street segment serves approximately 4,000 vehicles per day. Figure 6-2 shows the existing street configuration.

Constitution Way intersects US 101 directly across from Bridge Street. A left turn lane is provided for southbound US 101 and a channelized right turn is provided for northbound US 101 at the intersection. The right turn channel is separated from the rest of the intersection by a large section of painted pavement. A truck Weigh Station, which weighs northbound truck traffic is located on the highway just west of the intersection. Two truck access lanes are located on Constitution Way such that trucks traveling northbound on US 101 exit at Constitution Way to access the Weigh Station, and trucks coming from Old County Road or North Bank Chetco River Road and going to northbound US 101 also access the Weigh Station via Constitution Way. The two truck access lanes are separated by a another large section of painted pavement. The intersection of Constitution Way is a four-leg intersection, controlled on three legs by STOP signs; the fourth leg is one of the truck access lanes and is one-way, away from the intersection.

Constitution Way was identified as a safety issue because of the many turning movements which occur on this short street segment, the high volumes of slow moving trucks access the Weigh Station, and the vast stretches of pavement at the intersections. The most problematic part of the intersection is where trucks leaving northbound US 101 via the channelized right turn lane cross two lanes of Constitution Way to access the Weigh Station. Although accident records for the three-year period from 1994 to 1996 indicated one accident occurred during that period, the intersection was identified as hazardous by community members. Sight distance is the problem at the intersection of Constitution Way with North Bank Chetco River Road and Old County Road due to the skewed angle at which these roads meet. In addition, the wide expanses of pavement make pedestrian crossings unsafe. Although observed pedestrian volumes were low, there is potential for higher pedestrian volumes, due to the proximity of Azalea Park.

Three geometric improvement options were developed for this intersection which, to varying degrees, minimize the conflicting turning movements, reduce the expansive pavement widths, and separate the mix of auto and truck traffic.

Option 1: This option consists of eliminating the channelized right turn lane for northbound US 101 and replacing it with a right turn deceleration lane. The existing traffic would volumes warrant a right turn deceleration lane based on the National Cooperative Highway Research Program Report 279 Intersection Channelization Design Guide, Transportation Research Board. This is the simplest and lowest cost, of the improvement options. It addresses trucks leaving northbound US 101 via the channelized right turn lane and crossing two lanes of Constitution Way to access the Weigh Station. This option is shown in Figure 6-3.

Advantages of this option are that trucks would no longer cross both lanes on Constitution Way. Instead they would be in the northbound lane of Constitution Way and only cross the southbound lane. With this

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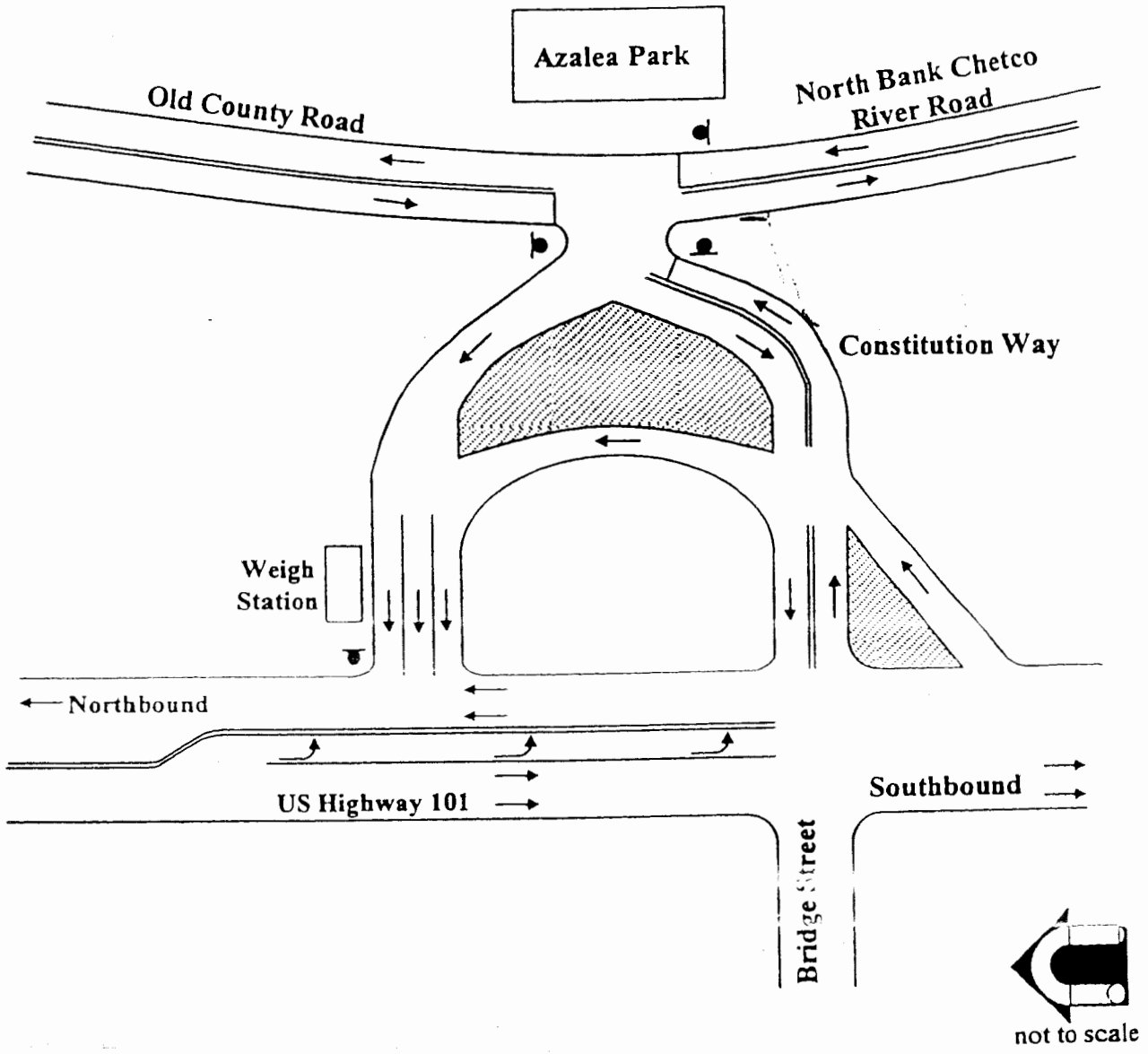
Constitution Way and Highway 101



LEGEND

- Painted Pavement
- Stop Sign
- Direction of Travel

Figure 6-2

Existing Conditions

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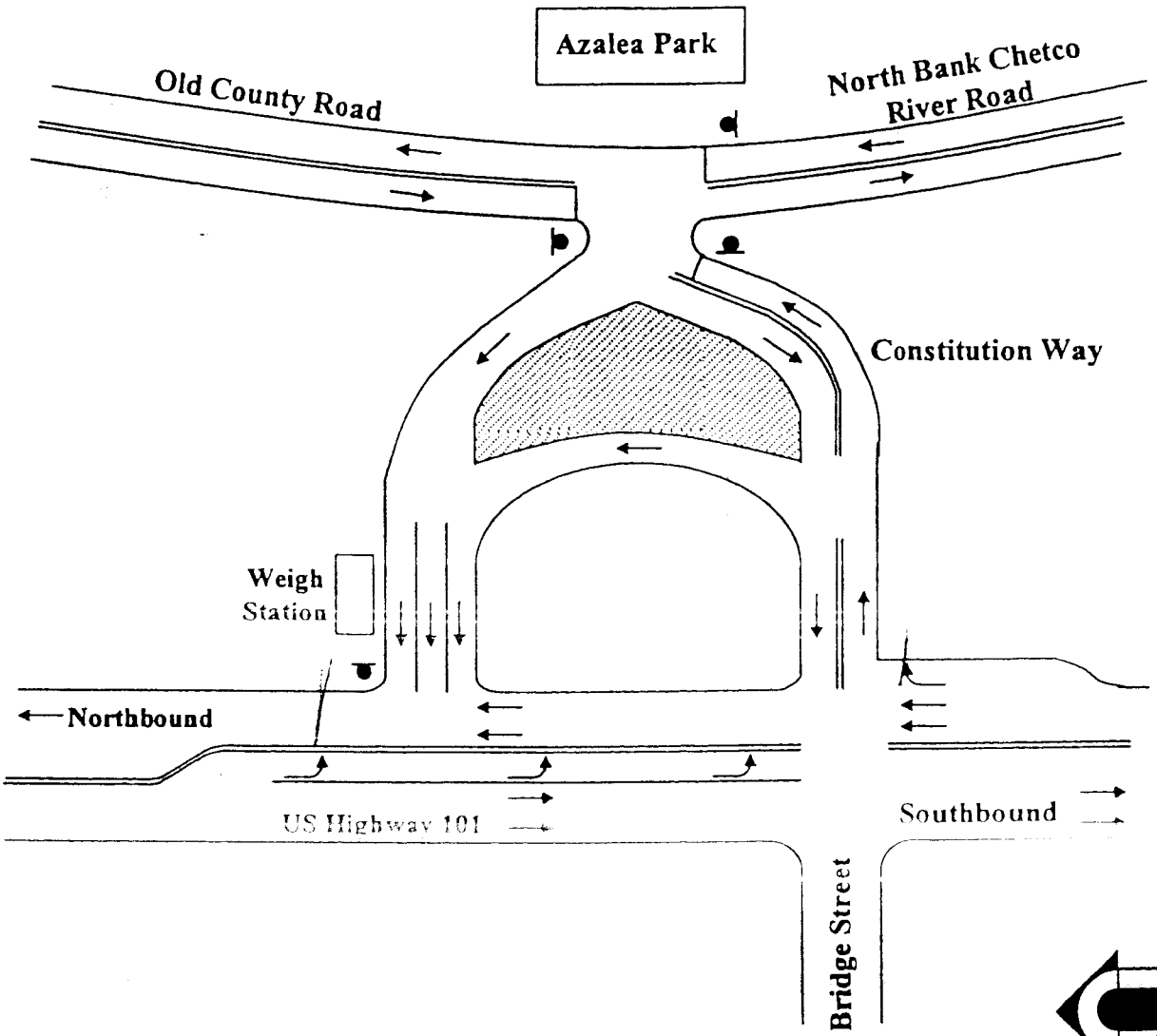
Constitution Way and Highway 101



LEGEND

- Painted Pavement
- Stop Sign
- Direction of Travel

Figure 6-3

Option 1

- Close Northbound Right-Turn Channel on Highway 101

configuration, northbound traffic on US 101 turning onto Constitution Way would access the street at the same place as southbound traffic on US 101, so this option eliminates the merge point on Constitution Way for all traffic. In addition, this option reduces the width of the highway access, an ODOT objective for state highways.

The disadvantages of this option are that it does nothing to reduce the expanse of pavement between the two truck access lanes and it does not improve the sight distance at the intersection with Old County Road and North Bank Chetco River Road.

The cost of this improvement would be approximately $50,000. This would cover the cost of a construction survey, removal and disposal of asphalt and temporary traffic control.

Option 2: This option consists of eliminating the channelized right turn lane for northbound US 101 and eliminating the southernmost truck access lane to the Weigh Station. This option addresses replacing it with a right-turn deceleration lane, trucks leaving northbound US 101 via the channelized right turn lane and crossing two lanes of Constitution Way to access the Weigh Station. This option also eliminates mid-block left turns into the weigh station. This option is shown in Figure 6-4.

Advantages of this option are that trucks would no longer cross Constitution Way mid-block to access the Weigh Station. Instead they would make this turn at the STOP-controlled intersection of Constitution Way with Old County Road and North Bank Chetco River Road. With this configuration, northbound traffic on US 101 turning onto Constitution Way would access the street at the same place as southbound traffic on US 101, so this option eliminates the merge point on Constitution Way for all traffic. Another advantage of this option is that it eliminates both large areas of painted pavement that make pedestrian crossings difficult. In addition, this option reduces the width of the highway access, an ODOT objective for state highways.

Construction of Option 2 could be phased, first correcting the intersection of Constitution Way and US 101 and later closing the south truck access lane to the Weigh Station. The latter part can be done with concrete Jersey barriers, a quick, low cost improvement which would not require the cost of pavement removal and can even be done on a trial basis. If the community is unhappy with the way the intersection operated after the change, it could easily be changed back to the configuration shown in Option 1 by removing the Jersey barriers. If the community likes the way the new configuration functions, but is unhappy with the look of the Jersey barriers, the pavement could be removed, a curb constructed, and the area replanted.

The disadvantage of this option is that it does nothing to improve the sight distance at the intersection with Old County Road and North Bank Chetco River Road.

The cost of this improvement would be approximately $100,000. This would cover the cost of a construction survey, removal and disposal of asphalt, construction of new curbs, replanting and temporary traffic control.

Option 3: This option consists of eliminating the channelized right turn lane for northbound US 101, realigning Constitution Way such that it intersects Old County Road and North Bank Chetco River Road at a 90° angle, and relocating the Weigh Station to US 101. This option addresses all of the safety issues identified with this intersection: trucks leaving northbound US 101 via the channelized right turn lane and crossing two lanes of Constitution Way to access the Weigh Station, conflicts between auto and truck traffic on Constitution Way and large areas of pavement making pedestrian crossings difficult. This option is shown in Figure 6-5.

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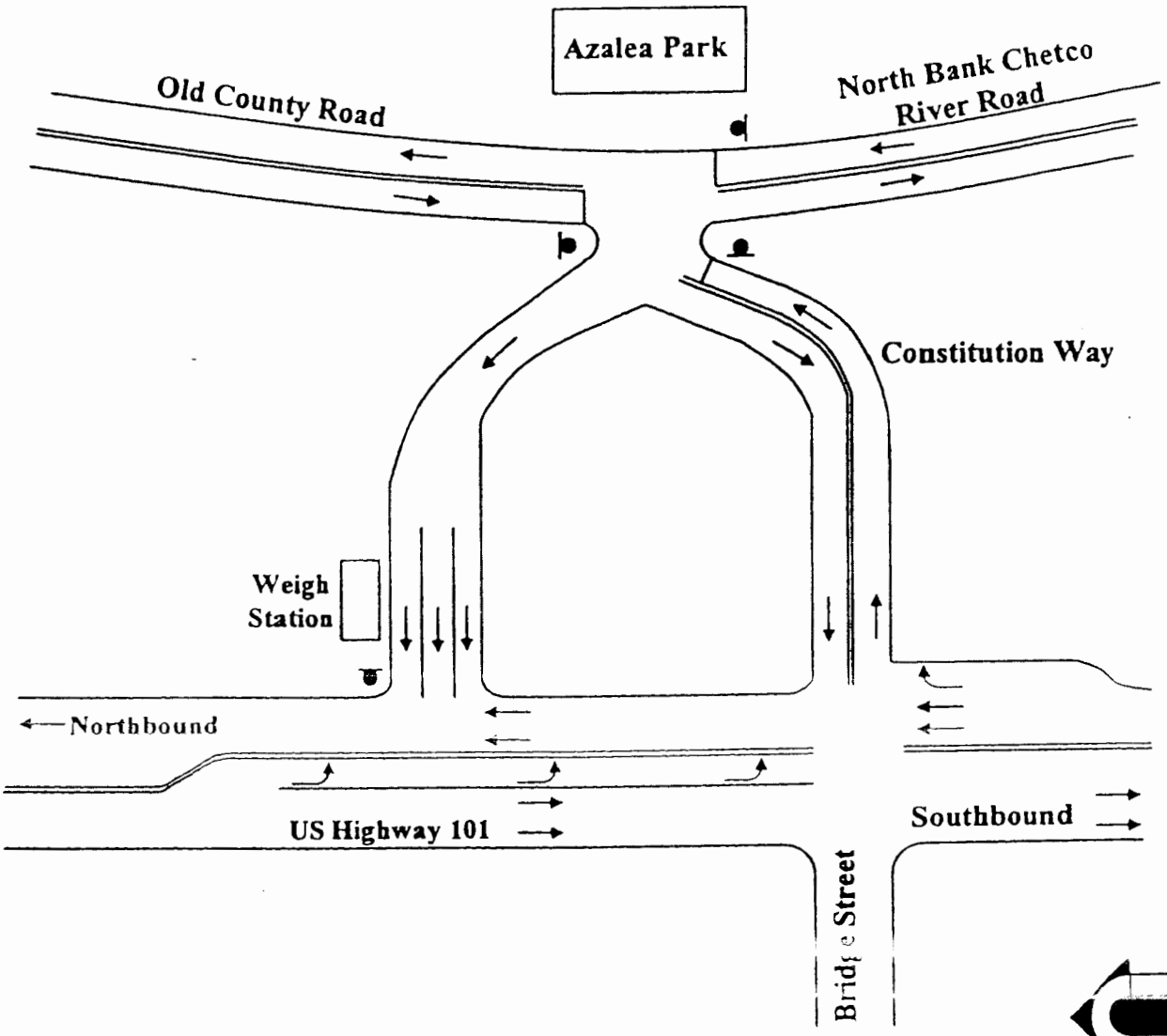
Constitution Way and Highway 101



LEGEND

- Painted Pavement
- Stop Sign
- Direction of Travel

Figure 6-4

Option 2

- Close Northbound Right-Turn Channel on Highway 101.
- Close Southern Most Truck Access Lane.

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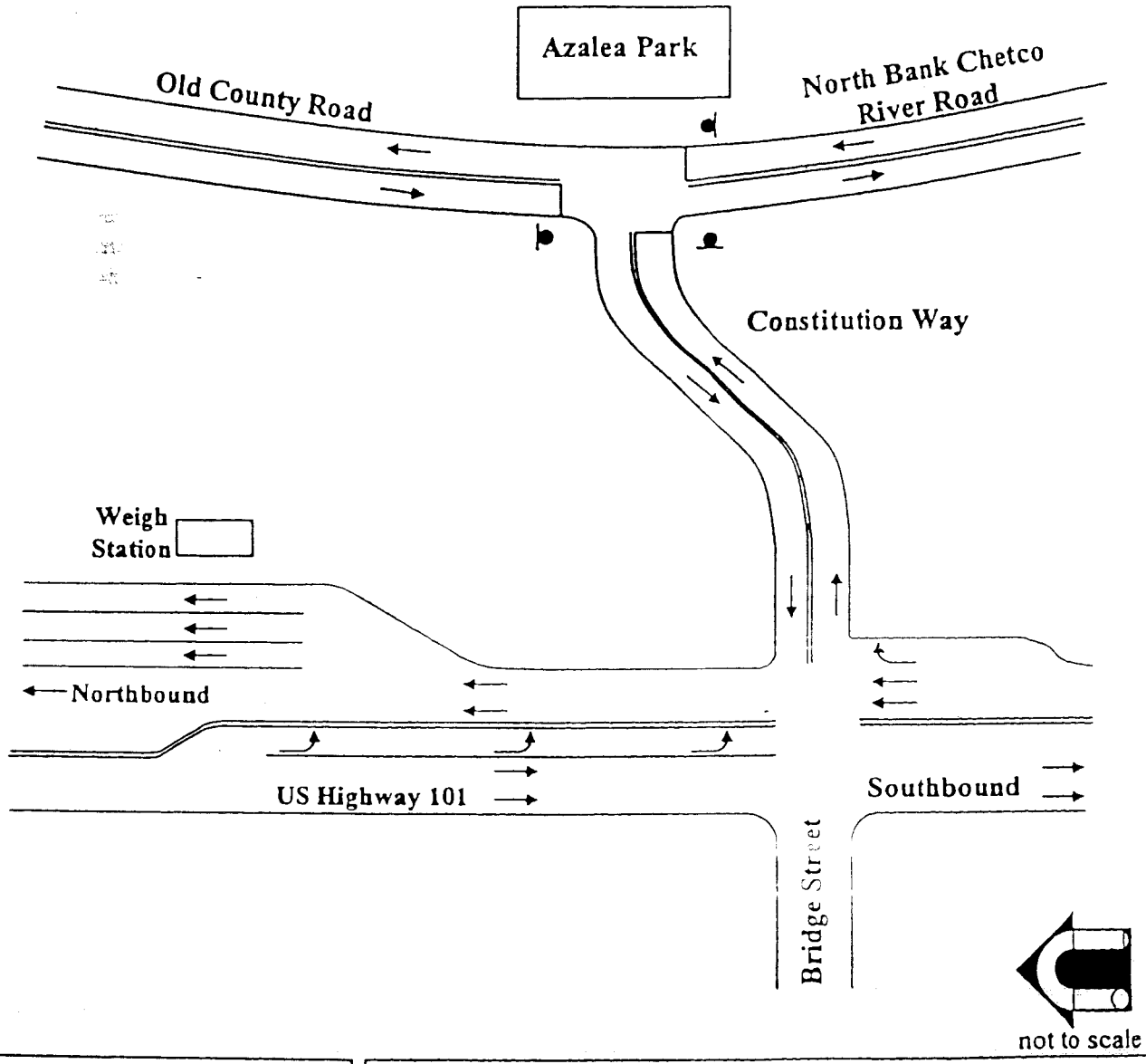
Constitution Way and Highway 101



LEGEND

- Painted Pavement
- Stop Sign
- Direction of Travel

Figure 6-5

Option 3

- Close Northbound Right-Turn Lane Channel on Highway 101.
- Realign Constitution Way.
- Relocate Weigh Station on Highway 101.

Advantages of this option are that trucks would no longer cross Constitution Way mid-block to access the Weigh Station. The Weigh Station would be accessed directly from US 101. With this configuration, northbound traffic on US 101 turning onto Constitution Way would access the street at the same place as southbound traffic on US 101, so this option eliminates the merge point on Constitution Way for all traffic. This option also improves sight distance at the intersection of Constitution Way with Old County Road and North Bank Chetco River Road, and eliminates one leg of the intersection. Another advantage of this option is that it eliminates both large areas of painted pavement, which make pedestrian crossings difficult. In addition, this option reduces the width of the highway access, an ODOT objective for state highways. The disadvantage of this option is that it is the highest cost option.

The cost of this improvement would be approximately $340,000. This assumes a cost of $140,000 for a construction survey, removal and disposal of asphalt, new asphalt, curbs and striping, and temporary traffic control on Constitution Way, and $200,000 to relocate the Weigh Station.

Recommendation: Option 1 is recommended because it addresses: conflicting turning movements, merge points, and pedestrian safety and has the lowest estimated cost. It also reduces the width of the highway access. It does not, however, come with the high cost of relocating the weigh station and completely realigning Constitution Way as shown in Option 3.

In addition to the geometric improvements at this intersection, members of the Transportation Advisory Committee identified the need for a traffic signal at the intersection of Constitution Way and Highway 101 to reduce delays and improve safety for vehicles turning from Constitution Way (and Bridge Street, on the other side of the highway). Examination of p.m. peak hour traffic volumes (existing peak hour volumes are shown in Figure 4-4, 20-year forecast volumes are shown in Figure 5-4) indicated that this intersection would meet the peak hour traffic volume warrant for a traffic signal even in the existing condition. (Other traffic signal warrants were not examined due to a lack of four-hour and eight-hour traffic volumes.) Because the peak hour traffic volume warrant is already met, and the four-hour and eight-hour volume warrants will likely be met in the near future (if not met already), based on the 20-year traffic forecasts, a traffic signal is recommended for this intersection in addition to the geometric improvements shown in Option 1. The cost of a traffic signal is approximately $120,000, bringing the total cost of constructing Option 1 and a traffic signal to $170,000.

Option 3. Improve US 101 from north of Carpenterville Road to Ransom Ave.

Overview: The considerable amount of population and economic growth in Brookings has added demand to US 101. The highway serves both commercial and recreational travel as the city's only arterial extending through the center of the city. This increase in demand has led to the development of alternatives to manage future travel demands. The operational analysis shows US 101 between Carpenterville Road and Ransom Ave. is expected to fall below acceptable performance standards by the year 2017.

Potential improvements along this section appear to be primarily limited to widening of the highway. Some capacity relief may be realized through improving sight distances along the highway, by limiting new accesses, and through the construction of parallel routes. However, topography, the location of Harris Beach State Park, and the limited residential development along this segment all mean that parallel connections will likely not have a significant impact on improving capacity. A large mixed-use and residential development owned by Borax at Lone Ranch Creek that would impact this segment of highway has been proposed to the city. The impacts of the 20-year build out of Lone Ranch Creek is significant to US 101. Initial analysis estimates the V/C is projected to be over 1.00 in 2017 from north of Carpenterville Road to south of Alder Street. A traffic impact study for the development, including a sensitivity analysis will be conducted for the build out of Lone Ranch Creek to determine the level of

development that can be achieved without considering extra travel lanes on US 101 to achieve acceptable standards for turn movements onto US 101, as well as travel along the highway itself.

At the time of TSP adoption, it was assumed that the Lone Ranch Creek site would be served by four access points on US 101, although the final number, location, and configuration of these accesses will be determined through discussions between the developer, ODOT, and the City. The Lone Ranch Creek development is anticipated to be phased, resulting in these accesses being improved over time. As initially discussed, the most northern access would serve a hotel, golf course, and up to 35 single family lots. This part of the Lone Ranch Creek development is expected to be the last phase of development. The two middle access points would serve the majority of the Lone Ranch Creek site. The northern of these two access points would serve as a secondary access point, while the southern would be the main access point to Lone Ranch Creek, serving the community college, retail, multi-family, and single family uses. The fourth, most southern access point would be a fire/emergency access and would not be intended to serve general traffic.

Because the traffic analysis related to this development was not complete by the time of TSP adoption, specific safety and capacity improvements will be determined through the completion of a traffic impact study as part of the master planning process. However, while capacity improvements may not be needed initially at Lone Ranch Creek, they will likely be needed during later stages of the development. The traffic impact study will detail the extent, timing, and cost of needed improvements.

Regardless of capacity needs, it is likely that safety and operational improvements will be required on the highway at the Lone Ranch Creek accesses due to the rural nature, travel speeds, and topography of the highway segment. Safety improvements may include left turn pockets, right turn/deceleration lanes, and acceleration lanes and will be negotiated with ODOT and installed as warranted.

Any changes to the highway that may be needed to accommodate traffic generated by the development, including the addition of turn lanes, must be reviewed and approved by the Region and State Traffic Engineers. Full build out of the development is expected to require more significant improvements, although the type and design of those improvements will not be known until the traffic analysis is completed and approved by ODOT. These improvements will also have to be approved by the State Traffic Engineer and will have to be consistent with the design, topographic, and rural characteristics of the highway in the area.

Impacts: More detailed study is need for this segment to determine the impacts of potential development and possible mitigation.

Cost Estimate: Cost associated with improvements should be determined in conjunction with more detailed study of future development in the area.

Recommendation: The city and may approve the incremental development of Lone Ranch Creek as defined above with the identified mitigation measures once the traffic impact analysis is reviewed and confirmed by ODOT. This study must include existing and future (20-year) traffic impacts, including capacity and safety, as well as appropriate mitigation and costs.

Option 4: Construct the US 101 couplet in the City of Brookings

Overview: The considerable amount of population and economic growth in Brookings has added demand to US 101. The highway serves both commercial and recreational travel as the city's only arterial extending through the center of the city. This increase in demand has led to the development of alternatives to manage future travel demands. The operational analysis shows US 101 between Ransom Ave. and Alder Street is expected to fall below acceptable performance standards by the year 2017.

The Options described below should only be considered preliminary. An Environmental Analysis (EA), as required by ODOT, will provide a more complete evaluation of the couplet alternative discussed above, as well as other possible improvement scenarios. The EA will evaluate deficiencies in the downtown area, as well as alternative mitigation solutions. The outcome of the EA will determine the types of improvements and general alignments to be constructed in the downtown. Should the couplet continue to be the preferred solution, changes may also occur to the City's preferred alignment in response to available funding, environmental analysis, or other considerations.

A previous study, Brookings/US 101 One-Way Couplet Analysis conducted by W&H Pacific, discusses the one-way couplet alternatives for US 101 in Brookings. Four alternatives were evaluated:

- No Build Alternative. This scenario accommodates future traffic volumes on the existing roadway conditions without any improvements to the roadway.
- Alternative A. This alternative constructs a one-way couplet using Chetco Avenue and Railroad Street between Mill Beach Road on the north and Alder Street on the south. See Figure 6-6.
- Alternative B. This alternative constructs a one-way couplet using Chetco Avenue and Railroad Street between 5th Street on the north and Oak Street on the south. See Figure 6-7.
- Alternative C. This alternative recommends widening Chetco Avenue to six lanes from Easy Street to the south of Alder Street. See Figure 6-8.

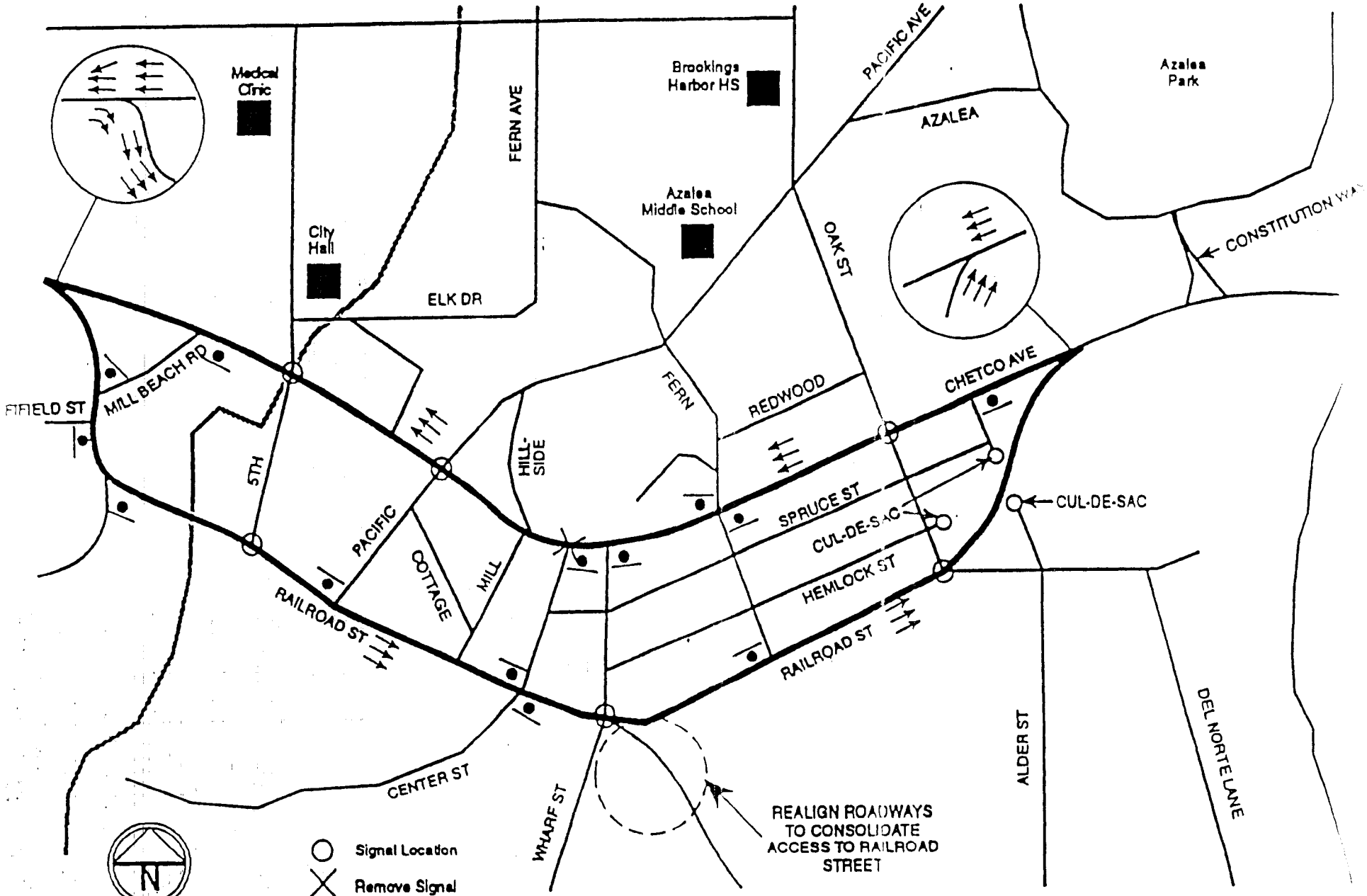
As a result of this study, Alternative A was chosen as a preferred alternative by the project management team, with input from an advisory team and the public. The project management team comprised representatives from the City of Brookings, Curry County, and the Oregon Department of Transportation. The advisory committee included selected members of the community. Public input was obtained from a project newsletter and an open house.

The other one-way couplet alternatives were rejected based on necessary restrictions on local access and local circulation. Widening of existing Chetco Avenue to six through lanes was rejected because of the expected impacts to businesses along the highway. A comparison of the advantages and disadvantages of a one-way couplet and a six-lane Chetco Avenue was included in the Brookings/US 101 One-Way Couplet Analysis.

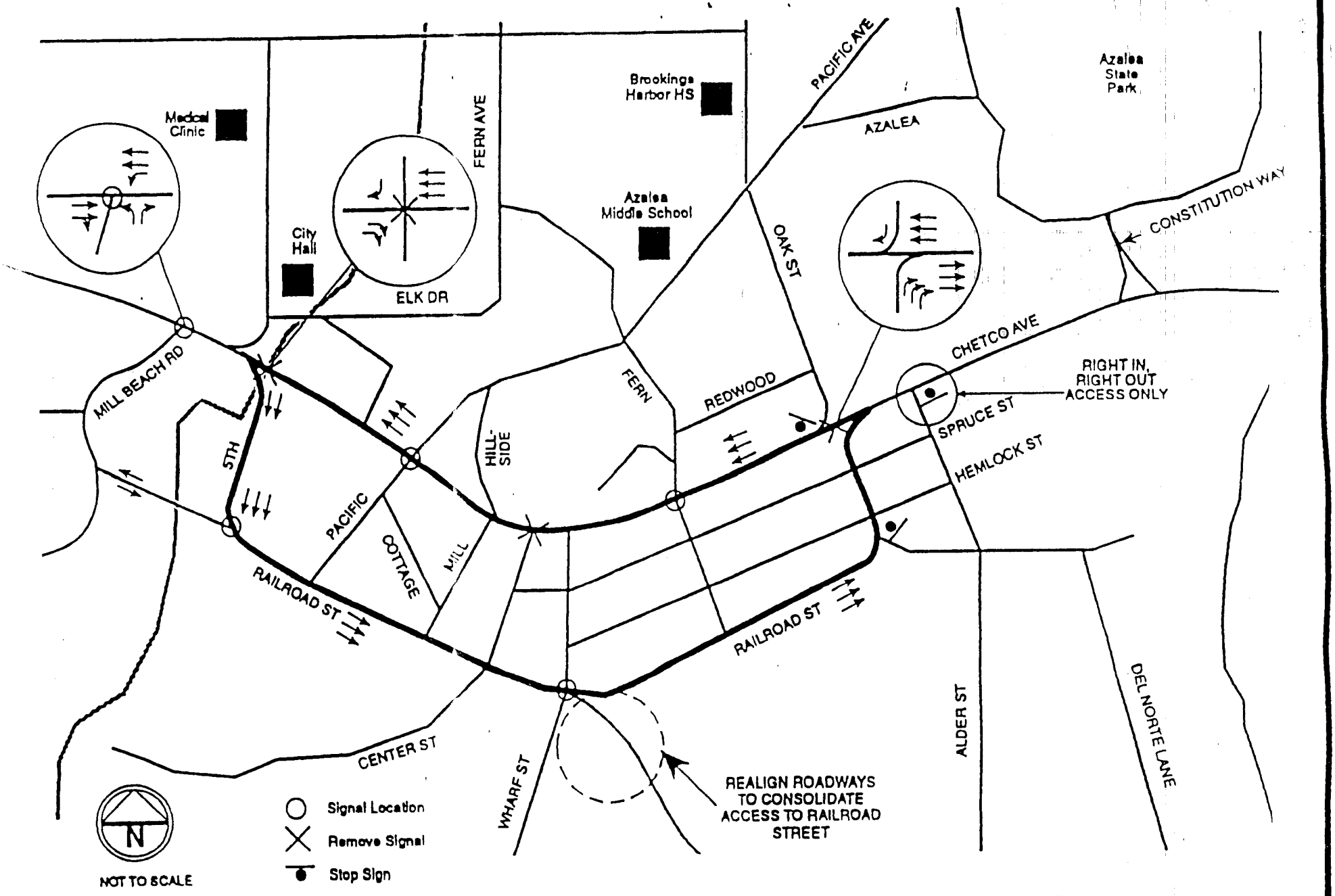
The Options described below should only be considered preliminary. An Environmental Analysis (EA), as required by ODOT, will provide a more complete evaluation of the couplet alternative discussed above, as well as other possible improvement scenarios. The EA will evaluate deficiencies in the downtown area, as well as alternative mitigation solutions. The outcome of the EA will determine the types of improvements and general alignments to be constructed in the downtown. Should the couplet continue to be the preferred solution, changes may also occur to the City's preferred alignment. in response to available funding, environmental analysis, or other considerations.

Impacts: The City of Brookings expecting a substantial amount of growth in the next 10 to 20 years, leading to additional demands on the transportation system. Transportation improvements are needed to accommodate the project future growth and travel demand. The one-way couplet accommodates the existing and future traffic growth and future land use developments.

The roadway alternatives were evaluated against each other using several measures of effectiveness including cost, safety, parking, pedestrian mobility, system continuity, and level-of-service. Alternative A was the most expensive of the alternatives, where as Alternative B and C were relatively the same. In comparing the different alternatives, Alternative A is likely safer than the other alternatives because the travel pattern is more direct and there are fewer conflicting vehicle movements. Narrower lane widths allow pedestrians to cross more easily. Alternative A will also operate at a better level-of-service than the



CITY OF BROOKINGS ***HIGHWAY 101*** ***ONE-WAY COUPLET ANALYSIS***	***ALTERNATIVE A*** ***ONE-WAY COUPLET ALIGNMENT***	**FIGURE 6-6**	***PREPARED BY PARAMETRIX FOR THE SOUTH COAST TRANSPORTATION STUD***



CITY OF BROOKINGS HIGHWAY 101 ONE-WAY COUPLET ANALYSIS	*ALTERNATIVE B* *ONE-WAY COUPLET ALIGNMENT*	FIGURE 6-7	PREPARED BY PARAMETRIX FOR THE SOUTH COAST TRANSPORTATION STUDY

other alternatives. Both Alternatives A and B will maintain the existing on-street parking, while Alternative C will eliminate the on-street parking. All the alternatives have adequate pedestrian facilities. Alternative C has the best system continuity since it most reflects exists today, but Alternative A would have a better continuity than Alternative B. Alternatives A and B would have a slightly better level-of-service than the Alternative C.

US 101/Chetco Avenue is a three- to five-lane road with parking on both sides in many sections. Chetco Avenue is located within an 80 to 100 foot right-of-way, which is sufficient for establishing the northbound leg of a couplet system. Railroad Avenue varies from 70 and 100 feet of right-of-way, with two travel lanes. Right-of-way acquisition would be necessary on the northern and southern connections between Railroad Street and Chetco Avenue. Approximately 4.4 acres of right-of-way will be required to develop the recommended alternative.

Parking is a key issue for both business owners and patrons. Parking would be located throughout the downtown and maintained with the preferred alternative. Parking will be provided on at least one side of both streets for approximately half the length of each street. Side streets will allow parking on both sides of the street. Parking recommendations in the study include time limits and striping of stalls as a way to encourage turnovers in parking. Other recommendations include providing off-street parking where applicable.

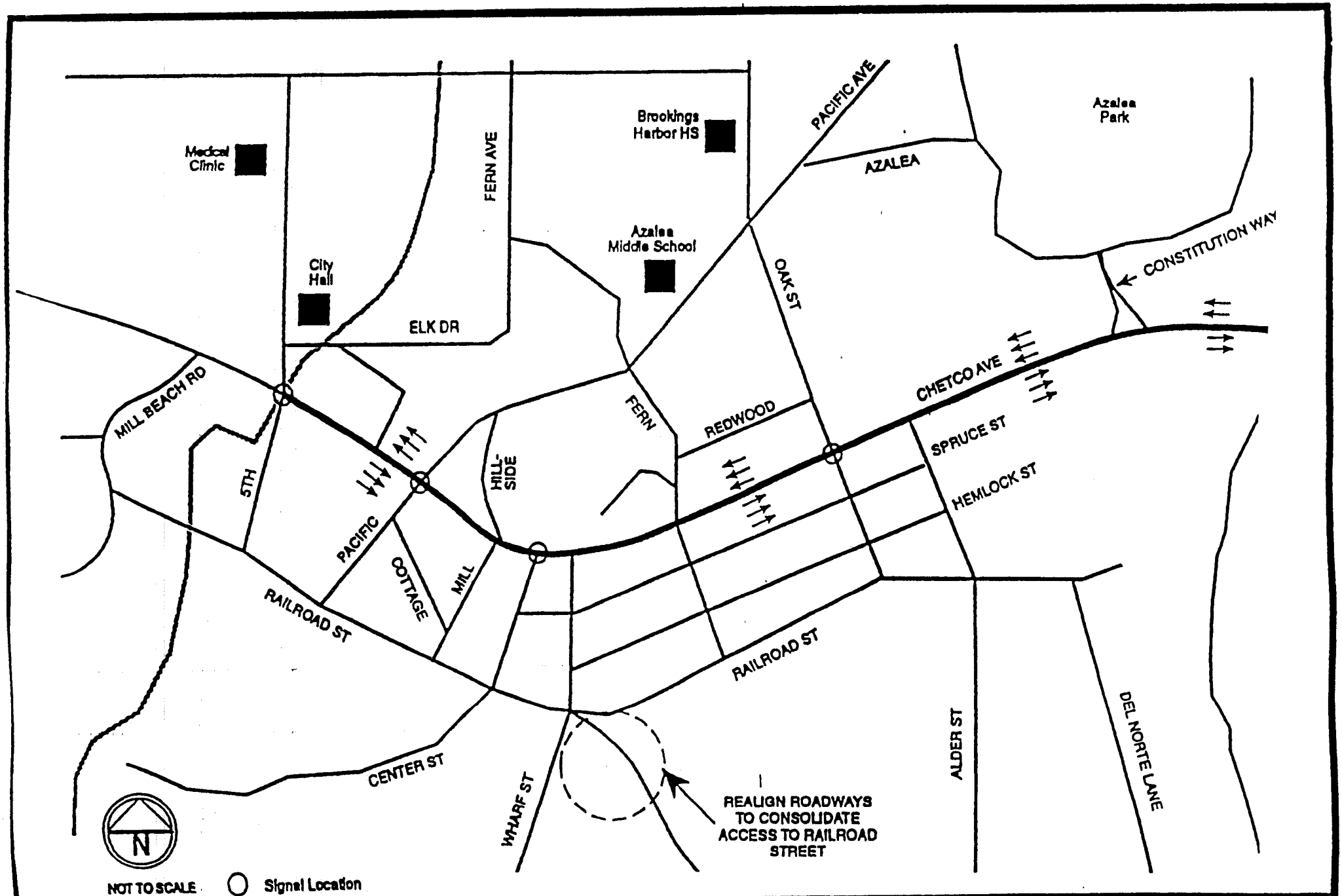
Cost Estimate: W &H Pacific estimated the total cost for one-way couplet is $9,575,000. This estimate includes a construction cost of $7,325,000 and a right-of-way cost of $2,250,000. Updated cost estimates created by ODOT are closer to $13-14 million. A more detailed cost estimate will be conducted through the project design process.

Recommendation: The EA required for the downtown improvements will provide more complete analysis of a range of options for capacity improvements in the downtown, as well as provide additional opportunities for public input into the process. Below is a description of the city's recommendation for downtown improvement at the time of TSP adoption. Once completed, the results of the EA will provide the preferred alternative regarding the type, scale and configuration of the required improvements. The preferred alternative will become the improvement scenario planned for downtown.

Alternative A was identified as the preferred alternative and the most effective one-way couplet alternative. However, changes to the final configuration will likely be required based on funding and environmental and land use considerations. As currently configured, the northern terminus of the couplet would be located at north of Mill Beach Road and the southern terminus south of Alder Street. Acquisition of several buildings fronting US 101 will be required to ensure a smooth transition from US 101 to Railroad Street. Several mobile/manufactured homes along Mill Beach Road, and the existing Dairy Queen and small retail/commercial building along Alder Street may be needed for sufficient right-of-way.

Along US 101, traffic signals will be necessary at the intersections of US 101 and 5th Street, US 101 and Center Street, and US 101 and Oak Street to allow an east-west circulation across US 101. Traffic signals along Railroad Street will be needed at the intersections of Railroad Street and 5th Street, Railroad Street and Center Street, and Railroad Street and Oak Street. Enhancement or realignment of Cove Road and Memory Lane to Wharf Street should be considered to encourage traffic to use the signal at Railroad Street and Wharf Street. The other intersections along Railroad Street should operate as stop-controlled intersections. Ultimately the location of new signals will be determined at the engineering and construction phases of the couplet project.

Spruce Street will be converted to a cul de sac in the vicinity of Railroad Street to reduce access points. Alder Street and Railroad Street will be restricted to right-turn in, right-turn out and vacated between



CITY OF BROOKINGS
HIGHWAY 101
ONE-WAY COUPLET ANALYSIS

ALTERNATIVE C
6-LANE WIDENING

FIGURE 6-8

PREPARED BY PARAMETRIX FOR THE SOUTH COAST TRANSPORTATION STUDY

Railroad Street and US 101. Westbound access from Arnold Street and US 101 should be restricted to right turn in, right turn out to avoid any conflicts with the couplet. This alternative will improve the operation and the level-of-service for the intersection of US 101 and Arnold Street. In addition the intersection of US 101 and Mill Beach Road will operate at a better level-of-service with the westbound approach restricted to right-turn only.

Based on adjacent land uses W&H Pacific developed three specific cross-section standards for the US 101 one-way couplet: These should be considered suggested standards; specific design will be determined during the project development process, with direction from the current ODOT Highway Design Manual.

Standard for US 101 Couplet – Section "A"

This cross section consists of three 12-foot travel lanes, a six-foot bike lane on the right side of the road, and no on-street parking. The resulting paved width is 42 feet. This option also includes eight feet for sidewalks. This cross section was designed to fit within a 70-foot right-of-way and would be used in the northern and southern segments of the couplet, where sufficient on-site parking exists for local businesses. Specifically, this cross section could be used on the southbound roadway from the north end of the couplet to Wharf Street and from Oak Street to the south end of the couplet. It could also be used on the northbound roadway from Alder Street to Oak Street and from 5th Street to the north end of the couplet.

Standard for US 101 Couplet – Section "B"

This cross section consists of three 12-foot travel lanes, a six-foot bike lane on the right side of the road, and on-street parking on both sides of the roadway. The resulting paved width is 58 feet. This option also includes eight feet for sidewalks. This cross section was designed to fit within an 80-foot right-of-way and would be used on the segments of the couplet which are close to the core of downtown Brookings, where there are existing residential uses, and where commercial development is adjacent to the sidewalk. Specifically, this cross section would be appropriate on the southbound roadway from Wharf Street to Oak Street and on the northbound roadway from Fern Street to 5th Street.

Standard for US 101 Couplet – Section "C"

This cross section consists of three 12-foot travel lanes, a six-foot bike lane on the right side of the road, and on-street parking on the left side of the roadway. The resulting paved width is 50 feet. This option also includes eight feet for sidewalks. This cross section was designed to fit within a 70-foot right-of-way and would be used in the vicinity of the car dealership. This configuration was designed to preserve access and visibility of this business. Security issues were raised with respect to allowing parking along the face of the dealer's show-space. This roadway cross section provides a transition between Sections A and B. Specifically, this cross section could be used on the northbound roadway from Oak Street to Fern Street.

Option 5. Improve the intersection of Benham Lane and US 101 in Harbor

Overview: Benham Lane intersects US 101 at a skew and is controlled by a traffic signal. West Benham Lane is a secondary access to the Port of Brookings. With some exceptions, lands in the Port area are developed, although a new convention center and motel have been discussed for the area, as well as additional commercial and residential development.

East Benham Lane leads to lands currently under consideration for residential development and was initially identified as the likely primary access. However, additional connections to the development may be considered, based on preliminary access information obtained from the developers of North Harbor Hills and Harbor Hills. These additional connections may draw traffic from Benham and distribute it to other intersections along the highway. However, more complete traffic study of the impacts of the developments, including future year impacts and likely trip distribution is needed to estimate likely performance of the intersection. This analysis may also need to consider a north-south collector parallel to US 101 to help trip distribution and reduce impacts to the highway.

Impacts: The TSP analysis did not allow for sufficient modeling of all of these potential developments, particularly when taken in aggregate. Initial analysis of these developments indicates that traffic generated by the Harbor Hills developments could be distributed through a number of access points along US 101. However, completion of the traffic impact study for the area is required to determine the appropriate transportation network for the area. Initial discussions of additional connections include four access points to South Bank Chetco Road are planned at Payne, Salmonberry, a new road between Salmonberry and Campbell, and Campbell. Additional access points to US 101 may be utilized depending on the outcome of the final traffic impact study. These may include Hoffeldt Lane, Behnam Lane, Museum Road, McVay Lane, and Foral Hill.

Recommendation: The city will require completion of the traffic impact study and approval by ODOT prior to approval of the development master plans and/or zone changes. The study should include a discussion of trip distribution, including a collector street parallel to the highway. Any connections to the highway should be built to city collector standard, allowing for modifications for topography.

Cost: No costs for improvements at the intersection have been developed. Any traffic impact study completed in conjunction with development in the area should include mitigation cost estimates and a discussion of cost-sharing responsibilities.

Recommendation: The city will require a traffic impact study in conjunction with any development proposed to impact the US 101/Benham Lane intersection. The study should include a discussion of trip distribution, including a collector street parallel to the highway, and future year analysis in order to accurately estimate future performance of the intersection.

Option 6. Improve the intersection of Benham Lane and Ocean View Drive in Harbor

Overview: Ocean View Drive intersects Benham Lane at a "T" intersection controlled by a STOP sign. Intersection sight distance on Ocean View Drive is extremely poor to the left (to the west). This is due to the skewed angle at which the two roads intersect and the grades on both roads. Ocean View Drive slopes down to the north at a grade, which is over five percent where it intersects Benham Lane. The grade on Benham Lane is smaller, and this road slopes down from the east to the west (from US 101 to the ocean). A two-foot high concrete wall on the southwest corner contributes to the poor sight distance.

Two improvement options were evaluated for this intersection. The first is a low cost option that improves sight distance without realigning the roadways. The second improves sight distance by realigning Ocean View Drive. These short-term improvements are considered with the understanding that this intersection will be included in any larger study conducted in conjunction with alternatives for the US 101/Benham Lane intersection.

Option 1: The first option consists of removing the two-foot high concrete wall which lies along the west side of Ocean View Drive. This concrete wall contributes to the poor sight distance for vehicles on the Ocean View Drive approach. The wall supports a chain link fence that was installed for pedestrian safety. It prevents pedestrians on Ocean View Drive from falling down the embankment to Benham Lane. The

chain link fence should be reinstalled, at ground level, once the concrete wall is removed. The chain link fence would not result in the same visual barrier as the concrete wall and will make traffic on Benham Lane more visible to drivers stopped on Ocean View Drive, and vise versa. In addition, a convex mirror should be installed on Benham Lane, directly across from, and facing, Ocean View Drive. This is a typical treatment used on blind corners. The cost for these improvements would be approximately $10,000.

The advantage of this improvement is that it improves sight distance without costly road reconstruction. The disadvantage of this improvement is that it does not improve the horizontal and vertical curves on the two roads, the primary reason for the poor sight distance.

Option 2: The second option consists of realigning the northbound approach lane on Ocean View Drive to the east such that it effectively becomes a channelized right turn lane eventually paralleling Benham Lane before merging with it, much like an acceleration lane. The cost of this improvement would be approximately $50,000.

The advantage of this improvement is that it makes vehicles on Ocean View Drive more visible to drivers traveling east on Benham Lane. The disadvantages of this improvement are that it does not significantly improve sight distance to the west for drivers on Ocean View Drive, it would displace the sidewalk and bike lane on the south side of Benham Lane, and it involves costly road reconstruction.

Recommendation: Option 1 is recommended for this intersection, primarily based on the lower cost, and because it improves sight distance for both traffic on Benham Lane and Ocean View Drive and because the improvements all lie off-road, it would not disrupt traffic during construction or permanently disrupt the sidewalks and bike lane on Benham Lane.

This intersection will be included any study that investigates impacts to the US 101/Benham Lane intersection.

Option 7. Improve Parkview Drive to the Brookings Airport

Overview: Parkview Drive serves as the primary access to the Brookings Airport. The road is narrow, winding, and requires low speeds. To improve access to the airport, Parkview will require significant realignment and improvement or an alternative access route must be developed. For the 20-year planning period Parkview Drive is inadequate to accommodate the future development.

Land use along Parkview Drive is mostly residential with some commercial development on the east side of the airport. There are some large lots available for development and as development increase the roadway will need to be upgraded.

Parkview Drive is two miles in length extending from US 101 to the Brookings Airport. The road extends mostly through residential areas and serves as the primary access to the Brookings Airport. The existing roadway is a two lane, approximately 22 feet in width with shoulder. Parkview Drive is currently identified as a collector by the City of Brookings and Curry County. Most of the roadway is in Curry County's jurisdiction. Ideally, the desired improvements along the roadway are to bring the road to collector standards and construct continuous sidewalk along the roadway. The standard for collectors consists of two 11-foot travel lanes and seven-foot parking strips on both sides of the roadway. The resulting paved width would be 36 feet. The standard also includes five-foot sidewalks, adjacent to the curbs. This option fits within the city's required right-of-way of 50 feet.

The intersection of Parkview Drive and US 101 will become more and more important to the transportation network of the city as future development proceeds. US 101 is the only arterial and serves

as the "Main Street" through the downtown. As development along Parkview Drive continues, the traffic along this collector will increase. Improvements to the intersection will be required to accommodate the future travel demand. Currently, a connection between Parkview and either 3rd or 5th Street may have some benefit, but is not justified in terms of the likely cost. However, future development between Carpenterville Road and the airport will likely impact the highway to the extent that such a parallel connection is needed. Any traffic impact study completed in conjunction with such development will need to investigate the affects of a parallel connection between the downtown and Parkview.

Impacts: Some property owners may perceive the widening as losing the rural character of the roadway. In actuality the roadway is made safer and more efficient by upgrading the roadway to standards set by the city and the county. This can be accomplished within the city's right-of-way and will improve the safety and sight distance on the roadway. Widening the roadway increases vehicles ability to share the roadway with no impediments to two-way traffic. Sidewalks create a safer environment for pedestrians. Upgrading Parkview Drive improves the level-of-service and safety of the roadway with no negative impacts to surrounding land uses.

Costs: To upgrade this roadway to collector standards, a unit cost of $300,000 per mile was used. The total estimated cost is $600,000. Costs associated with the creation of a connection between Parkview and either 3rd or 5th Street were not developed because of the deep Ransom Creek ravine separating the two areas but further study should be considered to determine the feasibility of a connection.

Recommendations: Parkview Drive should be improved and upgraded to the standards set by the city and the county. Improvements to the intersection of Parkview Drive and US 101 will be necessary as future travel demand grows. As traffic to the airport and the surrounding area increases, improvements to Parkview Drive are going to be more important. The city and the county alike see this improvement as an important element in the future planning of the roadway.

Option 8: Improve the unsignalized intersections which are projected to operate at sub-standard levels-of-service

Overview: US 101 is the only arterial within the study area. Although the side streets along US 101 do not contribute a significant amount of traffic to the highway, the traffic along the highway is high enough to cause delay on the side streets, causing a poor level-of-service at these intersections. Delays are primarily due to heavy traffic volumes on US 101/ Chetco Avenue conflicting with the minor streets turning movements on and US 101 left-turning volumes. All of the unsignalized intersections analyzed are projected to operate below acceptable V/C standards in the 2017 condition. These include:

- US 101-Carpenterville Road/Dawson Road
- US 101-Chetco Avenue/Arnold Lane
- US 101-Chetco Avenue/Pacific Avenue
- US 101-Chetco Avenue/Fern Avenue
- US 101-Chetco Avenue/Alder Street

The unsignalized intersection of US 101 and Constitution Ave. also functions below acceptable standards, but is discussed separately in Option 2 above.

It may be desirable to set a lower level-of-service standard for unsignalized intersections since cost-effective solutions are limited. However, alternative standards must be justified as the only alternative and approved by the Oregon Transportation Commission. Separate turn-lane channelization at the side street approaches of an unsignalized intersection is one cost effective improvement that can be made;

however, this will not improve the side street left turn performance, which is usually the problem at unsignalized intersections. Also, an unsignalized intersection is unlikely to meet the Manual of Uniform Traffic Control Devices (MUTCD) signal warrants unless the level of service is above 0.85.

The adopted level-of-service standard for state highways is determined by the Oregon Highway Plan (OHP). The adopted level-of-service standard for city streets should reflect community values and views of acceptable delays and congestion levels. However, these values must be balanced by the community's ability to fund the needed improvements defined by the level of service standard. If the level of service standard is set too high, then it will be too costly to maintain the level of service standard. If the level of service standard is set too low, then substantial congestion problems result.

All of the options developed for the following intersections are based on the idea that US 101 will remain as is and not developed as a one-way couplet. However, the one-way couplet proposed for US 101 should improve the unsignalized intersections of US 101 and Arnold Lane, Pacific Ave., and Alder Street.

The traffic engineering software package UNSIG was used to analyze the level of service for unsignalized intersections. UNSIG calculates level-of-service at unsignalized intersections based on the 1985 Highway Capacity Manual. This methodology relates level-of-service to reserve, or unused, roadway capacity (measured in passenger cars per hour). Reserve capacity is evaluated for all vehicles entering or crossing the major roadway traffic flow from side streets, as well as those making left turns on the major roadway. Each of these intersections was analyzed for traffic signal warrant using the MUTCD. For communities with a population under 10,000 the minimum volume to warrant a signal is 70 percent of that required in the MUTCD.

Signalization is not always the best improvement for unsignalized intersections that are operating at sub-standard levels-of-service. Other alternatives could be considered including channelization, lane use controls, sight distance improvements, and multiway STOP control.

US 101 and Carpenterville Road and Dawson Road – US 101 is intersected by Dawson Road on the west and Carpenterville Road on the east. This is a four-leg intersection with a STOP control on Dawson and Carpenterville Roads. This intersection is located just north of downtown. Recent 2002 traffic counts and analysis at the US 101/Carpenterville Road intersection shows that the intersection is already operating below ODOT's V/C standard of 0.85.

During the AM period the westbound approach on Carpenterville Road is projected to operate at a V/C ratio of more than 1.0 and in the PM both the eastbound and westbound will operate at a V/C of more than 1.0 Currently at this intersection, the side streets come into the intersection at angles and one major improvement would be to adjust the alignment to a right-angle intersection. This would improve the sight distance and the operation of the intersection.

Second, this intersection could benefit from a traffic signal. Under the guidelines of the MUTCD for a traffic signal, the intersection meets Warrant 1 for Minimum Vehicular Volume, and Warrant 2 for Interruption of Continuous Traffic. This intersection meets the 70 percent criteria on the side streets required in the MUTCD guidelines.

By adding a traffic signal, this intersection would operate at V/C 0.89 with the existing lane configurations in the year 2017. The addition of a signal and additional turn lanes on the local streets would only slightly improve the performance of the intersection (V/C=0.88). For this intersection to operate at an acceptable level-of-service, additional through/right-turn lanes would have to be added in both directions on US 101, in which case the intersection would operate at a V/C of 0.76.

A basic traffic signal is estimated to cost approximately $150,000 and additional lanes on US 101 would cost as much as $200,000 each. Exclusive turning lanes on Dawson Road and Carpenterville Road would cost about $160,000 for each. To improve this intersection to an acceptable level-of-service, the improvements would include widening the highway and a new traffic signal. This improvement would cost approximately $550,000. No cost estimate has been determined for the realignment of the intersection.

As an unsignalized intersection the vehicles traveling along US 101 will experience V/C ratios no higher than 0.19, with little or no delays. A signal at this intersection would cause the vehicles on US 101 to experience greater delay and V/C would drop to between 0.40 and 0.63. While the signal would improve the side streets level-of-service, it would deteriorate the level-of-service along US 101. By adding a signal, safety becomes an issue as well. The speed limit along this portion of the highway is 55 mph and this intersection is located over two miles away from any other signalized intersections. Based on current land use and the likely deterioration of operation and safety, a signal is not recommended for this intersection.

US 101/Chetco Avenue and Arnold Lane – Arnold Lane intersections US 101 from the west at a "T" intersection. At the intersection of US 101 and Arnold Lane, the eastbound approach is predicted to operate at a V/C of 1.07 in the year 2017. The other movements of the intersection will operate at acceptable V/C. The intersection as a whole would operate at a V/C of 0.56 if signalized. Further, the intersection meets the required warrant for Peak Hour Volumes according to the MUTCD (Warrant 11). The side street volumes at this intersection meet the 70 percent requirement for the Warrant 11 for the Peak Hour Traffic Volume for a traffic signal. However, other signal warrants are not met and would have to be reached before a signal could be installed. Therefore, while this intersection could be improved to meet level-of-standards, it does not meet signal warrants and cannot be signalized at this time. The city should continue to work with ODOT on monitoring signal warrants to determine if this is an acceptable solution. In any case, a signal will have to be approved by the State Traffic Engineer before being allowed. Cost would be approximately $150.00.

Another option would be to widen Arnold Lane so that the left turning vehicles and the right turning vehicles have exclusive lanes. Widening of Arnold Lane would improve the right turn movement on the eastbound approach to a LOS C, but the left-turn movement would remain at LOS F. The other movements at the intersection operate at LOS C or better in both the existing configuration and with the widening of Arnold Lane.

The volumes along Arnold Lane are not very high compared to the high volumes on US 101. It is the high volumes on US 101 that impede the traffic from the side streets. The cost for the right-turn lane would be approximately $160,000 just for the additional lane. The level-of-service for the side street approaches would improve for the right-turning vehicles, but there would be no improvement to the left turning or through moving vehicles. The costs outweigh the benefits. Any additional lanes are not going to prove to be cost-effective. Improving the mobility along US 101 so that the side streets have more opportunities to access or cross the highway should be developed.

US 101/Chetco Avenue and Pacific Avenue – US 101 and Pacific Avenue is a four-leg intersection with a STOP control on the eastbound and westbound legs of Pacific Avenue. At the intersection of US 101 and Pacific Avenue, the eastbound and westbound approaches on Pacific Avenue are predicted to operate at a V/C ratio greater than 1.0 in the year 2017. The intersection meets Warrant 2 for Interruption of Continuous Traffic of the MUTCD. The side street volumes at this intersection meet the 70 percent criteria of that requirement for the Peak Hour Traffic Volume Warrant. Other required signal warrants are not met.

With a traffic signal, the intersection would operate at a V/C of 0.63. This intersection is located approximately 742 feet north of the signalized intersection of US 101 and Center Street and 797 feet south of the signalized intersection of US 101 and 5th Street. The spacing of the intersections does not meet signal spacing standards of 1,300 feet. While signals may be spaced more closely in some cases, the distance between Pacific and Mill to the north would preclude deviation at this location. In addition, while a signal at this location would improve performance for turns from the local street, capacity on the highway would worsen. The cost for a new signal at this intersection would be approximately $150,000.

Simply adding a left-turn lane on US 101 would improve the mobility of the traffic on the mainline, however, the eastbound and westbound approaches would still operate at a sub-standard level-of-service. Possible improvements to the side streets are to construct an exclusive left-turn lane on eastbound Pacific Avenue and an exclusive right-turn lane on westbound Pacific Avenue. However, this would not improve the operation of the side streets. This intersection is too close to other signalized intersections to recommend that a signal be installed and the additional lanes will not improve the operation of the intersection.

US 101/Chetco Avenue and Fern Avenue – The eastbound and westbound approaches on Fern Avenue are projected to operate at V/C greater than 1.2 by the year 2017. The intersection does not meet any of the Traffic Signal Warrants in the MUTCD. The eastbound and westbound approaches experience poor levels-of-service because the high volumes on US 101 restrict access from the side streets, whose volumes are relatively low. As mentioned earlier, there are other options to improving the intersections other than signalization. In general, the highest volumes on Fern Avenue are right-turning vehicles, therefore an exclusive right-turn lane may improve the operation of the intersection.

An exclusive right-turn only lane on the east and westbound approaches would operate at LOS A in both the AM and PM peak period. This means the right-turning vehicles would experience very short delays. During the AM peak period the eastbound and westbound shared through and left-turn lane would still fall below acceptable standards and would continue experience long delays.

Fern Avenue does not have very high volumes and the problem results from the high volumes along US 101. The cost for the right-turn lane would cost approximately $160,000 just for the additional lane. The level-of-service for the side street approaches would improve for the right-turning vehicles, but there would be no improvement to the left-turning or through moving vehicles. The costs outweigh the benefits. Any additional lanes are not going to prove to be cost-effective. Improving the mobility along US 101 so that the side streets have more opportunities to access or cross the highway should be developed.

US 101/Chetco Avenue and Alder Street – Alder Street intersects US 101 at a "T" intersection from the west side of US 101. The intersection consists of two travel lanes in each direction along US 101 with one shared right-turn and through lane and one shared left-turn and through lane. There are two turning lanes on Alder, an exclusive right turn lane and an exclusive left-turn lane. The Alder Street leg of this intersection is projected to operate at a V/C greater than 1.2 by 2017. The volumes at this intersection do not meet Warrant 1, or Warrant 2 for Traffic Signal Installation in the MUTCD. Improvement to the intersection will be needed to reduce delay.

Another option is to construct an exclusive left-turn lane along northbound US 101. This would allow the through traffic to proceed through the intersection without interference from the left turning vehicles. However, this change will not significantly improve the overall operation of the intersection. A traffic signal would cost approximately $120,000 and an additional lane would cost about $160,000 per lane. These improvements are expensive and the resulted improvement will not be significant.

Recommendation: No additional signals or other improvements are recommended along US 101 at this time. The proposed one-way couplet on US 101 would improve operations at all of these intersections, both on the highway and for turns from the local street. However, the environmental analysis planned for the downtown area will examine traffic operations and determine the appropriate improvements needed for these intersections.

Option 9. Improve the signalized intersections which are projected to operate at sub-standard levels-of-service

Overview: The signalized intersections that were analyzed and are projected to operate at LOS E or F in the 2017 condition include:

- US 101-Oak Street
- US 101-Chetco Avenue/5th Street

To define the future transportation deficiencies, performance on state highways is defined in the Oregon Highway Plan and is LOS D for city streets. However as noted earlier, a community must balance the level-of-service against the ability to fund the needed improvements defined by the level of service standard.

Consideration of changes to the signalized intersections was completed prior to the adoption of the V/C ratio performance standard and is discussed in terms of LOS letters. ODOT has reviewed the analysis and concurs with the recommendation that no changes be made to these intersections. However, the use of LOS letters in the description below was allowed to remain until the next periodic review update of the TSP at which time they will be updated to reflect V/C ratios rather than LOS letters.

In the future, these intersections may be reanalyzed in response to development or other changes to traffic conditions. Specifically, as the proposed couplet is developed through the downtown, impacts to these intersections will have to be examined. At that time, the city and ODOT will cooperate in modeling potential alternatives. In all cases, subsequent signal warrant analysis must consider and be reported in terms of V/C ratios rather than LOS letters. Further, before any changes can be recommended to the signals, the proposal must be reviewed and approved by the State Traffic Engineer.

The traffic engineering software package SIGCAP was used to analyze signalized intersection level-of-service. SIGCAP correlates level-of-service with saturation values. The saturation value is a measure of congestion levels, where the higher the saturation value the higher the level of congestion.

?US 101 and 5th Street. This is a four-legged intersection located in downtown Brookings. There are two travel lanes in each direction on US 101 and one travel lane in each direction along 5th Street. At the intersection, there is a shared right-turn and through lane and an exclusive left-turn lane on southbound and northbound US 101. On 5th Street, there is a shared right and through and exclusive left-turn lanes in both the westbound and eastbound directions.

This intersection is projected to operate at LOS B in the AM and LOS D or LOS E in the PM by the year 2017. The eastbound and westbound left-turns would operate at LOS D or E causing substantial delay for vehicles turning left onto US 101 during the PM peak period. In the northbound and southbound direction all movements are projected to operate at LOS D or E. There are several options to improve the level-of-service for an intersection such as variations in the phasing or cycle lengths or adding turning lanes for high volume movements.

On the eastbound approach the highest volume movement is the right-turn onto southbound US 101. In this instance a right-turn only lane could be implemented. During the PM peak period, if an exclusive

right-turn only lane was added to the eastbound approach on 5th Street, the intersection would operate at LOS D and the northbound and southbound would operate at LOS D or better. All left turning movements would operate at LOS D and the eastbound and westbound through and right would operate at LOS B or better.

Improvements along US 101 are most desirable and could benefit the operation of the intersection of a whole. If exclusive left-turns are constructed the level-of-service would operate at LOS D, during the PM peak period. The southbound exclusive left would operate at LOS D while the other southbound movements operate at LOS A. The northbound exclusive left would operate at LOS C while the other northbound movements operate at LOS B.

Although these different options resulted in an improvement in level-of-service for the side street approaches, the improvement was not that significant. Adding an additional lane would cost approximately $160,000 per lane. For two left-turn lanes along US 101 would cost about $320,000 and vehicles at the intersection would still experience the same amount of delay, with the exception of the eastbound approach. An analysis of the signal timing and phasing should be considered. Optimizing the phasing and timing of a traffic signal could improve the intersection level-of-service and the level-of-service on the approaches. The US 101 one-way couplet would improve the signalized and unsignalized intersections along the highway.

US 101 and Oak Street. This is a four-legged intersection located in the downtown area of Brookings. There are two travel lanes in each direction on US 101 and one travel lane in each direction on Oak Street. At the intersection, there is a shared right-turn and through lane and a shared left-turn and through lane on southbound and northbound US 101. On Oak Street, there is a shared right, through and left in both the westbound and eastbound direction.

This intersection is projected to operate at LOS C in the AM and LOS F in the PM by the year 2017. During, the PM peak period, however, the westbound approach is projected to operate at LOS E, while all other approaches operate at LOS F. This means all vehicles at this intersection will experience an average of 60 seconds of delay during the PM peak period. There are several options that may improve the level-of-service for an intersection such as variations in the phasing or cycle lengths or adding turning lanes for high volume movements.

During the PM peak period, the intersection would operate at LOS D during a two phase 60 second cycle. The highest volumes are on the through movements along US 101. When the through volumes are high, the gaps for left-turning vehicles decrease causing congestion on the highway. If left-turn lanes were constructed on US 101 the intersection would operate at LOS D and all approaches would operate at LOS D or better. If widening on US 101 is not an option, additional left-turn lanes on Oak Street would improve the intersection level-of-service. With this configuration the intersection could operate at LOS D.

An analysis of the signal timing and phasing should be considered. Optimizing the phasing and timing of a traffic signal could improve the intersection level-of-service and the level-of-service on the approaches. This option is the only one that resulted in a significant improvement in the level-of-service. The US 101 one-way couplet would also improve the signalized and unsignalized intersections along the highway. Adding an additional lane would cost approximately $160,000 per lane. For two left-turn lanes on US 101 would cost about $320,000 and vehicles at the intersection would still experience the same amount of delay, with the exception of the eastbound approach.

Recommendation: Changing the phasing and the timing of the signal would be the most cost-effective improvement for both intersections. However, before any changes are made to these intersections, further investigation of the proposed couplet will have to be made to model potential impacts. This would have

to joint effort between the City of Brookings and ODOT to coordinate signal timings with the other signalized intersections on US 101.

Option 10. Improve the arterial and collector street segments which are projected to operate at sub-standard levels-of service

Overview: Through traffic on US 101 is required to operate at a V/C ratio of 0.80 or better through Brookings. The city has established LOS D as the acceptable standard for city streets. The following arterial and collector streets are projected to operate below acceptable performance standards in 2017:

- US 101 from north of Carpenterville Road to Ransom Ave.
- US 101 from Ransom Ave. to south of Alder Street
- Pioneer Road east of Pacific Avenue
- Benham Lane

US 101 from north of Carpenterville Road to Ransom Ave. – Research has shown that there is a direct correlation between the number of access points and collision rates. Access management can improve the safety and the efficiency of the roadway. Currently, there are few access points through this segment. Future consideration of access will help in slowing degradation of capacity and safety. Constructing a raised median and prohibiting left turns would improve safety as well as increase mobility along the roadway, although, again the number of access points is small and therefore this alteration would have only a small improvement in operations. Other measures such as widening shoulders or adding more lanes may be necessary to mitigate congestion.

Development proposed for the area north of Carpenterville Road will likely negatively impact this segment of highway, particularly in terms of congestion. At full buildout of the UGB, widening of the highway may be necessary. As discussed above, the TSP analysis could not accurately project all the impacts of development and a more targeted traffic study will be required in conjunction with any development that will significantly impact the highway and/or local streets. Such a study will investigate the impacts to the existing road system, as well mitigation measures such as limiting or phasing development, providing turn lanes, widening the highway; and providing alternative routes such as local street connections between the development and the downtown.

US 101 from Ransom Ave. to south of Alder Street – This segment of roadway is predicted to operate at a V/C ratio of greater than 1.2 by the year 2017. The sub-standard level-of-service is a primarily a result of US 101 functioning as the only arterial in the study area. US 101 serves as the city's Main Street. If allowed most future traffic from new development will use US 101 for both longer regional trips and shorter local trips. The proposed one-way couplet, as described on US 101 will improve the operation of this segment as well as improve many of the intersections along the roadway.

Pioneer Road north of Pacific Avenue – Pioneer Road is currently two travel lanes, one in each direction, approximately 22 feet in width and is identified as a collector.

Pioneer Road is projected to carry as much as 5,600 vehicles daily and operate at LOS E by the year 2017. The capacity for this roadway is identified as an average of 6,000 vehicles daily, and by the 2017 it will almost reach capacity. With a LOS E, vehicles traveling on Pioneer Road will experience very long delays and substantial congestion. This condition would primarily be caused by single family infill development north of Ransom Avenue and additional future trips generated by the schools.

It is important that the transportation facilities are able to accommodate future growth. The additional traffic caused by future development may warrant an additional travel lane in each direction or perhaps a

third lane to allow refuge for left turning vehicles. Where left-turn volumes are high, a three-lane cross section can function better than a four-lane cross section because turning vehicles do not interfere with the flow of through movements. In addition, a three-lane cross section provides more right-of-way for bicycle lanes, parking, and sidewalk than a four-lane cross section.

Benham Lane east of US 101 –Benham Lane is a County road within the UGB and currently has two travel lanes, one in each direction, and is approximately 24 feet in width.

East Benham Lane is projected to carry an average of 9,000 vehicles daily exceeding its capacity of 6,000 vehicles a day. This segment is predicted to operate at LOS F by the year 2017, primarily due to the additional trips generated by the Harbor Hills, Westbrook/Reservation Ranch, and North Harbor area developments. East Benham Lane is one of the logical access points to these future developments. However, East Benham Lane will not be able to accommodate the projected traffic.

As future development is constructed, the travel demand on the roadways will increase. Additional lanes will be needed to accommodate the additional traffic in the future or alternative access points will be required. Benham and any other connections to the developments should be built to city collector standards, allowing for modifications due to topography. Depending upon the traffic patterns of the roadway and the future land uses a center turn lane is also an option to consider. A three-lane cross section can function better than a four-lane cross section when left turn volumes are high because turning vehicles do not interfere with the through traffic. This allows more right-of-way for bicycle lanes, and sidewalk as compared to a four-lane cross section.

An alternative that should be considered in conjunction with a traffic impact study for the area is local streets that parallel US 101 which carry some of the traffic load away form Benham Lane and the intersection at US 101. This alternative is not recommended at this time, but the city and county will require consideration of this alternative in conjunction with future development that may impact Benham Lane.

Cost Estimate: ODOT's current cost estimates for the US 101 couplet are approximately $13,000,000. Pioneer Road is approximately 2,000 feet in length from Pacific Avenue to Hassett Street. For a three-lane cross section along Pioneer Road at $200 a linear foot, the cost would be about $400,000. East Benham Lane is approximately 1,000 feet in length and the cost would about $200,000. No estimate is available at this time for improvements required to mitigate development east of US 101 north of Carpenterville Road or additional connections in conjunction with development near East Benham Lane.

Recommendation: Congestion on the segment of US 101 from north of Carpenterville Rd. to Arnold Lane will not be improved by the couplet. The city will require the completion of the traffic impact study to determine appropriate safety and capacity improvements needed in conjunction with proposed development.

The US 101 Couplet is one option being considered through an environmental assessment of the segment of US 101 between Arnold Lane and Alder Street. Previous study has shown that the couplet would improve the mobility of the vehicles traveling along US 101 and improve the signalized and unsignalized intersections along the highway. However, the results of the EA will determine the appropriate level of improvement needed for the downtown area. See Option 2 discussed above.

Pioneer Road should be upgraded to a three-lane cross section would improve the function of the roadway to accommodate the future growth. A three-lane cross section would allow vehicles to turn without interfering with the through moving vehicles.

Benham Lane is projected to experience an increase in traffic by the year 2017. The existing roadway is not designed to accommodate such a substantial increase in travel demand. Improvements to the roadway will be needed to accommodate future growth. Additional travel lanes are worth considering, although the developers of properties in the area have proposed other connections to US 101. At the time of TSP adoption, the impact of these developments was under study. The city will require completion of this study prior to approval of any master plan or zone changes for the developments. This study should include potential development on both sides of the highway and include participation by all developers currently proposing activity that will affect the road network in this area.

Option 11. Improve the intersection of Lower Harbor Road and Shopping Center Road at the entrance to the Port of Brookings

Overview: Lower Harbor Road and Shopping Center Road are classified as collectors by Curry County and City of Brookings, respectively. Lower Harbor Road connects the Port of Brookings/Harbor with US 101. Shopping Center Road lies parallel to US 101 between Lower Harbor Road and Hoffeldt Lane. The two roads intersect at a "T" intersection, with the entrance to the port located directly across from Shopping Center Road. The intersection is two-way STOP controlled, with Lower Harbor Road being the through street.

At various times, community concern was raised in favor or changing the existing two-way STOP control to signalized control. ODOT Region 3 analyzed this intersection to determine whether the intersection met the warrants for signalization; it did not. The intersection also did not meet the warrants for all-way STOP control.

The cost to install a traffic signal at a typical intersection is over $100,000. Traffic control signals should not be installed unless one or more of the signal warrants in the Manual on Uniform Traffic Control Devices is met. Warrants for traffic signals are based on minimum traffic and pedestrian volumes, hours of delay, need for gaps in continuos traffic and accident history. In addition to meeting one or more warrants for a signal, installation of a traffic signal must improve the overall safety and/or operation of the intersection. When a traffic signal is not warranted, STOP sign control is an appropriate traffic control measure. As stated above, this intersection did not meet the warrants for a traffic control signal.

All-way STOP control is ordinarily used only where the volume of traffic on the intersecting roads is approximately equal. All-way STOP control is warranted where traffic signals are warranted and the all-way STOP is an interim measure that can be installed quickly to control traffic while arrangements are being made for the signal installation, and where accident history and traffic volume warrants are met. As stated above, this intersection did not meet the warrants for all-way STOP control.

Impacts: If a traffic signal or all-way STOP control is installed at an intersection with low volumes on the minor street, they cause unnecessary delays for vehicles on the major street. Safety can be compromised if an all-way stop is installed at an intersection where traffic volumes on the minor street do not warrant stopping the major street, because if drivers on the major street become accustomed to not seeing traffic approaching on the minor street they may only come to a "rolling stop" or ignore the STOP sign altogether.

Recommendation: It is recommended that the existing two-way stop control be maintained at the intersection of Lower Harbor Road and Shopping Center Road. The traffic volumes and accident history do not warrant the high cost of installing a traffic signal or even changing the control to an all-way STOP. If a study of conditions at Benham Lane and the Port area also include this location it may show other improvements that are warranted. If so, results from that study will take precedence over the short-term improvements discussed here.

Option 12. Construct a Center Turn Lane on US 101 in Harbor

Overview: Property owners along US 101 south of Harbor have identified a need for a center turn lane on US 101 from Harbor to the California State Line. They have expressed a safety concern for vehicles turning left into their properties. The property owners recently circulated a petition signed by more than 300 residents of Curry County. The petition requests that ODOT extend the center turn lane on US 101 in Harbor from its present terminus south of Pedroli Lane to the Oregon-California State Line. A copy of the petition is included in Appendix D.

Impacts: Center turn lanes primarily address two traffic issues: traffic level of service and safety. When left turns are made from a four-lane highway, vehicles stopped to make turns block the left lane, causing through-moving vehicles behind them to stop also, or change lanes to pass. This can cause delays for through vehicles, reducing their average speeds and corresponding levels of service. Center turn lanes can improve safety by reducing the chances of rear-end accidents which result when vehicles stop in the through travel lanes and are hit by the vehicles behind them.

Center turn lanes do not necessarily reduce the number of accidents through a highway segment, but often change the type of accidents that are experienced. 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 may cause unsafe conditions as vehicles on either the main roadway or a side street may not be expecting the lane change, which could result in an accident. At the same time, the addition of a continuous turn lane may increase the number of head-on collisions as cars waiting to turn left are struck by on-coming vehicles. This situation is made worse when drivers use the turn lane as an acceleration or deceleration lane and do not see vehicles facing them in the same lane.

A three-lane cross section provides two through travel lanes. Typical two-lane highways in Oregon can accommodate average daily traffic volumes of 10,000 vehicles per day (vpd), and are not considered for widening to four lanes until traffic volumes exceed 10,000 vpd. Existing traffic volumes on this segment of highway range between 7,000 and 10,000 vpd and are expected to increase to 12,000 to 32,000 vpd by the end of the 20-year planning period. More specific study will be required before the segment can be stripped for either 3 or 4 lanes, including consideration of closing or consolidating accesses to reduce the number of turning conflicts. If this section of highway is restriped to a three-lane cross section, traffic operations should be monitored to determine whether the highway still operates at an acceptable level of service.

Restriping a four-lane highway to a three-lane highway constitutes a very low cost improvement and it does not change the physical roadway width, therefore, it may be repainted as a four-lane section relatively cheaply. However, making significant changes to the highway such as adding or removing lanes often meets with opposition from the traveling public

In the case of US 101 between Harbor and California, it is not a three-lane section, but a five-lane section which the community desires. The highway currently has a ten-foot asphalt median and can be restriped to include a 14-foot center turn lane with minimal pavement widening along the edges. A five-lane cross section would both increase the capacity of the highway, and the safety as described above.

Recommendation: As stated above, ODOT has analyzed traffic conditions and the State Traffic Engineer has opposed the request for a center turn lane. A review of turning volumes and accident reports has not indicated a current problem with left turns. In addition, providing a center turn lane on this highway segment is contrary to current design and operation policies. As a result, a center turn lane is not recommended for this highway segment at this time, although continued discussion with ODOT is recommended. Any such change will have to be approved by the State Traffic Engineer before being implemented.

Option 13. Improved East-West Connection between the South Coast and I-5

Overview: An east-west arterial highway from US 101 to I-5 in the county is needed to reduce the relative isolation of the area from the rest of the state. This was identified as a policy in the Curry County Comprehensive Plan and as a goal in the Oregon Coast Highway Corridor Master Plan.

The City of Brookings is less isolated than the Cities of Port Orford and Gold Beach, and the northern part of the County due to its proximity to US 199. US 199 intersects US 101 in California, approximately 17 miles south of the Oregon-California State Line (approximately 22 miles south of Brookings). US 199 crosses the coastal range in California, reenters Oregon approximately 40 miles northeast of its connection to US 101, and continues approximately 45 miles north to I-5 in Grants Pass. Using California State Highway 197 between US 101 and US 199 reduces the trip by four miles.

ODOT prepared a study in 1974 for an improved east-west corridor between US 101 and I-5. ODOT studied 14 different alignments and identified one alignment, the Shasta Costa corridor, as the preferred alignment. The study determined that the cost of such a project (estimated at $41 to $95 million in 1974 dollars) would far outweigh any economic benefits to the area.

The existing road that connects US 101 in Gold Beach to I-5 just north of Grants Pass consists of a paved county road from the junction with Highway 101 and Lobster Creek Campground, approximately 10 miles. At that point, the paved road continues up river as Forest Service Road 33, approximately 19 miles to the junction with Forest Service Road 23 is a single lane, paved road for approximately 22.5 miles before entering Bureau of Land Management (BLM) lands. The road continues as an extra wide paved road for approximately 12.5 miles to Galice and County Road 2400. From there it is approximately 15 miles to I-5. The length is over 70 miles. Improving this road would require the cooperation of at least four jurisdictions: Curry County, Josephine County, US Forest Service, and BLM. The State of Oregon would also probably be involved.

None of these jurisdictions has the ability to fund a major improvement to this road (improve the road to state highway standards). Congress has cut the Forest Service's operating and maintenance budget every year since 1990 and the Forest Service, which itself is not a road department, has been constructing few new roads on Forest Service land. At the State level, the governor recently issued a moratorium on all new state highway projects, except for preservation projects on the existing state highway system. The cost to improve this road is far in excess of the County Road Department's budget.

A second alternative was identified that consisted of t raveling one-way utilizing Forest Service Road 23, Bear Camp and traveling the opposite direction utilizing Forest Service Road 2308, Snout Creek. Both of the roads are single lane with turnouts and could stay that way, however one is currently paved and the other is aggregate surfaced. This alternative was not considered viable due to factors including current usage, which includes recreational, commercial, administrative and general public travel and the need to pave and maintain an additional 20 mils of road (Forest Service Road 2308).

The Transportation Advisory Committee (TAC) agreed that constructing a paved two-lane highway in the corridor is still infeasible in the 20-year planning period. The TAC recommended that the existing road, some of which is a one-lane gravel road, remain as is, but the road should stay open year-round for emergency access.

Improving maintenance on the one-lane gravel Forest Service Road through Agness is less important to the residents of Brookings than other residents of Curry County, because the two-lane paved Highways 197 and 199 already provide a more viable east-west connection. However, members of the Brookings TAC identified the need for better maintenance on US 199. Responsibility for maintenance on US 199 lies with the states of California and Oregon, for their respective sections. Members of the Brookings

TAC indicated that the California Transportation Department (CalTrans) is currently preparing a corridor study on US 199. It was suggested that ODOT cooperate with CalTrans to prepare a bi-state corridor study for US 199 between US 101 and I-5.

Cost Estimate: No cost estimate was prepared for this option. The recommendation is for a bi-state corridor study of the US 199 corridor. The corridor study will identify specific needs for the highway as well as capital improvements and maintenance improvements to address those needs. Cost estimates should be prepared as part of the corridor study, when specific projects are recommended.

Recommendation: The recommendation for an improved east-west connection between US 101 and I-5 which serves the Brookings area is an improved US 199 corridor (which could include California State Highway 197). Jurisdiction over US 199 lies with the states of California and Oregon. CalTrans is already preparing a corridor study for the section of the highway located in California. A study of the entire corridor between US 101 and I-5 should be a cooperative effort between ODOT and CalTrans. Oregon Revised Statute (ORS) Chapter 197 provides for State Agency Coordination Agreements whereby state agencies agree to work within the confines of local jurisdictions' Comprehensive Land Use Plans. The program is administered by the Oregon Department of Land Conservation and Development (DLCD). To begin the process, ODOT should enter into an intergovernmental agreement to work together with CalTrans on the US 199 corridor study.

Option 14. Develop an alternative route to US 101 for when the highway is closed

Overview: The need for an alternative north-south route to US 101 was identified because mud and rock slides on US 101 have closed the highway recently (at Humbug Mountain, Arizona Beach, and Hooskanaten), at times isolating the Cities of Port Orford, Gold Beach and Brookings from the rest of the county.

Several State, County and Forest Service roads, including Elk River Road, Euchre Creek Road, Meyers Creek Road, Cape View Road and Carpenterville Road were identified as possible alternatives.

Elk River Road – Elk River Road begins at US 101 approximately three miles north of Port Orford as a 2-lane, paved County Road for seven miles to the Elk River Fish Hatchery and the National Forest Boundary. From there, the road becomes a Forest Service Road, maintained at Maintenance Level 4 (moderate speed, moderate degree of user comfort) to milepost 11.3. Elk River Road and Euchre Creek Road, connected by Forest Service Road 5502, provide an alternative route to US 101, bypassing Humbug Mountain State Park and Arizona Beach. The paved section of the road is approximately 24 feet wide and can accommodate trucks.

Euchre Creek Road – Euchre Creek Road begins at US 101 approximately 10 miles north of Gold Beach as a two-lane, paved County/Forest Service Road, maintained at Maintenance Level 4 for the first two miles. From there, the road is maintained at Maintenance Level 3 (low speed, single lane) approximately 12 miles to Forest Service Road 5502. Euchre Creek Road and Elk River Road, connected by Forest Service Road 5502, provide an alternative route to US 101, bypassing Humbug Mountain State Park and Arizona Beach. The paved section of the road is approximately 20 to 22 feet wide.

Meyers Creek Road – Meyers Creek Road is a two2-lane, paved loop road which was part of the Old Coast Highway. The road is approximately three miles long and it parallels US 101. Both ends of this road tie in to US 101 in the vicinity of Cape Sebastion State Park.

Cape View Road – Cape View Road is a two-lane, paved road which parallels US 101. The road begins at the bridge over the Pistol River, extends approximately two miles north and connects with US 101. South of the bridge over the Pistol River, Cape View Road connects with Carpenterville Road. Cape

View Road and Carpenterville Road provide a parallel, alternative route to US 101, bypassing the Hooskanaten slide area.

Carpenterville Road - Carpenterville Road is a 2-lane, paved road which was part of the Old Coast Highway. The road is still under state jurisdiction, although it is considered a frontage road to US 101, and is designated a District-level highway. The road is approximately 24 miles long and it parallels US 101. At the south end, Carpenterville Road connects with US 101 just north of the City of Brookings. At the north end, it connects with Cape View Road at the bridge over the Pistol River. Carpenterville Road and Cape View Road provide a parallel, alternative route to US 101, bypassing the Hooskanaten slide area.

There are several other two-lane, paved County Roads which parallel US 101 and can be used as alternative routes to the highway: Ophir Road, North Bank Rogue River Road and Edson Creek Road, and North Bank Rogue River Road and Squaw Valley Road. These roads are shown on Figure 6-9. Ophir Road lies adjacent to, and parallel to, US 101 from Ophir to Geisel Monument State Park, five miles to the south. In all likelihood, a slide which closed US 101 in this area would also close Ophir Road; however, Ophir Road could be used as a detour during minor construction on the highway. North Bank Rogue River Road and Edson Creek Road provide a viable alternative to a five-mile section of US 101 just north of Gold Beach. North Bank Rogue River Road and Squaw Valley Road could be used to bypass a 10-mile segment of US 101 just north of Gold Beach. These roads do not need improvements to be used as alternatives to the highway.

Impacts: When US 101 is closed due to a mud or rock slide, travel restrictions result in economic impacts to the Cities of Port Orford, Gold Beach and Brookings, as well as the County itself. When the highway is closed, and trucks are prohibited from using the parallel, alternative routes, agricultural products grown in Curry County are delayed in reaching their market destinations. At the same time, other goods from outside the county are delayed in reaching the local consumers. In addition, there is also an impact to passenger car trips. Some trips, such as work trips, will be made on long, circuitous routes, sometimes on one-lane, poorly maintained roads. Travel on such roads increases travel time, fuel consumption and the possibility of having an accident. Many leisure trips may not be made at all, thus impacting businesses that rely on tourist dollars.

A system of good, parallel, alternative routes to US 101 would address the impacts realized when the highway is closed. Developing this system comes at a cost. Some of the roads identified as possible alternatives to the highway require substantial capital improvements such as widening and paving to make them viable, safe alternatives. Others may require only a higher level of maintenance such as grading and snow removal, but this too comes at a cost. The following paragraphs describe the improvements needed on the roads that were identified as possible alternatives.

Elk River Road and Euchre Creek Road - Elk River Road, in combination with Euchre Creek Road and Forest Service Road 5502 provide an alternative route to US 101, bypassing Humbug Mountain State Park and Arizona Beach. Approximately 18 miles of this route (six miles on Road 5502 and 12 miles on Euchre Creek Road) are maintained at Forest Service Maintenance Level 3. Roads in this maintenance level are typically low speed, single lane with turnouts and spot surfacing. User comfort and convenience are not considered priorities. Traffic management strategies are either "encourage" or "accept." "Discourage" or "prohibit" strategies may be employed for certain classes of vehicles or users. To make this route a viable alternative to US 101 during emergencies, it is recommended that these roads be maintained at Maintenance Level 4. At Level 4, most roads are double lane and aggregate surfaced. Some roads may be paved and/or dust abated. The most appropriate traffic management strategy is "encourage."

Changing a Forest Service Road's Maintenance Level requires road reconstruction. Road reconstruction consists of the investment in construction activities that result in the betterment (raised traffic service level, safety, or operating efficiency), restoration (rebuilding a road to its approved traffic service level), or in the realignment (new location of an existing road or portions thereof) of a road. The process begins with the reviewing of the Road Management Objectives that define the intended purpose of an individual road based on design, operation and maintenance criteria.

It was estimated that a one-time capital cost of $100,000 per mile would be required to bring these roads from Maintenance Level 3 to Level 4. To improve 18 miles of Euchre Creek Road and Road 5502 would cost $1.8 million. After that, annual maintenance costs would increase as well. Average annual maintenance costs in western Curry County are $400 per mile for Level 3 roads and $1,000 per mile for Level 4 roads. The difference between these two, $600 per mile, represents the increase in maintenance costs that would be realized each year. The average annual cost to maintain an additional 18 miles of Forest Service roads at the higher maintenance level would be $10,800.

Meyers Creek Road – Meyers Creek Road was identified as a viable, parallel alternative route to US 101, although it does not bypass a known slide area on the highway. Nonetheless, this road does not need improvements to be used as an alternative to the highway and could be used as a detour during minor construction on the parallel three-mile section of US 101.

Cape View Road – Cape View Road was also identified as a viable, parallel alternative route to US 101, although it does not bypass a known slide area on the highway. Nonetheless, this road does not need improvements to be used as an alternative to the highway and could be used as a detour during minor construction on the parallel four mile section of US 101.

Carpenterville Road – According to the local community, mud and rock slides at Hooskanaten close US 101 for two to three weeks approximately every 15 to 20 years. The last time a slide occurred here, Carpenterville Road remained open as a way to bypass the slide area for passenger car traffic; however, trucks were prohibited from using the road. Normally trucks are not prohibited from using Carpenterville Road, but because US 101 provides a much faster and safer route for trucks, through trucks do not use the road. When US 101 is open, only the occasional logging truck accessing adjacent forest land uses Carpenterville Road. The pavement width is only about 20 feet, and the road has some very tight, narrow curves. The substandard road conditions do not pose a problem under normal conditions, when the road only serves local land access; however, a significant safety problem arises when the road is used as a detour for US 101. With the additional passenger car traffic during the highway closure, the road was deemed unsafe for truck traffic, and trucks were prohibited from using the road.

The truck restriction on Carpenterville Road caused an undue economic hardship on the City of Brookings. A local lumber company was under contract to deliver wood products to a ship in Coos Bay. On US 101, the trip between Brookings and Coos Bay is approximately 100 miles. When US 101 was closed by the Hooskanaten slide, and trucks were prohibited from Carpenterville Road, the only alternative for the lumber trucks was to divert south on US 101 to California, travel north back into Oregon on US 199 to Grants Pass, travel north on I-5 to Roseburg, and travel west on OR 42 to reach US 101 south of Coos Bay, a 250-mile detour.

During the public involvement process, community members identified the need to keep Carpenterville Road open to truck traffic when US 101 is closed. The cost to improve the road to a level where it could safely be used by two-way traffic is quite high. It was assumed that the road would have to be widened from its current 20-foot width to 32 feet, to accommodate two 12-foot travel lanes and four foot paved shoulders. The cost to make this improvement was estimated at $500,000 per mile for the eight miles at the south end and the eight miles at the north end, and at $ 1 million per mile for the middle eight miles, resulting in a total project cost of $16 million. This cost would be borne by the State (ODOT).

An option to a major widening project would be to keep the road in its existing condition, and simply restrict truck use to certain hours of the day during an emergency. For example, the road use could be dedicated to northbound trucks for one hour in the morning and one hour in the evening, followed by one hour dedicated to southbound trucks in the morning and one hour in the evening. During the other 20 hours of the day the road would remain open for two-way passenger car traffic. This option would have no capital costs; the only costs incurred would be those resulting from vehicular enforcement at the north and south ends of the road.

Recommendation: It is recommended that Elk River Road, along with Euchre Creek Road and Forest Service Road 5502 be developed as a parallel, alternative route to US 101 for emergencies. This can be accomplished by raising the maintenance level from Level 3 to Level 4. The cost for this project is estimated at $1.8 million, with annually occurring maintenance costs of $10,800. This was identified by the community as a high priority project.

Deferred maintenance, which is maintenance activities that can be delayed without critical loss of facility serviceability until such time as the work can be economically or efficiently performed, also needs to be recognized. Deferred maintenance cost for Level 3 roads are $5,400 per mile and Level 4 roads are $35,300 per mile. Deferred maintenance work items could include seal coats, surface replacement, bridge painting, and culvert replacement.

All of the per mile rates are average rates for typical roads. The Euchre Creek Roads is not a typical road in that it normally experiences damage during the winter months ranging from slides on the roadway to slumping roadway and total roads failures. The Forest Service could easily plan to send, on average and additional $25,000/year. Some years such as 1996 and 1998, repair costs (not maintenance) will exceed $300,00.

There are two private landowners, South Coast Lumber Company and John Hancock Company, who are cooperators with the Forest Service in maintaining most Eurchre Creek Road. They would need to be in agreement with any changes to that road.

Something that has not been factored in is traffic volume. Forest Service roads are not designed nor constructed for heavy traffic volume. The highest maintenance level road is a Level 5. It is a double lane, paved road with average daily traffic for the past 6 years of only 225 vehicles. A sudden increase in heavy commercial use was experienced when US 101 went out at the Arizona slide. The pavement aggregate rapidly began to deteriorate. The maintenance costs are for typical Forest Service Roads that have been designed and constructed for low traffic volumes and reduced speeds. The average daily traffic from emergency use has not been determined at this time.

It is recommended that Carpenterville Road be kept in its existing condition, rather pursue an expensive widening project (estimated to cost $16 million). During emergency situations, where sections of US 101 which can be bypassed by Carpenterville Road are closed, trucks should not be unconditionally prohibited from using the road. Instead, trucks should be restricted to certain hours of the day during an emergency. This recommendation would have no capital costs; the only costs incurred would be those resulting from vehicular enforcement at the north and south ends of the road.

Meyers Creek Road, Cape View Road, Ophir Road, North Bank Rogue River Road and Edson Creek Road, and North Bank Rogue River Road and Squaw Valley Road can all be used as alternates to US 101 without any physical improvements. These roads are all identified as such in this Plan.

Option 15. Implement Transportation Demand Management Strategies

Overview: Transportation demand management (TDM) strategies change the demand on the transportation system by providing facilities for modes of transportation other than single occupant passenger vehicles, such as implementing carpooling programs, altering work shift schedules, and applying other transportation measures within the community. The State Transportation Planning Rule recommends that cities should evaluate TDM measures as part of their Transportation System Plans.

TDM strategies are most effective in large, urban cities; however, some strategies can still be useful in small cities such as Brookings. For example, staggering work shift schedules at local businesses may not be appropriate in Brookings since there are no large employers in the area; however, provisions for alternative modes of transportation, such as sidewalks and bike lanes, and implementing a county-wide carpooling program can be beneficial for residents of the city. In rural communities, TDM strategies include providing mobility options.

Impacts: Although the primary goal of these measures is to reduce the number of vehicle trips made within the city, especially during peak periods, street capacity for automobiles and trucks is generally not an issue in Brookings. However, improvements to connect sidewalks that are currently disconnected or the provision of new pedestrian and bicycle facilities increases the livability of a city, and improves traffic and pedestrian safety. With more emphasis on walking or biking in the city, conditions such as air quality and noise levels would be improved as well.

Cost Estimate: Unit costs for typical TDM projects are as follows:

- Concrete Sidewalks – The estimated cost to install new sidewalks on one side of an existing street is approximately $15 per linear foot. This assumes a five-foot wide walkway is composed of 4 inches of concrete over two inches of aggregate.
- Multi-use Paths – A multi-use path 10 feet wide would cost approximately $16 per linear foot. This assumes the path is constructed of two inches of asphalt over four inches of aggregate.
- Paved Shoulders – Shoulders that are four feet wide constructed along both sides of a road would cost approximately $25 per linear foot. This is based on four inches of asphalt over nine inches of aggregate.
- Bike Lanes – The cost to install bike lanes on both sides of an existing road is approximately $45 per linear foot. This cost includes widening the roadway by five feet on both sides, installing curbs, four inches of asphalt over nine inches of aggregate, and placement of an eight-inch painted stripe.
- Striping – The cost to strip a typical crosswalk is $3 per linear foot; the cost to paint an eight-inch stripe for a bike lane is approximately $0.70 per linear foot.
- Rideshare program – A rideshare program could be operated for a cost of approximately $20,000 per year. For comparison purposes, a rideshare program located in Central Oregon, covering a larger geographic area and serving a larger population, has an annual operating budget of approximately $50,000. ODOT participates in this program by providing approximately 60 percent of the funding.

Recommendation: Brookings can implement TDM strategies by requiring all future street improvement projects to include the addition of some sort of pedestrian facility, such as new sidewalks or walkways, which will effectively separate pedestrians from motorized traffic. Connecting sidewalks that are not currently connected on some streets can increase the effectiveness of the pedestrian facilities.

Implementing a local carpool program in Brookings alone is not necessary because of Brookings' geographical size; however, a county-wide carpool program is possible. Residents who live in Brookings and residents who live in other cities and rural areas should be encouraged to carpool with a fellow

coworker or someone who works in the same area. Carpooling can take advantage of excess parking at larger retail areas, or parking unused during the week, such as at churches. Costs are typically limited to those needed for a part-time to full-time program administrator to provide public education, advertising, and coordinate park and ride lots and signs.

SUMMARY

Table 6-1 summarizes the recommendations of the improvement options analysis based on the evaluation process described in this chapter. Chapter 7 discusses how these improvement options fit into the modal plans for the Brookings area.

TABLE 6-1
TRANSPORTATION IMPROVEMENT OPTIONS: RECOMMENDATION SUMMARY
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Option	Recommendation
1. Revise zoning and development codes	Implement
2. Improve intersection of Constitution Way and US 101	Implement
3. Improve US 101 from north of Carpenterville Road and Arnold Lane	Complete traffic impact study for development and work with ODOT on development of incremental mitigation improvements
4. Construct the US 101 couplet in the City of Brookings	Implement per improvement identified through downtown Environmental Assessment
5. Improve intersection of Benham Lane and US 101 Intersection/ Create Harbor Hills Connections	Complete traffic impact study for development and work with ODOT on development of incremental mitigation improvements
6. Improve intersection of Benham Lane and Ocean View Drive	Implement
7. Improve Parkview Drive	Implement
8. Improve unsignalized intersections	Do not implement
9. Improve signalized intersections	Do not Implement
10. Improve arterial and collector street segments	Implement
11. Improve the intersection of Lower Harbor Road and Shopping Center Road	Do not implement
12. Construct third lane on US 101	Do not implement
13. Improved east-west connection to I-5	Do not implement; maintain existing road
14. Develop an alternative route to US 101	Implement
15. Implement transportation demand strategies	Implement as needed

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 Brookings 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.

STREET DESIGN STANDARDS

Street 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 that 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 Street Standards

Existing street standards for the City of Brookings are outlined in the City of Brookings Land Development Code, adopted in April 1989. This document states that unless otherwise indicated in the transportation element of the Comprehensive Plan, or in an adopted neighborhood circulation plan, the street right-of-way and roadway widths shall not be less than the minimums shown in Table 7-1.

TABLE 7-1
EXISTING RIGHT-OF-WAY AND ROADWAY WIDTH STANDARDS

Type of Street	Minimum Right-of-Way Width (feet)*	Minimum Roadway (Curb face to face) Width (feet)
Major Arterial (US 101)		
(a) With median and curbside	100	90
(b) Without median and curbside	100	70
Arterial	80	44
Residential (Collector)	50	36
Residential (Upon which a maximum of 20 dwelling units front and take access)	45	30
Cul-de-sac Radius	45	36
Commercial /Industrial	60-80	44
Alley	20	20

The Planning Commission may accept narrower right-of-way widths under special circumstances. (See Land Development Code, Section 172, Page 5).

Sidewalks are required, in most cases, along all roads and shall be a minimum of six feet in width, not including the curb width. Bicycle facilities may be required within, or adjacent to, streets if they are appropriate to the extension of existing or planned bicycle route(s).

Requirements for integrating pedestrian and bicycle facilities into the existing roadway standards are somewhat vague. State law is clear on requirements for pedestrian and bicycle facilities. Oregon Revised

Statute (ORS) 366.514 Use of Highway Fund for Footpaths and Bicycle Trails requires the inclusion of bikeways and walkways whenever highways, roads, and streets are constructed, reconstructed or relocated, with three exceptions (where there is no need or probable use, where safety would be jeopardized, or where the cost is excessively disproportionate to the need or probable use). Oregon Administrative Rule (OAR) 660-12 The Transportation Planning Rule requires bike lanes along arterials and major collectors and requires sidewalks along arterials, collectors, and most local streets in urban areas, except that sidewalks are not required along controlled access roadways, such as freeways.

Recommended Street Standards

The development of the Brookings Transportation System Plan provides the city 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. Standards for local streets are adopted by the City of Brookings and are shown in Table 7-2. Standards for US 101 are shown in Table 7-3 and approximations only. Highway standards are contained in the ODOT Highway Design Manual and are occasionally revised. The standards shown in the TSP are recommendations rather than adopted standards and therefore may be altered during the development of highway construction or reconstruction projects. Collector and local residential and commercial streets

TABLE 7-2
DESIGN STANDARDS FOR LOCAL STREETS*

Type of Street	Right-of-Way Width	Roadway Width	Sidewalk Width
Collector			
Urban	50 feet	36 feet	6 feet – both sides
Rural	50 feet	24 feet	4-ft. paved shoulder both sides
Residential (maximum of 20 d.u.)	45 feet	30 feet	6 feet – both sides
Cul-de-sac Radius	45 feet	36 feet	
Commercial/Industrial	60 feet	44 feet	6 feet – both sides
Alley	20 feet	20 feet	none

*Unless designed to an approved neighborhood circulation plan standard, proposed streets with a wider or narrower standard must be approved by the Planning Commission.

TABLE 7-3
RECOMMENDED DESIGN STANDARDS FOR US 101

Type of Street	Minimum Right-of-Way Width	Minimum Roadway Width	Sidewalk Width
Arterial (US 101) [1]			
Outside of proposed couplet	80 feet	70 feet	5 feet – both sides [2]
Proposed couplet 'Section A'	70 feet	42 feet	8 feet – both sides [3]
Proposed couplet 'Section B'	80 feet	58 feet	8 feet – both sides [3]
Proposed couplet 'Section C'	70 feet	50 feet	8 feet – both sides [3]

[1] Arterial standards are recommendations only. Actual design standards for US 101 are found in the ODOT Highway Design Manual

[2] Sidewalks should be a minimum of 5 feet and should be 6 feet where there is sufficient right-of-way

[3] Sidewalks should be minimum of 8 feet and should be 10 feet where there is sufficient right-of-way

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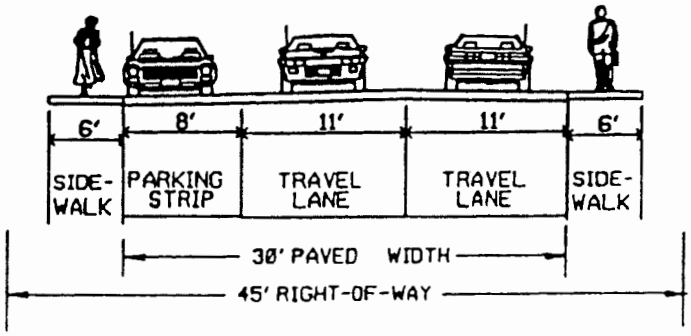

TWO TRAVEL LANES, ON-STREET PARKING ON ONE SIDE ONLY

FIGURE 7–1

Recommended Street Standards
Brookings Local Residential Streets

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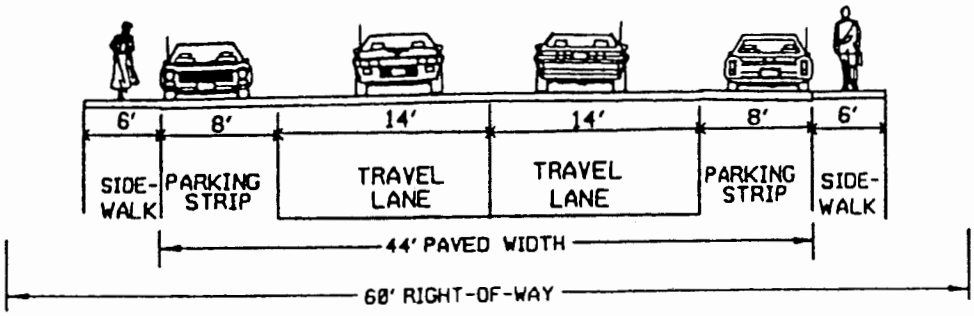
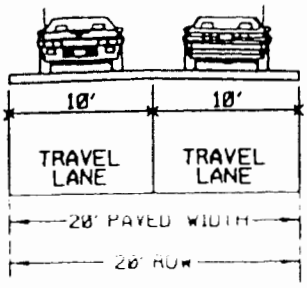


COMMERICAL / INDUSTRIAL STREETS
TWO TRAVEL LANES WITH ON-STREET PARKING



ALLEYS

FIGURE 7-2

Recommended Street Standards

Brookings Commerical/Industrial Streets and Alleys

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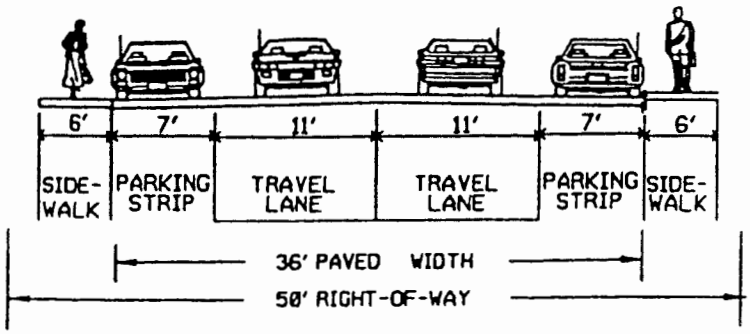
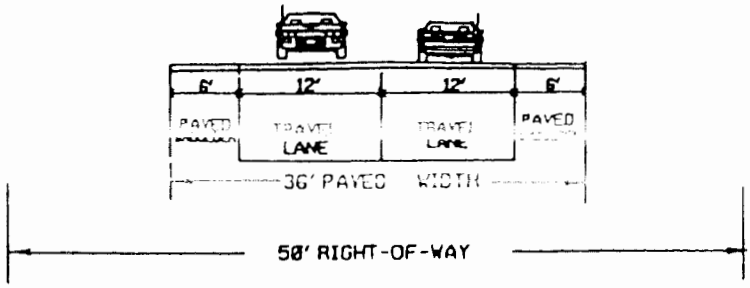


IN URBAN AREAS: TWO TRAVEL LANES, ON-STREET PARKING ON BOTH SIDES



IN RURAL AREAS: TWO TRAVEL LANES, NO ON-STREET PARKING, PAVED 6-FOOT SHOULDER

FIGURE 7–3

Recommended Street Standards
Brookings Collector Streets

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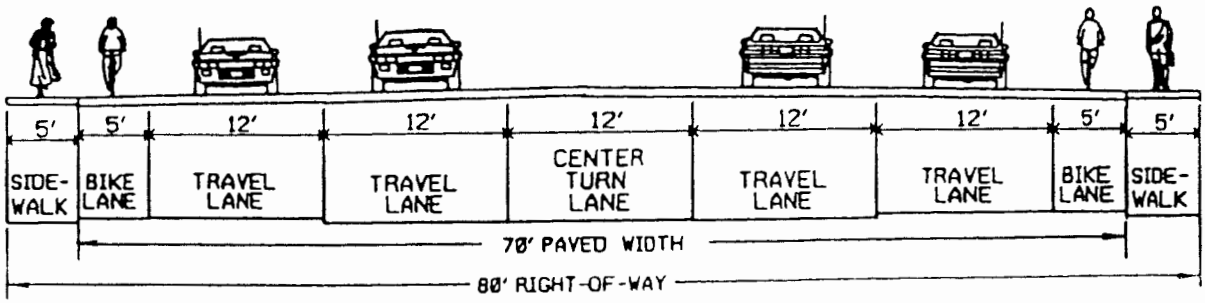

STANDARD FOR HIGHWAY 101 EXCLUDING COUPLET

FIGURE 7-4

Recommended Street Standard. Brookings Arterial Streets

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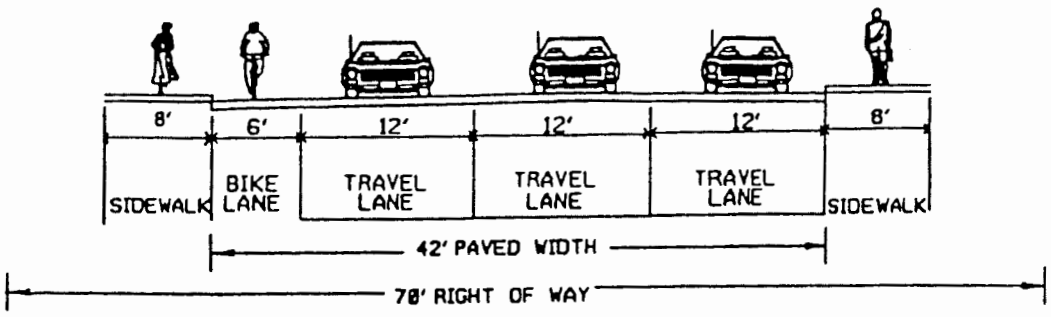
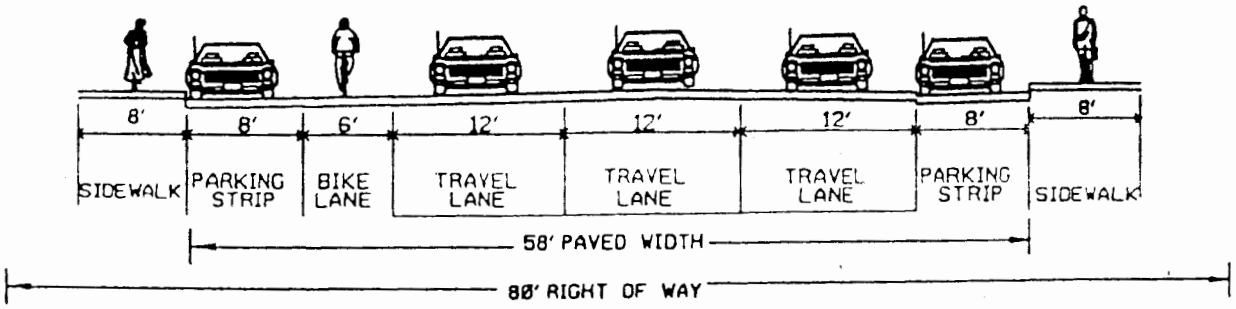
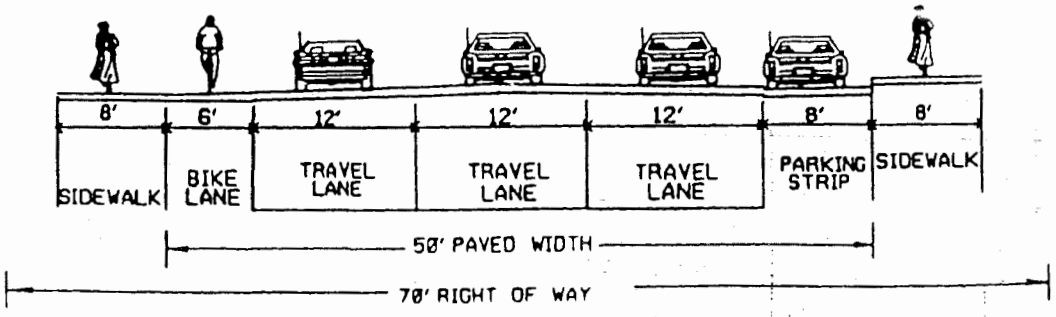


STANDARD FOR HIGHWAY 101 COUPLET-SECTION "A"



STANDARD FOR HIGHWAY 101 COUPLET-SECTION "B"



STANDARD FOR HIGHWAY 101 COUPLET-SECTION "C"

FIGURE 7-5

Recommended Street Standards
Brookings Arterial Streets

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.

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 poles, and sign poles, which reduce the effective width of the sidewalk. 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 for disabled persons. To maintain a safe and convenient walkway for at least two adults, a six-foot sidewalk should be used in residential areas.

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 fewer than 1,200 vehicles per day. Design speeds should be 15 to 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.

Cul-de-sac, or "dead-end" residential streets are intended to serve only the adjacent land in residential neighborhoods. These streets should be short (less than 300 feet long) and serve 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 and one lane of traffic when vehicles are parked at the curb.

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.

Local residential streets have property access as their main priority; through traffic movement is not encouraged. The majority of streets in Brookings are local residential streets. The recommended standard for residential streets is described below, and fits within the city's existing required minimum pavement width of 30 feet and the required minimum right-of-way of 45 feet. It also includes sidewalks, as required by law, and on-street parking on one side. This does not mean that parking must be limited to one side; however, if vehicles are parked on both sides of the road, only one moving lane will fit between the two parked cars, and on-coming traffic will have to yield. This is usually not a problem on low-volume residential streets. This standard is intended for streets which serve a maximum of 20 dwelling units. This cross section is shown in Figure 7-1.

Standard for Local Residential Streets

The standard consists of two 11-foot travel lanes and an 8-foot parking strip on one side of the roadway. The resulting paved width is 30 feet. The standard also includes 6-foot sidewalks, adjacent to the curbs. This option fits within the city's required right-of-way of 45 feet for residential streets.

Technical Advisory Committee members requested that the street standards ordinance provide some flexibility where there are topographic constraints, such as hillside slopes greater than 15 percent. The street standard ordinance prepared by the consultant should allow for exceptions to sidewalk and pavement width requirements in those areas.

Commercial/Industrial Streets

Commercial/industrial streets serve short trips, provide access to each adjacent parcel and serve high volumes of truck traffic. The recommended standard for commercial/industrial Streets meets the existing minimum pavement and right-of-way widths. The recommended standard for commercial/industrial streets consists of one 14-foot travel lane in each direction with an 8-foot parking strip on both sides of the street. The wide lanes are warranted to accommodate the high volume of large trucks using these streets. The resulting paved width is 44 feet. Six-foot sidewalks are included on both sides of the street, and the roadway cross section fits within the existing street standards for commercial and industrial streets (see Figure 7-2).

Alleys

Alleys 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 rear access for delivery trucks. Alleys should be encouraged in the urban area of Brookings. The recommended standard for alleys includes two 10-foot paved travel lanes within a 20-foot right-of-way. This standard is the same as the existing standard for alleys (see Figure 7-2).

Collector Streets

Collectors are intended to carry between 1,200 and 10,000 vehicles per day, including limited through traffic, at a design speed of 25 to 35 mph. A collector can serve residential, commercial, industrial, or mixed land uses. Collectors are primarily intended to serve local access needs of residential neighborhoods through connecting local streets to arterials. Bike lanes are typically not needed due to slower traffic speeds.

Two standards were developed for collectors, an urban standard, for collectors whose adjacent land use would necessitate on-street parking and sidewalks, and a rural standard for those which would not require on-street parking and sidewalks. The recommended standards for both are described below, and shown in Figure 7-3.

Standard for Urban Collector Streets

The standard consists of two 11 foot travel lanes and 7-foot parking strips on both sides of the roadway. The resulting paved width is 36 feet. The standard also includes 6-foot sidewalks, adjacent to the curbs. This option fits within the city's required right-of-way of 50 feet.

This standard should be applied to the following collectors: Hillside Avenue, Pacific Avenue, Azalea Avenue, Constitution Way, Center Street, Railroad Street, Memory Lane, Del Norte Lane, Pioneer Road, Dawson Road, and Oak Street. Easy Street will be an exception, with sidewalks on one side only.

Standard for Rural Collector Streets

The standard consists of two 12-foot travel lanes and 4-foot paved shoulders (which can be used by pedestrians and bicyclists) on both sides of the roadway. The resulting paved width is 32 feet. This option fits within the city's required right-of-way of 50 feet.

This standard should be applied to the following collectors: Carpenterville Road, North Bank Chetco River Road, South Bank Chetco River Road, Lower Harbor Road, West Benham Lane, Shopping Center Avenue, Oceanview Drive, Old County Road, and Crown Terrace.

Arterial Streets

Arterials connect cities and other major traffic generators; they serve both through traffic and trips of moderate length and access is usually controlled. 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 high capacity roadways that carry high traffic volumes with minimal localized activity. Design speeds should be between 25 and 45 mph..

The only street classified as an arterial in the City of Brookings is US 101. Standards for state highways are contained in ODOT's Highway Design Manual (HDM). The city has developed recommended standards for US 101 which are similar to those in the HDM. As sections of US 101 are built or reconstructed, the city recommends ODOT consider these standards in the design.

Four recommended standards were developed for US 101: a five-lane cross section for segments of the highway which are north or south of the proposed downtown couplet and three 3-lane cross sections for the couplet which have on-street parking either on one side, both sides, or no on-street parking. (The cross sections for the couplet were actually designed by W&H Pacific, the consultant who prepared the Brookings/US 101 One-way Couplet Analysis for the City of Brookings and ODOT.) These standards are shown in Figures7-4 and 7-5.

Recommended Standard for US 101, Excluding the Couplet

This cross section consists of four 12-foot travel lanes, a 12-foot center turn lane, and 5-foot bike lanes on both sides of the roadway. The resulting paved width is 70 feet. Streets this wide visually divide a community and result in imposing distances for pedestrians to cross; however, this cross section will only apply to areas with low pedestrian volumes outside downtown Brookings. In addition, this cross section is similar to what exists today along much of the highway. This option also includes 6-foot sidewalks adjacent to the curbs. The total required right-of-way for this cross section is 82 feet.

This standard would apply to the segment of US 101 north of the proposed couplet (approximately Mill Beach Road) to the north city limits and south of the proposed couplet (approximately Alder Street) to Benham Lane in Harbor. The south segment includes the bridge over the Chetco River and there would be no center turn lane on the bridge due to the physical width constraint on the bridge and no need for left turn refuges on the bridge itself.

It is important to note that there is strong support in the community for extending the center turn lane on US 101 south for approximately five miles to the Oregon-California border. David Scott presented the consultant with a petition signed by over 300 citizens in favor of this improvement. Their understanding is that ODOT currently has sufficient right-of-way for a five-lane segment, and that no land acquisition would be required.

Recommended Standard for US 101 Couplet – Section "A"

This cross section consists of three 12-foot travel lanes, a 6-foot bike lane on the right side of the road, and no on-street parking. The resulting paved width is 42 feet. This option also includes 8 feet for sidewalks. This cross section was designed to fit within a 70-foot right-of-way and would be used in the northern and southern segments of the couplet, where sufficient on-site parking exists for local businesses.

Specifically, this cross section could be used on the southbound roadway from the north end of the couplet to Wharf Street and from Oak Street to the south end of the couplet. It would also be

appropriate on the northbound roadway from Alder Street to Oak Street and from 5th Street to the north end of the couplet.

Recommended Standard for US 101 Couplet – Section "B"

This cross section consists of three 12-foot travel lanes, a 6-foot bike lane on the right side of the road, and on-street parking on both sides of the roadway. The resulting paved width is 58 feet. This option also includes 8 feet for sidewalks. This cross section was designed to fit within an 80-foot right-of-way and would be used on the segments of the couplet which are close to the core of downtown Brookings, where there are existing residential uses, and where commercial development is adjacent to the sidewalk.

Specifically, this cross section would be appropriate on the southbound roadway from Wharf Street to Oak Street and on the northbound roadway from Fern Street to 5th Street.

Recommended Standard for US 101 Couplet – Section "C"

This cross section consists of three 12-foot travel lanes, a 6-foot bike lane on the right side of the road, and on-street parking on the left side of the roadway. The resulting paved width is 50 feet. This option also includes 8 feet for sidewalks. This cross section was designed to fit within a 70-foot right-of-way and would be used in the vicinity of the car dealership. This configuration was designed to preserve access and visibility of this business. Security issues were raised with respect to allowing parking along the face of the dealer's show-space. This roadway cross section provides a transition between Sections A and B.

Specifically, this cross section would be appropriate on the northbound roadway from Oak Street to Fern Street.

Bike Lanes

In cases where a bikeway is proposed within the street right-of-way, 12 feet of roadway pavement (between curbs) should be provided for a six-foot bikeway on each side of the street, as shown on the cross sections in Figure 7-3. 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 that lead directly to schools should be high priority.

Sidewalks

A complete pedestrian system should be implemented in the urban portion of Brookings. Every urban street should have sidewalks on both sides of the roadway as shown on the cross sections in Figure 7-1 through Figure 7-3. Sidewalks should have a six-foot wide paved width. In addition, pedestrian and bicycle connections should be provided between any cul-de-sac or other dead-end streets.

Another essential component of the 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 as traffic calming measures and to decrease pedestrian crossing distance.

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 the City of Brookings' relative lack of congestion is in part due to its grid system. Ensuring that this grid is extended as development occurs is critical to Brookings' continued livability. To this end, a maximum block perimeter of 1,200 feet is recommended.

ACCESS MANAGEMENT

Access management is an important tool for maintaining a transportation system. 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 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 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.
- 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.

Recommended Access Management Standards

Access management is hierarchical, ranging from complete access control on freeways to increasing use of streets for access purposes at the local level. Tables 7-4 and 7-5 describe recommended access management guidelines by roadway functional classification. Table 7-4 presents access standards for US 101 as shown in the Oregon Highway Plan at the time of TSP adoption. The standards contained in the Highway Plan take precedence over those shown below if different.

TABLE 7-4
ACCESS MANAGEMENT STANDARDS FOR STATEWIDE HIGHWAYS (US 101)

Posted Speed	General	UBA [1]	STA [2]
>=55 MPH	1320	—	—
50 MPH	1100	—	—
40 & 45 MPH	990	—	—
30 & 35 MPH	770	720	—
<=25 MPH	550	520	See Note 3

[1] Urban Business Area

[2] Special Transportation Area

[3] Minimum spacing standards for public road approaches is either the existing city block spacing or the city block spacing as identified in the local comprehensive plan. Public road connections are preferred over private driveways, and in STAs driveways are discouraged. However, where driveways are allowed and where land use patterns permit, spacing for driveways is less than 350 feet.

TABLE 7-5
RECOMMENDED ACCESS MANAGEMENT STANDARDS FOR LOCAL STREETS

	Intersections			
	Public Road		Private Drive[(2)]	
Functional Classification	Type[(1)]	Spacing	Type	Spacing
Arterial (See Table 7-4) [3]				
Collector	at-grade	250 ft.	L/R Turns	100 ft.
Residential Street	at-grade	250 ft.	L/R Turns	Access to Each Lot
Alley (Urban)	at-grade	100 ft.	L/R Turns	Access to Each Lot

[1] For most roadways, at-grade crossings are appropriate.

[2] 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] Access spacing standards for State facilities are presented in the Oregon Highway Plan which, if different, take precedence over those shown above.

Application

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 be 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.

State Highways

Access management is important to promoting safe and efficient travel for both local and long distance users along US 101 in Brookings. The Oregon Highway Plan specifies access spacing standards for all state highways. This section of the Transportation System Plan describes the state highway access categories and specific roadway segments where special access areas may apply.

General

US 101 through Brookings is designated in the Oregon Highway Plan as a Statewide Highway on the National Highway System (NHS). Within the Brookings UGB, OHP spacing standards vary based on the posted speed limit. Refer to Table 7-4 above or Appendix C of the Highway Plan for specific spacing standards on US 101.

Special Transportation Area

As in many cities with a State Highway serving as the primary arterial, road approach spacing does not meet existing spacing standards. In some cases, local street intersections are as close as 250' apart. Shorter block lengths and a well-developed grid system are important to a downtown area, along with convenient and safe pedestrian facilities. In general, downtown commercial arterial streets typically have blocks 200 to 400 feet long, driveways sometimes spaced at intervals as frequent as every 100 feet and, occasionally, signals spaced as closely 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.

To address this issue and to protect the downtown function of this section of highway, a Special Transportation Area (STA) is recommended from Pacific Avenue to just south of Alder on US 101 and extending to the west to include properties fronting the south side of Railroad Ave. Specific boundaries will be determined when the STA management plan is developed. The city will develop a management plan for the STA area in consultation with ODOT. The required management plan will address capacity, safety, needed improvements, recommended land use changes, and vehicle and pedestrian access issues.

To accommodate existing public roadway spacing and allow reasonable access spacing for private driveways, less restrictive access and capacity standards will be allowed within the STA. Within the STA, access standards shall allow intersection spacing at a minimum of 250 feet. As specified in the OHP, driveways will be discouraged within the STA. (See Table 7-4).

MODAL PLANS

The Brookings 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 Brookings 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. Specific projects and improvement schedules may need to be adjusted depending on when and where growth occurs within Brookings.

Street System Plan

The street system plan outlines a series of improvements that are recommended for construction within the City of Brookings during the next 20 years. 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 7-4. The projects are listed as high priority (construction expected in the next 0 to 5 years), medium priority (construction expected in the next 5 to 10 years), and low priority (construction expected in the next 10 to 20 years).

Collectors

Several roadways in the city have sub-standard lane widths. The transportation system throughout the city would benefit from upgrading collectors that have lanes 10 feet wide or narrower and include bicycle and pedestrian facilities. The standards for collectors with adjacent rural land uses would include 12-foot travel lanes, with 4-foot paved shoulders for bicycle and pedestrian uses on both sides of the roadway. The standards for collectors located in urban areas would include 11-foot lanes, and 7-foot parking strips and 6-foot sidewalks on both sides of the roadway. The following roadways would benefit from upgrading to collector standards:

- Old County Road through the study area;
- Carpenterville Road between US 101 and Cape Ferrelo Road;
- Easy Street between US 101 and Fern Avenue;
- Pelican Bay Drive (an existing private road) for its entire length; and
- Parkview Drive to the Brookings Airport.

Statewide Transportation Improvement Program (STIP) Projects

The Oregon Department of Transportation has a comprehensive transportation improvement and maintenance program encompassing the entire state highway system. The Statewide Transportation Improvement Program (STIP) is adopted by the Oregon Transportation Commission (OTC) every two years and identifies all funding for highway improvement projects in the state for a four-year period. The draft 2002-2005 STIP, to be adopted by the OTC in early 2002, identifies no highway projects scheduled within the City of Brookings.

Bridge Projects

Within the City of Brookings, there is one state-owned and maintained bridge that is part of ODOT's inventory system. The bridge (ODOT bridge No. 01143D) is located along US 101 (MP 357.96) crossing the Chetco River at the south city limits. According to the ODOT bridge inventory data, this bridge is currently rated as functionally obsolete. Bridges that fall into this category usually need to be repaired or replaced some time in the next 20 years. Functionally obsolete bridges are structurally sound, but have some other design deficiency such as being too narrow for today's standards, having poor approach roads, or having guardrails which do not meet today's standards. According to the ODOT bridge inventory data, this bridge is currently rated as functionally obsolete because it does not meet the minimum lateral underclearance recommended. This means that the columns supporting the bridge are located less than 20 feet from the edge of the pavement of the roadway underneath (the desired minimum horizontal clearance).

Conversations with staff in ODOT's Bridge Section indicated that in all likelihood, during the next bridge inspection, the functionally obsolete classification would be removed from this bridge. Nonetheless, ODOT prepared a cost estimate of $12.5 million in 1995 to bring the lateral underclearance to today's standards. The bridge is not listed for repair or replacement in the current STIP, and considering that the bridge is structurally sound and its functionally obsolete classification may be reconsidered, it is not listed as a recommended improvement in this plan.

Safety Improvement Projects

Several safety improvement projects have been identified in this Transportation System Plan to address specific safety issues within the City of Brookings. These include the improvements to:

- Intersection of Constitution Way and US 101 – This intersection has been identified as a hazardous location due to confusing and conflicting turn movements. The improvements for this intersection reduce conflicting movements and merge points and improve pedestrian safety by eliminating the right-turn channelization for northbound US 101 and the southern most truck access lane to the weigh station.
- Intersection of Benham Lane and Ocean View Drive – The improvements address the poor sight distance due to the skewed angle of the intersection and the grades on both the roads. The recommended improvement realigns the northbound approach lane on Ocean View Drive to the east such that it effectively becomes a channelized right turn lane eventually paralleling Benham Lane before merging.

Oregon Coast Highway Corridor Master Plan Projects

The Oregon Coast Highway Corridor Master Plan was prepared in 1995 to coordinate land use patterns and transportation system improvements in the US 101 corridor. The plan was developed in partnership with local, state, and federal jurisdictions, and the public and communities that the Plan is designed to serve. Because of the Plan's date and the changes that have occurred within ODOT's corridor planning system, the Plan is considered to be advisory in purpose. The projects recommended in the Plan should be investigated further, but will not be amended into the STIP as is.

The Oregon Coast Highway Corridor Master Plan's focus in Curry County is to enhance and protect the scenic beauty of the corridor while increasing capacity and reliability on the transportation system. Although the plan does not list specific transportation improvements on US 101, several Plan Activities were identified for the section of highway in Brookings. The jurisdiction or agency that has primary responsibility for implementation of the plan activities was not identified. In most cases, implementation will require coordination among a number of jurisdictions and agencies. The Plan Activities for the highway section in Brookings include:

- Investigate the potential for improving the local circulation system in an effort to reduce reliance on US 101 for local traffic.
- Investigate options to accommodate the high growth anticipated and additional travel demand including: developing an access management plan and parking strategy consistent with the State Access Management Category and allowing adequate commercial access; coordinating traffic signal operation; incorporating the City's bicycle/pedestrian circulation strategy to improve safety and accessibility; investigating options for providing a couplet through the city; identifying ways to improve transit/para-transit service and implement TDM strategies; and identifying the feasibility of and locations for passing lanes north of the city.
- Develop a community design program for Brookings that incorporates the following elements: a parking strategy for both on-street and off-street parking; gateway/visitor center improvements at

the entrances to Brookings; pedestrian and landscape improvements; informational and directional signage; utilities relocated outside of ocean views.

- Identify a process for developing an emergency route plan.

Each of the planned activities has been addressed in this transportation system plan. The US 101 couplet and the arterial and collector improvements previously discussed would accommodate the additional travel demand and improve local circulation along US 101. TDM measures include facilities for modes of transportation other than single-occupancy vehicles, such as sidewalks, bicycle lanes, and carpooling programs. Developing an emergency route plan has been addressed by the improvements to the east-west connection between US 101 and I-5, and developing an alternative route to US 101 for when the highway is closed.

TABLE 7-6
RECOMMENDED STREET SYSTEM PROJECTS

Location	Project	Priority	Cost
US 101	Improve Intersection of US 101 and Constitution Way	High	$170,000
US 101	Construct the US 101 one-way couplet or other recommended improvements	High	$13,000,000
US 101	Develop an alternative route to US 101 for emergency purposes.	High	$1,800,000
US 101	Improve Intersection of Benham Lane and US 101 Intersection/Construct Harbor Hills Connections	High	Not Available at this time–to be determined through Traffic Impact Studies
US 101	Improve US 101 north of Carpenterville Road to Arnold Lane	High	Not Available at this time–to be determined through Traffic Impact Studies
Benham Lane	Improve the intersection of Benham Lane and Ocean View Drive in Harbor	High	$50,000
US 101 to I-5	Improve east-west connection	High	Not Available at this time
Parkview Drive	Improve Parkview Drive to the Brookings Airport	Medium	$600,000
E. Benham Lane	Construct to collector standards	Medium	$200,000
Pioneer Road	Construct a third lane	Medium	$400,000
Old County Road	Upgrade collectors to standard width	Medium	$700,000
Carpenterville Road	Upgrade collectors to standard width	Medium	$360,000
Pelican Bay Drive (Private Street)	Upgrade collectors to standard width	Medium	$300,000
Easy Street	Upgrade collectors to standard width	Low	$530,000
Subtotal High Priority Projects			$15,020,000
Subtotal Medium Priority Projects			$2,560,000
Subtotal Low Priority Projects			$530,000

TOTAL COST	$18,110,000*

* Total does not include improvements on US 101 north of Ransom Ave. or near Benham Lane or to improve the connection between US 101 and I-5

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, except where topography, existing development, or other circumstances prevents them. 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 revealed that sidewalks are generally provided throughout downtown Brookings, although they are frequently not continuous. Many of the existing roadways outside of the downtown area do not have sidewalks, or sidewalks are segmented and curb cuts are lacking.

The city's sidewalk system should be expanded to include, at a minimum, sidewalks along both sides of US 101 along developed lands. Other blocks within the city's grid system that have a significant amount of pedestrian activity, such as in front of stores or schools, etc., should also have sidewalks. The existing sidewalk network is generally disjointed, with missing connections between sidewalks, which may discourage pedestrian travel, particularly where connections between neighborhoods and schools are lacking. Street segments where new sidewalks are recommended to complete the sidewalk system include:

- Ransom Avenue, both sides, from Pioneer Road to west of 5th Street;
- Pioneer Road, west side between Easy Street and Ransom Avenue and east side between Pacific Avenue and Ransom Avenue;
- Easy Street, both sides between Pioneer Road and Fern Avenue, to serve Kalmiopsis School; and
- US 101, north side between Alder Street and the Chetco River Bridge.

The primary goal of a complete pedestrian system is to improve pedestrian safety; however, an effective sidewalk system has several qualitative benefits as well. Providing adequate pedestrian facilities increases the livability of a city. When pedestrians can walk on a sidewalk, separated from vehicular street traffic, it makes the walking experience more enjoyable and may encourage walking, rather than driving, for short trips. Sidewalks enliven a downtown and encourage leisurely strolling and window shopping in commercial areas. This "Main Street" effect improves business for downtown merchants and provides opportunities for friendly interaction among residents. It may also have an appeal to tourists as an inviting place to stop and walk around.

New sidewalks should be constructed with curb cuts for wheelchairs at every crosswalk to comply with the Americans with Disabilities Act (ADA).

Table 7-7 contains a list of specific pedestrian improvements that will be needed over the next 20 years. (Figure 7-5 also shows these projects). Sidewalks should be added as new streets are constructed and existing streets reconstructed. The implementation program identifies an approximate schedule for these improvements.

TABLE 7-7
RECOMMENDED PEDESTRIAN PROJECTS

Location	Project	Priority	Length (ft)	Cost
Ransom Avenue	New sidewalk on both sides of the road from Pioneer Road to west of 5th Street	High	4,948	$148,000
Pioneer Road	New sidewalk on west side between Easy Street and Ransom Avenue	High	650	$20,000
Pioneer Road	New sidewalk on east side between Pacific Avenue and Ransom Avenue	High	1,293	$39,000
US 101	New sidewalk on north side between Alder Street and the Chetco River Bridge	High	1,641	$49,000
Easy Street	New sidewalk on both sides between Pioneer Road and Fern Avenue, to serve Kalmiopsis School	Low	2,404	$72,000
TOTAL FOR HIGH PRIORITY PROJECTS				$256,000
TOTAL FOR LOW PRIORITY PROJECTS				$72,000
TOTAL COST				$328,000

The on-street 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.

Bicycle System Plan

The goals and objectives of the city's bicycle plan include reducing conflicts between bicyclists and motorized vehicle traffic, developing a system dedicated to bicycles, and providing opportunities for recreational bicycle use.

Shared roadways, where bicyclists share normal vehicle lanes with motorists, are generally acceptable if speeds and traffic volumes are relatively low. On the collector and local streets in Brookings, shared roadways are sufficient not an issue; however, on arterial roadways bike lanes are recommended.

US 101 functions as an arterial street through Brookings, which means that it should have bike lanes on both sides of the street as specified in the recommended street standards and as required by the TPR. Accident statistics on the highway do not indicate that there are frequent conflicts between bicyclists and motorized vehicles. To install bicycle lanes along US 101 would involve removing on-street parking through downtown Brookings and shoulders would need widening on sections where no on-street parking exists. Improvements could be expensive or controversial, or both. At this time, no specific bikeway improvements are recommended for US 101. Bike lanes will be incorporated into the design of the downtown couplet segment when funded.

Currently, only Lower Harbor Road, Shopping Center Avenue, W. Benham Lane, and Oceanview Drive have designated bicycle lanes. Bicycle paths exist parallel to US 101 from Harris Beach to Crissey Circle and along Railroad Street from Wharf Street to Oak Street. Although there are no designated bicycle lanes on US 101 in Brookings, the entire segment of US 101 in Curry County is classified as a bicycle route in ODOT's Oregon coast Bike Route Map. Generally, sufficient shoulder space is available for

cyclists to travel safely on US 101. However, in high traffic volume conditions with a significant number of trucks in the traffic stream, safety becomes a concern for bicyclists.

Bicycle parking is generally lacking in Brookings. 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 Brookings 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).

Transportation Demand Management Plan

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

In Brookings, where traffic volumes are low and the population and employment is small, implementing TDM strategies is not practical in most cases. However, the sidewalk improvements recommended earlier in this chapter are also considered TDM strategies. By providing these facilities, the City of Brookings is encouraging people to travel by other modes than the automobile. In rural communities, TDM strategies include providing mobility options.

Because intercity commuting is a factor in Curry County, residents who live in Brookings and work in other cities should be encouraged to carpool with a fellow coworker or someone who works in the same area. Implementing a local carpool program in Brookings alone is not practical because of the city's small size; however, a county-wide carpool program is possible. The City of Brookings should support state and county carpooling and vanpooling programs that could further boost carpooling ridership.

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

Public Transportation Plan

Currently, Greyhound operates the only inter-city bus service to the south. Greyhound provides two northbound and two southbound buses along US 101 between Portland, Oregon and San Francisco, California. This service stops in Port Orford, Gold Beach and Brookings. Local inter-city service is also available connecting Brookings with Gold Beach, Port Orford, and Bandon in Coos County. Connections are available in Bandon to Coos Bay. Local para-transit service is available through the senior citizen centers in Brookings, Port Orford and Gold Beach. Although the service is open to the general public, it predominantly transports elderly and disabled people. In FY 1997 the Brookings Senior Center provided 17,556 trips of which about 74 percent were for elderly and disabled people. As the retirement population in the Brookings-Harbor area increases, additional transit service will be needed to serve the retirement community.

Transit providers indicate there is excess capacity; drivers and vehicles are idle at times. Service could be expanded to serve the general population and to provide some inter-city service without the acquisition of new vehicles. Transit providers are already transporting about two handicapped people a week between Brookings and Gold Beach or Crescent City, California. They report that when other people who are not handicapped hear about the service, they express interest.

The Curry County transit advisory board, consisting of nine members who either use existing service or represent clients who use the service, has completed a transit feasibility study and transit plan. According to the plan, about 90 percent of all County residents live within one or two miles of US 101 and can easily access service that travels between communities in the county and Bandon on this highway. The Plan calls for this service to be expanded to include two or three round-trips a day between the two counties. If this service is to be successful, it is important that it be widely marketed and scheduled to meet the demands of the general public which might be different from those of the elderly and disabled. Marketing should include partnerships with local businesses to advertise both bus service and business services. Also key to a successful program is consistency; people must be able to count on this service so that they may make plans with certainty.

To be successful, this service will require about 20 bus shelters placed several miles apart along US 101. Ideally these bus shelters should be placed near a public use such as a shop, restaurant, or church and have available parking. Currently, no plan exists for exact placement of these shelters or for funding. Curry County transit will continue to seek state and Federal funds for such facility improvements as well as for some operational costs. The City of Brookings currently does not contribute financially to the operation or improvement of the county transit system. Further, the city does not intend on contributing to the system over the 20-year life of this plan.

Rail Service Plan

Brookings has no rail service.

Air Service Plan

The Brookings Airport is located north of the City of Brookings and east of US 101. An update of the Brookings Airport Master Plan was prepared by Reid Middleton for the Oregon Aeronautics Division of the Oregon Department of Transportation in August 1991.

The report reviews existing facilities, predicts future demands on those facilities, establishes a phased schedule (to 2010) and discusses funding for capital projects that will be needed to meet the projected demand.

The state Continuous Aviation System Plan recommends development of a nonprecision GPS approach at the airport. Other recommendations include an Automatic Surface Observation Station (ASOS) to improve weather reporting capabilities, and a runway extension. The current runway measures 2,900 feet long by 60 feet wide.

There are several projects listed in the FAA's Capital Improvement program (CIP) for Brookings Airport. These include overlaying the existing apron, installing Precision Approval Path Indicators (PAPIs) and Runway End Identifier Lights (REILs), constructing an apron, acquiring aviation easements in the Runway Protection Zone (RPZ), constructing a taxiway to T-hangars, acquiring land for terminal development, installing apron lighting, installing taxiway reflectors, acquiring land for approach, and installing perimeter fencing. These are summarized in Table 7-8 below.

TABLE 7-8
RECOMMENDED AIRPORT PROJECTS

Fiscal Year	Project Description	Priority	Total Costs
2000	Overlay Existing Apron	High	$56,000
2000	Construct Taxiway to T-Hangars	High	$25,000
2000	Acquire Land for Terminal Development	High	$100,000
2000	Install Apron Lighting	High	$6,000
2000	Construct T-Hangars Taxiways	High	$37,000
2000	Install taxiway reflectors	High	$2,000
2000	Acquire Aviation Easement	High	$23,000
2000	Install REIL	High	$11,000
2000	Construct Apron (25 aircraft-9500SY)/Revise Airport Layout Plan	High	$160,000
2000	Install PAPI	High	$35,000
2000	Acquire Land for Approach (RPZ)	High	$23,000
TOTAL COSTS			$478,000

The major potential conflict between continued airport use and off-airport development centers on noise impact. Human reaction to the intrusion of aviation noise is complex and subjective. Several indices have been developed in an attempt to rate the annoyance associated with living and working with aviation noise. In general, these indicators attempt to measure quantitatively the acoustic energy of the sound and relate this to the subjective feelings of loudness, noisiness or annoyance. Measures of the noise environment alone cannot provide accurate prediction of the degree of annoyance that ma be associated with a given level of noise intrusion.

The guidelines established by the Oregon Aeronautics Department for areas of "moderate noise impact" (55 – 65 Dbl) state that most uses in such areas are compatible or conditionally compatible. They do, however, recommend that noise sensitive uses such as schools, hospitals, nursing homes, theater, auditoriums and residential development should have noise insulation installed. However, outside of urban areas, lower background noise levels may result, and airport noise within the 55 Dbl noise contour may be perceived as a problem.

The Brookings Airport is located in an area where there is an only low-density residential use so that noise is not a significant problem.

Pipeline Service Plan

There are currently no pipelines serving Brookings.

Water Transportation Plan

The Port of Brookings is encompasses approximately 42 acres of waterfront property at the mouth of the Chetco River. The Port of Brookings Master Plan (1991) focuses on commercial development, community facilities, sport and commercial fishing, and support services, and identifies major improvements to occur in four phases as funds become available.

Phase One includes the improvement to the central section of the Spine Road, the development of the Harbor Walkway, Central Plaza, an observation area, Beach Loop Road, and commercial site preparation. Phase Two consists of Spine Road development and access reconfiguration , parking lot improvements (including boat launch and sport fishing lot), a pedestrian plaza and walkway, and retail/commercial site preparation. Phase Three includes Spine Road development and parking improvements on the east-side of the Commercial Basin. Phase Four consists of improving and expanding facilities for recreational vehicles (RVs). The following Table 7-9 lists projects and approximate cost estimates associated with the proposed improvements.

TABLE 7-9
RECOMMENDED PORT OF BROOKINGS PROJECTS

Projects	Priority	Local Costs	Total Costs
Public Launch Ramp Redevelopment	High	$400,000	$400,000
Basin II Facility Rehabilitation	High	$374,000	$374,000
Basin I Replacement	High	$2,356,000	$2,356,000
Service and Repair Dock	High	$115,000	$115,000
Total Costs		$3,245,000	$3,245,000

TRANSPORTATION SYSTEM PLAN IMPLEMENTATION PROGRAM

Implementation of the Brookings 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 Brookings to address both existing and emerging transportation issues throughout the urban area in a timely and cost effective manner.

One 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 Brookings 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 and, as appropriate, the ODOT STIP. This integration is important since the Transportation System Plan proposes that both governmental agencies will fund some of the transportation improvement projects.

Model policy and ordinance language that conforms with the requirements of the Transportation Planning Rule is included in Chapter 9. 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.

20-Year Capital Improvement Program

The CIP is shown with the following priorities:

- High Priority (0 to 5 years)
- Medium Priority (5 to 10 years)
- Low Priority (10 to 20 years)

These priorities are based on current need, the relationship between transportation service needs, and the expected growth of the city. The following schedule indicates priorities and may be modified to reflect the availability of finances or the actual growth in population and employment.

Table 7-10 summarizes the CIP projects and Figure 7-6 shows the CIP projects. It lists the projects by type, prioritizes them, and provides cost information. The cost estimates for all the projects listed on the CIP were prepared on the basis of 1998 dollars. These costs include design, construction, and some contingency costs. They are preliminary estimates and generally do not include right-of-way acquisition, water or sewer facilities, adding or relocating public utilities, or detailed intersection design.

Brookings has identified a total of 34 projects in its CIP with a cost of $22,162,000. Twenty-five high priority projects have been identified with a cost of about $19,072,000. However, costs associated with improvements related to developments affecting US 101, both north and couth of the current city limits are not known at this time and are not reflected in the High Priority costs. Six medium priority projects have been identified with a cost of about $2,60,000. This does not include costs of capacity improvements that will be needed in the future on US 101 north of Carpenterville Road and Ransom Ave. Finally, one low priority project has been identified, with a cost of about $530,000.

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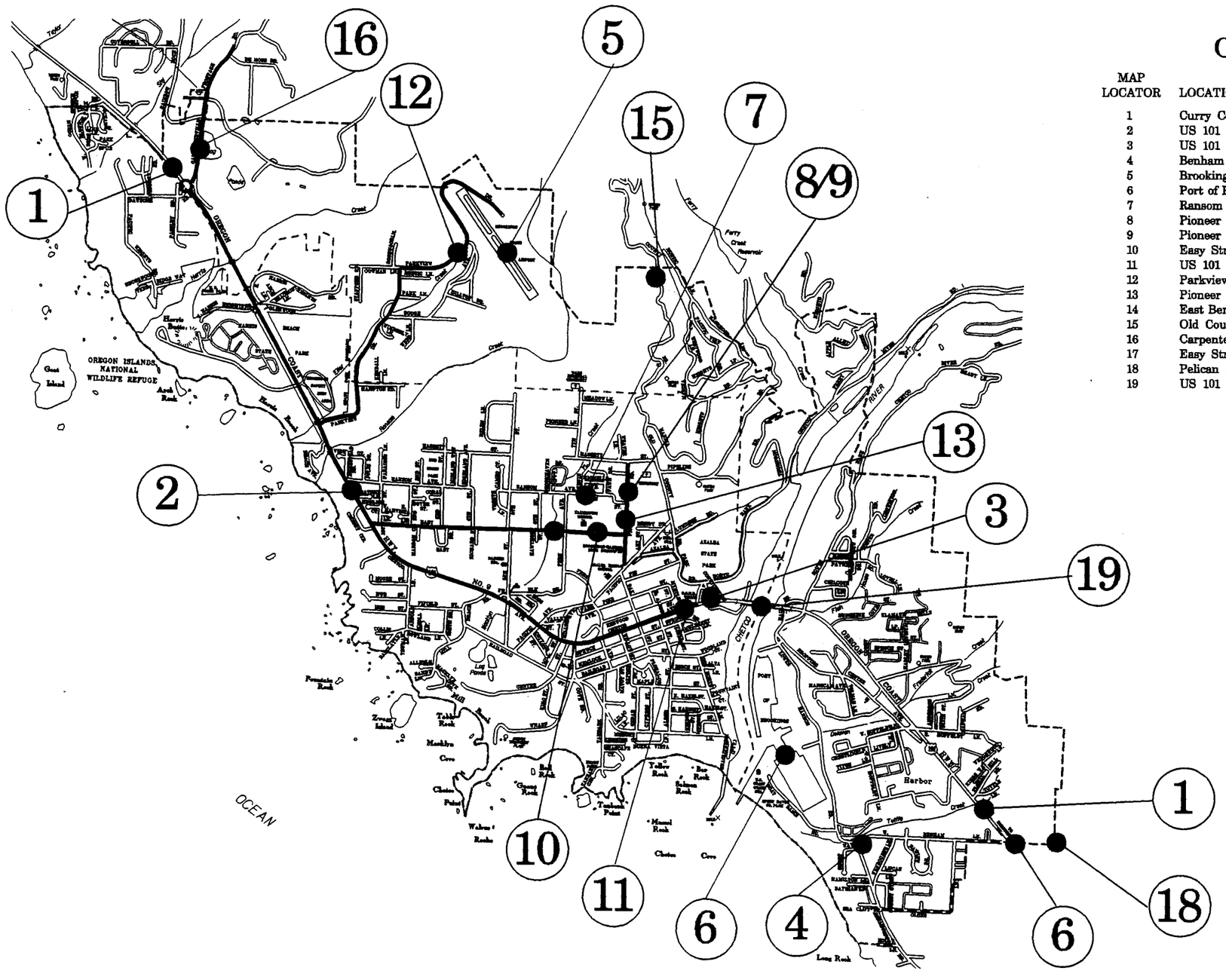
CIP PROJECTS

MAP LOCATOR	LOCATION	PROJECT
1	Curry County	Develop an Alternative Route to US 101
2	US 101	Construct US 101 Couplet
3	US 101	Improve Intersection of Constitution Way and US 101
4	Benham Lane	Improve Intersection of Benham Lane and Ocean View Drive
5	Brookings Airport	Brookings Airport CIP Improvements
6	Port of Brookings	Port of Brookings CIP Improvements
7	Ransom Avenue	Sidewalk Improvements on both sides of roadway
8	Pioneer Road	Sidewalk Improvements on west side of roadway
9	Pioneer Road	Sidewalk Improvements on east side of roadway
10	Easy Street	Sidewalk Improvements on both sides of roadway
11	US 101	Sidewalk Improvements on north side of roadway
12	Parkview Drive	Improve Parkview Drive
13	Pioneer Road	Improve Pioneer Road
14	East Benham Lane	Improve East Benham Road
15	Old County Road	Upgrade Old County Road
16	Carpenterville Road	Upgrade Carpenterville Road
17	Easy Street	Upgrade Easy Street
18	Pelican Bay Drive	Upgrade Pelican Bay Drive
19	US 101	Improve or Replace ODOT Bridge No. 00143D



LEGEND

- UGB
- CITY LIMITS
- ROADWAY & SIDEWALK IMPROVEMENTS

Figure 7–6
IMPROVEMENT PROJECTS
CITY OF BROOKINGS

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TABLE 7-10
PRIORITIZED CAPITAL IMPROVEMENT PROGRAM (1998 DOLLARS)

Project Description	Local Cost	State Cost	Federal Costs	Total Cost
High Priority				
Construct US 101 Couplet	$0	$13,000,000	$0	$13,000,000
Improve intersection of Constitution Way and US 101	$0	$170,000	$0	$170,000
Develop an Alternative Route to US 101	$0	$1,800,000	$0	$1,800,000
Improve Intersection of Benham Lane and Ocean View Drive	$50,000	$0	$0	$50,000
Improve US 101 between Carpenterville Road and Alder Ave	Unknown	Unknown	Unknown	Unknown
Improve US 101/Benham Lane Intersection	Unknown	Unknown	Unknown	Unknown
Improve East-West Connection to I-5	Unknown	Unknown	Unknown	Unknown
Overlay Existing Apron	$0	$0	$56,000	$56,000
Construct taxiway to T-Hangars	$0	$0	$25,000	$25,000
Acquire Land for Terminal Development	$0	$0	$100,000	$100,000
Install Apron Lighting	$0	$0	$6,000	$6,000
Construct T-Hangars Taxiways	$0	$0	$37,000	$37,000
Install taxiway reflectors	$0	$0	$2,000	$2,000
Acquire Aviation Easement	$0	$0	$23,000	$23,000
Install REIL	$0	$0	$11,000	$11,000
Construct Apron/Revise Airport Layout Plan	$0	$0	$160,000	$160,000
Install PAPI	$0	$0	$35,000	$35,000
Acquire Land for Approach (RPZ)	$0	$0	$23,000	$23,000
Public Launch Ramp Redevelopment	$400,000	$0	$0	$400,000
Basin II Facility Rehabilitation	$374,000	$0	$0	$374,000
Basin I Replacement	$2,356,000	$0	$0	$2,356,000
Service and Repair Dock	$115,000	$0	$0	$115,000
Sidewalk on both sides of Ransom Avenue	$149,000	$0	$0	$149,000
Sidewalk on west side of Pioneer Road	$20,000	$0	$0	$20,000
Sidewalk on east side of Pioneer Road	$39,000	$0	$0	$39,000
Sidewalk on both sides of Easy Street	$72,000	$0	$0	$72,000
Sidewalk on north side of US 101	$0	$49,000	$0	$49,000
Medium Priority				
Improve Parkview Drive	$600,000	$0	$0	$600,000
Improve Pioneer Road	$400,000	$0	$0	$400,000
Improve East Benham Lane	$200,000	$0	$0	$200,000
Upgrade Old County Road	$700,000	$0	$0	$700,000
Upgrade Carpenterville Road	$360,000	$0	$0	$360,000
Upgrade Pelican Bay Drive	$300,000	$0	$0	$300,000
Low Priority				
Upgrade Easy Street	$530,000	$0	$0	$530,000
Subtotal High Priority	$3,575,000	$15,019,000	$478,000	$19,072,000
Subtotal Medium Priority	$2,560,000	$0	$0	$2,560,000
Subtotal Low Priority	$530,000	$0	$0	$530,000
Total	$6,665,000	$15,019,000	$478,000	$22,162,000

Curry County, the City of Brookings, the Siskiyou National Forest, and ODOT District 7 expressed interest in a cooperative maintenance agreement concurrent with development of the Transportation System Plan. The work on the maintenance plan was initiated because of an understanding by each agency that maintenance issues extended beyond jurisdictional boundaries. This is of particular

importance in Curry County because a majority of the land area is managed by the US Forest Service and most access into and out of the county is dependent on the state highway system. There was also a realization that forest management activities, such as timber sales, have an impact on the county road system. Because of this interdependence, each of the agencies agreed to prepare a cooperative maintenance agreement. A Memorandum of Understanding for the maintenance plan was drafted and is included in the TSP as Appendix E.

CHAPTER 8: FUNDING OPTIONS AND FINANCIAL PLAN

The Transportation Planning Rule requires Transportation System Plans to evaluate the funding environment for recommended improvements. This evaluation must include a listing of all recommended improvements, estimated costs to implement those improvements, a review of potential funding mechanisms, and an analysis of existing sources' ability to fund proposed transportation improvement projects. Brookings' TSP identifies 32 specific recommendations that address deficiencies, safety issues, or access concerns in addition to revisions to the development ordinance and the development transportation demand management strategies. This section of the TSP provides an overview of Brookings' revenue outlook and a review of some funding and financing options that may be available to the City of Brookings to fund the improvements.

Pressures from increasing growth throughout much of Oregon have created an environment of estimated improvements that remain unfunded. Brookings will need to work with Curry County and ODOT to finance the alternative route and other potential new transportation projects over the 20-year planning horizon. The actual timing of these projects will be determined by the rate of population and employment growth actually experienced by the community. This TSP assumes Brookings will grow at an annual rate of 3.0 percent. If population growth exceeds this rate, the improvements may need to be accelerated. Slower than expected growth will relax the improvement schedule.

HISTORICAL STREET IMPROVEMENT FUNDING SOURCES

In Oregon, state, county, and city jurisdictions work together to coordinate transportation improvements. In addition to this overlapping jurisdiction of the road network, transportation improvements are funded through a combination of federal, state, county, and city sources.

Table 8-1 shows the distribution of road revenues for the different levels of government within the state by jurisdiction level. Although these numbers were collected and tallied in 1991, ODOT estimates that these figures accurately represent the current revenue structure for transportation-related needs.

TABLE 8-1
SOURCES OF ROAD REVENUES BY JURISDICTION LEVEL

	Jurisdiction Level			All
Revenue Source	State	County	City	Funds
State Road Trust	58%	38%	41%	48%
Local	0%	22%	55%	17%
Federal Road	34%	40%	4%	30%
Other	9%	0%	0%	4%
Total	100%	100%	100%	100%

Source: ODOT 1993 Oregon Road Finance Study.

At the state level, nearly half (48 percent in Fiscal Year 1991) of all road-related revenues are attributable to the State Highway Fund (State Road Trust), whose sources of revenue include fuel taxes, weight-mile taxes on trucks, and vehicle registration fees. As shown in the table, the state road trust is a considerable source of revenue for all levels of government. Federal sources (generally the federal highway trust account and federal forest revenues) comprise another 30 percent of all road-related revenue. The remaining sources of road-related revenues are generated locally, including property taxes,

LIDs, bonds, traffic impact fees, road user taxes, general fund transfers, receipts from other local governments, and other sources.

As a state, Oregon generates 94 percent of its highway revenues from user fees, compared to an average of 78 percent among all states. This fee system, including fuel taxes, weight distance charges, and registration fees, is regarded as equitable because it places the greatest financial burden upon those who create the greatest need for road maintenance and improvements. Unlike many states that have indexed user fees to inflation, Oregon has static road-revenue sources. For example, rather than assessing fuel taxes as a percentage of price per gallon, Oregon's fuel tax is a fixed amount (currently 24 cents) per gallon.

Transportation Funding in Curry County

Historically, sources of road revenues for Curry County have included federal grants, state revenues, intergovernmental transfers, interest from the working fund balance, and other sources. Transportation revenues and expenditures for Curry County are shown in Table 8-2 and Table 8-3. These tables present receipts and disbursements for road and street purposes as reported by counties to ODOT.

TABLE 8-2
CURRY COUNTY TRANSPORTATION-RELATED REVENUES

	1993-1994 Actual	1994-1995 Actual	1995-1996 Actual	1996-1997 Actual	1997-1998 Budget
Working Capital	$3,010,002	$2,679,024	$2,101,003	$1,890,500	$2,437,000
Federal Apportionments	$2,164,549	$3,017,444	$2,914,134	$2,810,840	$2,690,000
State Apportionments	$1,204,633	$1,232,304	$1,264,269	$1,211,264	$1,245,000
Local Receipts	$111,995	$182,640	$192,277	$175,930	$156,000
Misc.	$19,737		$13,744	$107,071	$220,000
Misc. Reimbursement	$71,382				$258,000
Fund Transfers	$35,592	$29,789	$62,141	$152,584	$71,288
Sale of Equipment	$23,683		$355		$2,000
Revenue Subtotal	$3,631,571	$4,462,177	$4,446,920	$6,348,189	$4,642,288

Source: Curry County

As shown in Table 8-2, revenues have increased from $3.6 million in 1993-1994 to over $6.3 million in 1996-1997. Approximately $3 million of the annual revenues come from Federal apportionments (mostly Federal Forest receipts). Twenty-five percent of Federal Forest revenue (the 25 percent fund) is returned to the counties based on their share of the total acreage of Federal Forests. Westside forests are subject to the "Owl Guarantee." Intended to protect Spotted Owl habitat, the guarantee also protects the revenue streams from these forests to a maximum three-percent decline annually. The forest in Curry County is the Siskiyou Forest, which is subject to the Owl Guarantee. Another $1.2 million in revenues is from the state highway fund. With a healthy working capital balance, the county has also been able to generate over $100,000 annually in interest and other miscellaneous local receipts. As working capital is the amount carried over from previous years, it is typically reported separately from revenues, which represents the amount of new revenue to the fund each budget year.

TABLE 8-3
CURRY COUNTY TRANSPORTATION-RELATED EXPENDITURES

	1993-1994 Actual	1994-1995 Actual	1995-1996 Actual	1996-1997 Actual	1997-1998 Budget
Personal Services	$1,154,062	$1,124,785	$1,136,899	$1,180,297	$1,263,249
Materials and Services	$1,195,697	$1,062,897	$1,063,999	$1,119,027	$1,246,813
Capital Outlay	$1,484,896	$1,587,206	$880,597	$1,051,041	$1,656,500
Transfers	$127,904	$1,265,310	$829,796	$570,656	$1,688,198
Operating Contingency					$300,000
Expenditure Subtotal	$3,962,559	$5,040,198	$3,911,291	$3,921,021	$6,154,760

Source: Curry County.

As shown in Table 8-3, Curry County has spent between $0.9 million and $1.6 million annually in capital improvements. The county also transfers money to a reserve fund for larger-scale capital improvements. Some transfers are to the general fund to pay for a portion of general overhead attributed to the street fund.

Historical Revenues and Expenditures in the City of Brookings

The City of Brookings accounts for its road-related revenues and expenditures in two separate accounts: the Street Fund and the Street System Replacement Fund. The Street Fund is used to account for the City's State Highway Fund monies, grant funds, and other related revenue. Expenditures against this fund are categorized as personal services, materials and services, and capital outlay. The capital outlay category is desegregated into the sub-categories of equipment and street construction/repair. The amount expended annually for street construction/repair has ranged between a very negligible amount ($91 in 1995/96) to over $74,000 in the year that Brookings benefited from a $34,000 Small Cities Allocation (SCA) grant (in 1994/95). Excluding the SCA grant, the amount spent on street construction/repair from this fund has averaged $16,800 over three fiscal years (1994/95 to 1996/97).

The Street System Replacement Fund is a special fund set up to account for materials and labor relating to specific construction projects. Its revenues are generated by a $2.50 charge on each household's water bill. It has successfully generated revenue in the amount of $80,000 to $88,000 annually for the last several years, and is expected to continue providing stable revenues.

Transportation Revenue Outlook in the City of Brookings

ODOT's policy section recommends certain assumptions in the preparation of transportation plans. In its Financial Assumptions document prepared in May 1998, ODOT projected the revenue of the State Highway Fund through year 2020. The estimates are based on not only the political climate, but also the economic structure and conditions, population and demographics, and patterns of land use. The latter is particularly important for state-imposed fees because of the goals in place under Oregon's Transportation Planning Rule (TPR) requiring a 10-percent reduction in per-capita vehicle miles of travel (VMT) in Metropolitan Planning Organization (MPO) areas by year 2015, and a 20-percent reduction by year 2025.

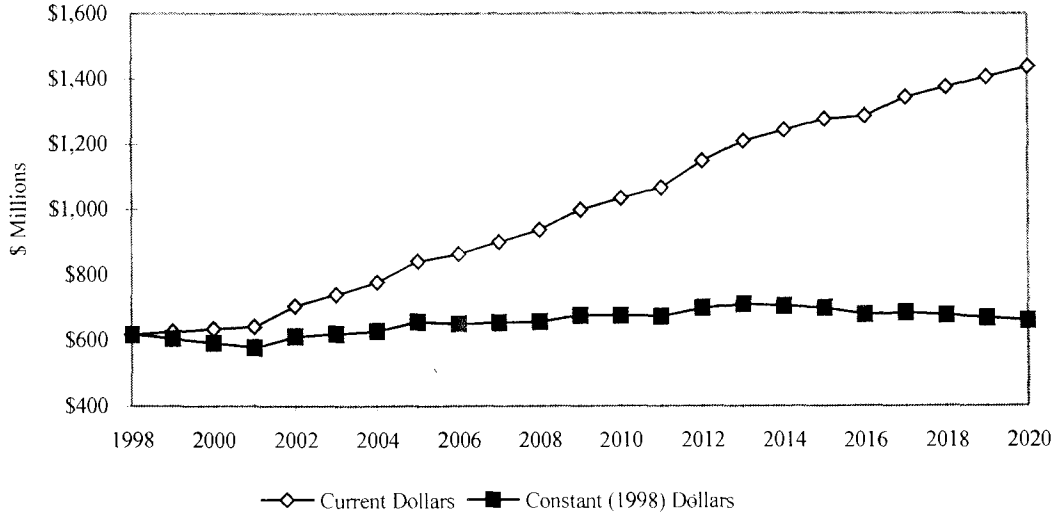
This requirement will affect the 20-year revenue forecast from the fuel tax. ODOT recommends the following assumptions:

- Fuel tax increases of one cent per gallon per year (beginning in year 2002), with an additional one cent per gallon every fourth year;

- Vehicle registration fees would be increased by $10 per year in 2002, and by $15 per year in year 2012;
- Revenues will fall halfway between the revenue-level generated without TPR and the revenue level if TPR goals were fully met;
- Revenues will be shared among the state, counties, and cities on a "50-30-20 percent" basis rather than the previous "60.05-24.38-15.17 percent" basis; and
- Inflation occurs at an average annual rate of 3.6 percent (as assumed by ODOT).

Figure 8-1 shows the forecast in both current-dollar and inflation-deflated constant (1998) dollars. As highlighted by the constant-dollar data, the highway fund is expected to grow slower than inflation early in the planning horizon until fuel-tax and vehicle-registration fee increases occur in year 2002, increasing to a rate somewhat faster than inflation through year 2015, continuing a slight decline through the remainder of the planning horizon.

FIGURE 8-1
STATE HIGHWAY FUND FORECAST



Source: ODOT Financial Assumptions.

As the State Highway Fund is expected to remain a significant source of funding for Brookings' street operations, the city is highly susceptible to changes in the Fund. In recent years, the State Highway Fund has supplied the majority of Brookings' total street fund revenue.

In order to analyze the City's ability to fund the recommended improvements from current sources, DEA applied the following assumptions:

- The State Highway Fund will continue to account for the majority of the City's Street Fund;
- Interest, the Street Replacement Fund, and other local sources continue to provide stable revenue streams; and
- The proportion of revenues available for capital expenditures for street improvements will be a small, but stable, proportion of overall street expenditures.

LEGEND

ALTERNATIVE ROUTES TO US 101

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MILES

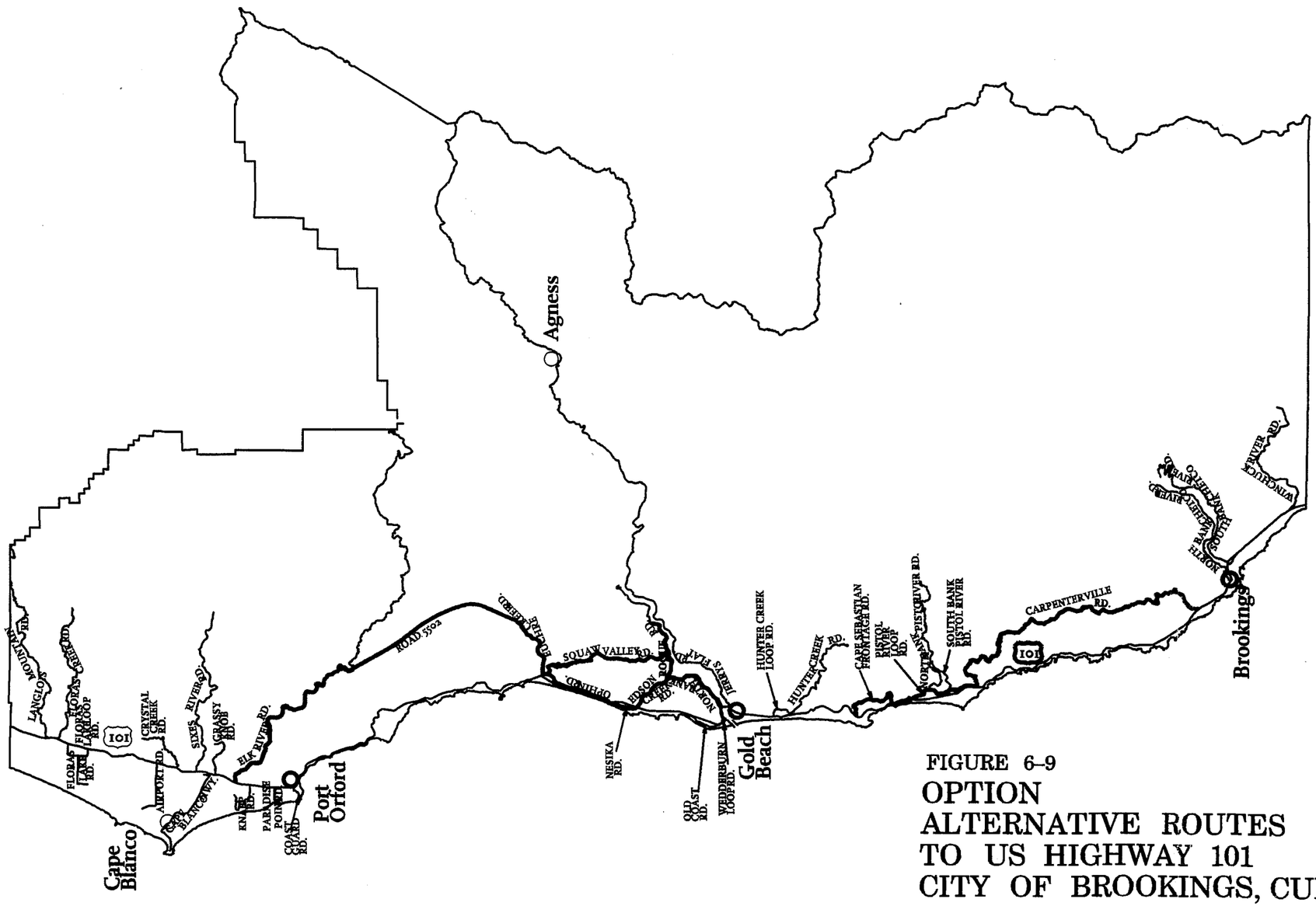

FIGURE 6-9
OPTION
ALTERNATIVE ROUTES
TO US HIGHWAY 101
CITY OF BROOKINGS, CURRY COUNTY

ODOT0221/FIGURES/BROO6-2.DGN/JLSP/10-22-98

Applying these assumptions to the estimated level of the State Highway Fund resources, as recommended by ODOT, resources available to Brookings for all operations, maintenance, and capital outlay purposes are estimated at between $220,000 and $280,000 annually (in current 1998 dollars), as shown in Table 8-4.

TABLE 8-4
ESTIMATED RESOURCES AVAILABLE TO CITY OF BROOKINGS
FROM STATE HIGHWAY FUND, 1998 DOLLARS

Year	Total Estimated Resources from State Highway Fund	Estimated Funds Available for Capital Outlay
1999	$240,000	$99,000
2000	$230,000	$97,000
2001	$220,000	$95,000
2002	$240,000	$100,000
2003	$240,000	$102,000
2004	$240,000	$103,000
2005	$260,000	$107,000
2006	$250,000	$107,000
2007	$250,000	$107,000
2008	$260,000	$108,000
2009	$260,000	$111,000
2010	$260,000	$111,000
2011	$260,000	$110,000
2012	$270,000	$114,000
2013	$280,000	$116,000
2014	$270,000	$115,000
2015	$270,000	$114,000
2016	$260,000	$111,000
2017	$270,000	$112,000
2018	$260,000	$111,000
2019	$260,000	$109,000

The amount actually received from the State Highway Fund will depend on a number of factors, including:

- the actual revenue generated by state gasoline taxes, vehicle registration fees, and other sources; and
- the population growth in Brookings (since the distribution of state highway funds is based on an allocation formula which includes population).

Based on the amount of resources historically available to fund capital improvements this analysis suggests that the City of Brookings will have between $95,000 and $116,000 available annually for capital improvements.

REVENUE SOURCES

In order to finance the recommended transportation system improvements requiring expenditure of capital resources, it will be important to consider a range of funding sources. Although the property tax has traditionally served as the primary revenue source for local governments, property tax revenue goes into general fund operations, and is typically not available for street improvements or maintenance. Despite this limitation, the use of alternative revenue funding has been a trend throughout Oregon as the full implementation of Measures 5 and 47 have significantly reduced property tax revenues (see below). The alternative revenue sources described in this section may not all be appropriate in Brookings; however, this overview is being provided to illustrate the range of options currently available to finance transportation improvements during the next 20 years.

Property Taxes

Property taxes have historically been the primary revenue source for local governments. However, property tax revenue goes into general fund operations, and is not typically available for street improvements or maintenance. The dependence of local governments on this revenue source is due, in large part, to the fact that property taxes are easy to implement and enforce. Property taxes are based on real property (i.e., land and buildings) which has a predictable value and appreciation to base taxes upon. This is as opposed to income or sales taxes that can fluctuate with economic trends or unforeseen events.

Property taxes can be levied through: 1) tax base levies, 2) serial levies, and 3) bond levies. The most common method uses tax base levies that do not expire and are allowed to increase by six percent 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 or the project.

The historic dependence on property taxes is changing with the passage of Ballot Measure 5 in the early 1990s. Ballot Measure 5 limits the property tax rate for purposes other than payment of certain voter-approved general obligation indebtedness. Under full implementation, 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. 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 the 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. The proportional reduction in the tax rate is commonly referred to as compression of the tax rate.

Measure 47, an initiative petition, was passed by Oregon voters in November 1996. It is a constitutional amendment that reduces and limits property taxes and limits local revenues and replacement fees. The measure limits 1997-98 property taxes to the lesser of the 1995-96 tax minus 10 percent, or the 1994-95 tax. It limits future annual property tax increases to three percent, with exceptions. Local governments' lost revenue may be replaced only with state income tax, unless voters approve replacement fees or charges. Tax levy approvals in certain elections require 50 percent voter participation.

The state legislature created Measure 50, which retains the tax relief of Measure 47 but clarifies some legal issues. This revised tax measure was approved by voters in May 1997.

The League of Oregon Cities (LOC) estimated that direct revenue losses to local governments, including school districts, will total $467 million in fiscal year 1998, $553 million in 1999, and increase thereafter. The actual revenue losses to local governments will depend on actions of the Oregon Legislature. LOC also estimates that the state will have revenue gains of $23 million in 1998, $27 million in 1999, and increase thereafter because of increased personal and corporate tax receipts due to lower property tax deduction.

Measure 50 adds another layer of restrictions to those which govern the adoption of tax bases and levies outside the tax base, as well as Measure 5's tax rate limits for schools and non-schools and tax rate exceptions for voter approved debt. Each new levy and the imposition of a property tax must be tested against a longer series of criteria before the collectible tax amount on a parcel of property can be determined.

System Development Charges

System Development Charges (SDCs) are becoming increasingly popular in funding public works infrastructure needed for new local development. Generally, the objective of systems development charges is to allocate portions of the costs associated with capital improvements upon the developments that increase demand on transportation, sewer or other infrastructure systems.

Local governments have the legal authority to charge property owners and/or developers fees for improving the local public works infrastructure based on projected demand resulting from their development. The charges are most often targeted towards improving community water, sewer, or transportation systems. Systems Development Charges must be established through an ordinance or resolution, supported by a capital improvement plan, public facility plan, master plan, or other comparable plan documenting the projects eligible for SDCs and establishing the methodology for calculating the proportionate share.

SDCs are collected when new building permits are issued. Transportation SDCs are based on expected trip generation of the proposed development. Residential calculations would be based on the assumption that a typical household will generate a given number of vehicle trips per day. Nonresidential use calculations are based on employee ratios for the type of business or industrial uses. As a fast-growing community, Brookings currently utilizes transportation SDCs to help fund the infrastructure required to support new development.

State Highway Fund

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 revenue share to cities is divided among all incorporated cities based on population. Like other Oregon cities, the City of Brookings uses its state gas tax allocation to fund street construction and maintenance.

Local Gas Taxes

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 (including the cities of Woodburn and The Dalles and Multnomah and Washington Counties) levy a local gas tax. The City of Brookings may consider implementing a local gas tax as a way to generate additional street improvement funds. However, with relatively few jurisdictions exercising this tax, an increase in the cost differential between gas purchased in Brookings and gas purchased in neighboring communities may encourage drivers to seek less expensive fuel elsewhere. Any action will need to be supported by careful analysis to minimize the unintended consequences of such an action.

Vehicle Registration Fees

The Oregon Vehicle Registration Fee is allocated to the State, counties and cities for road funding. Oregon counties are granted authority to impose a vehicle registration fee covering the entire county. The Oregon Revised Statutes would allow Curry 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 Curry 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. 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 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 applying 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.

GRANTS AND LOANS

There are a variety of grant and loan programs available, most with specific requirements relating to economic development or specific transportation issues, rather than for the general construction of new streets. Many programs require a match from the local jurisdiction as a condition of approval. Because grant and loan programs are subject to change as well as statewide competition, they should not be considered a secure long-term funding source for Brookings. Most of the programs available for transportation projects are funded and administered through ODOT and/or the Oregon Economic Development Department (OEDD). Some programs which may be appropriate for the Brookings are described below.

Bike-Pedestrian Grants

By law (ORS 366.514), all road street or highway construction or reconstruction projects must include facilities for pedestrians and bicyclists, with some exceptions. ODOT's Bike and Pedestrian Program administers two programs to assist in the development of walking and bicycling improvements: local grants, and Small-Scale Urban Projects. Cities and counties with projects on local streets are eligible for local grant funds. An 80 percent state/20 percent local match ratio is required. Eligible projects include curb extensions, pedestrian crossing and intersection improvements, shoulder widening and restriping for bike lanes. Projects on urban state highways with little or no right-of-way taking and few environmental impacts are eligible for Small-Scale Urban Project Funds. Both programs are limited to projects costing up to $100,000. Projects that cost more than $100,000, require the acquisition of ROW, or have environmental impacts should be submitted to ODOT for inclusion in the STIP.

The ODOT Bike and Pedestrian Program can be reached at (503) 986-3555.

Enhancement Program

This federally-funded program earmarks $8 million annually for projects in Oregon. Projects must demonstrate a link to the intermodal transportation system, compatibility with approved plans, and local financial support. A 10.27 percent local match is required for eligibility. Each proposed project is evaluated against all other proposed projects in its region. Within the five Oregon regions, the funds are

distributed on a formula based on population, vehicle miles traveled, number of vehicles registered and other transportation-related criteria. The solicitation for applications was mailed to cities and counties the last week of October 1998. Local jurisdictions have until January 1999 to complete and file their applications for funding available during the 2000-2003 fiscal years, which begin October 1999.

The ODOT Enhancement Program can be reached at (503) 986-3528.

Highway Bridge Rehabilitation or Replacement Program

The Highway Bridge Rehabilitation or Replacement Program (HBRR) provides federal funding for the replacement and rehabilitation of bridges of all functional classifications. A portion of the HBRR funding is allocated for the improvement of bridges under local jurisdiction. A quantitative ranking system is applied to the proposed projects based on sufficiency rating, cost factor, and load capacity. They are ranked against other projects statewide, and require state and local matches of 10 percent each. It includes the Local Bridge Inspection Program and the Bridge Load Rating Program.

The ODOT Highway Bridge Rehabilitation or Replacement Program can be reached at (503) 986-3344.

Transportation Safety Grant Program

Managed by ODOT's Transportation Safety Section (TSS), this program's objective is to reduce the number of transportation-related accidents and fatalities by coordination a number of statewide programs. These funds are intended to be used as seed money, funding a program for three years. Eligible programs include programs in impaired driving, occupant protection, youth, pedestrian, speed, enforcement, bicycle and motorcycle safety. Every year, TSS produces a Highway Safety Plan that identifies the major safety programs, suggests countermeasures to existing safety problems, and lists successful projects selected for funding, rather than granting funds through an application process.

The ODOT Transportation Safety Grant Program can be reached at 986-4192.

Special Transportation Fund

The Special Transportation Fund (STF) awards funds to maintain, develop, and improve transportation services for people with disabilities and people over 60 years of age. Financed by a two-cent tax on each pack of cigarettes sold in the state, the annual distribution is approximately $5 million. Three-quarters of these funds are distributed to mass transit districts, transportation districts, and where such districts do not exist, counties, on a per-capita formula. The remaining funds are distributed on a discretionary basis.

The ODOT Special Transportation Fund can be reached at (503) 986-3885.

Special Small City Allotment Program

The Special Small City Allotment Program (SCA) is restricted to cities with populations under 5,000 residents. Unlike some other grant programs, no locally funded match is required for participation. Grant amounts are limited to $25,000 and must be earmarked for surface projects (drainage, curbs, sidewalks, etc.). However, the program does allow jurisdictions to use the grants to leverage local funds on non-surface projects if the grant is used specifically to repair the affected area. Criteria for the $1 million in total annual grant funds include traffic volume, the five-year rate of population growth, surface wear of the road, and the time since the last SCA grant. In Curry County, Port Orford has benefited from a grant from this program in 1995-96. Although Brookings received a grant under this program in 1994-95, Brookings' population was most recently estimated at 5,440 (1997), making Brookings too large to remain eligible for this program.

The ODOT Special City Allotment Program can be reached at (503) 986-3893.

Immediate Opportunity Grant Program

The Oregon Economic Development Department (OEDD) and ODOT collaborate to administer a grant program designed to assist local and regional economic development efforts. The program is funded to a level of approximately $7 million per year through state gas tax revenues. The following are primary factors in determining eligible projects:

- Improvement of public roads;
- Inclusion of an economic development-related project of regional significance;
- Creation or retention of primary employment; and
- Ability to provide local funds (50/50) to match grant.

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, the City of Hermiston, Port of St. Helens, and the City of Newport.

The ODOT Immediate Opportunity Fund program can be reached at (503) 986-3463.

Oregon Special Public Works Fund

The Special Public Works Fund (SPWF) program was created by the 1995 State Legislature as one of 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, water supply works, public roads, and transportation facilities.

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. Jurisdictions that have received SPWF funding for projects that include some type of transportation-related improvement include the Cities of Baker City, Bend, Cornelius, Forest Grove, Madras, Portland, Redmond, Reedsport, Toledo, Wilsonville, Woodburn, and Douglas County.

The Oregon Special Public Works Fund can be reached at (503) 986-0136.

Oregon Transportation Infrastructure Bank

The Oregon Transportation Infrastructure Bank (OTIB) program is a revolving loan fund administered by ODOT to provide loans to local jurisdictions (including cities, counties, special districts, transit districts, tribal governments, ports, and state agencies). Eligible projects include construction of federal-aid highways, bridges, roads, streets, bikeways, pedestrian accesses, and right-of-way costs. Capital Outlays such as buses, light-rail cars and lines, maintenance years and passenger facilities are also eligible.

The Oregon Transportation Infrastructure Bank can be reached at (503) 986-3922.

Oregon Ports Division, Oregon Economic Development Department

The Oregon Ports Division provides technical, financial, and intergovernmental coordination assistance to ports to help them develop facilities that aid the efficient shipping of products and improve the local economy. It includes three financial assistance programs to finance port infrastructure development and

port-related business development projects, planning for business operations and facilities development, marketing port facilities and services, and navigation projects.

The Oregon Ports Division can be reached at (503) 986-0243.

ODOT Funding Options

The State of Oregon provides funding for all highway related transportation projects through the Statewide Transportation Improvement Program (STIP) which is adopted by the OTC and administered by ODOT. The STIP outlines funding and schedules for ODOT projects throughout the State. The STIP, which identifies projects for a four-year funding cycle, is updated every two years. 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 TEA-21 planning requirements. The STIP must fulfill federal planning requirements for a staged, multi-year, statewide, intermodal program of transportation projects. Specific transportation projects are prioritized based on federal planning requirements and the different State plans. ODOT consults with local jurisdictions before highway related projects are added to the STIP. Further, all projects to be forwarded to the OTC for consideration for the STIP must first be recommended by the Southwest Area Commission on Transportation (SWACT), a body commissioned by the OTC to provide regional support for transportation improvement projects.

The highway-related projects identified in Brookings' TSP will be considered for future inclusion on the STIP. The timing of including specific projects will be determined by ODOT and the SWACT based on an analysis of all the project needs within Region 3. The City of Brookings, Curry 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. In addition, the city's active participation in the SWACT process is essential for advancement of local projects to the STIP.

ODOT also has the option of making some highway improvements as part of their ongoing highway maintenance program. Types of road construction projects that can be included within the ODOT maintenance programs are intersection realignments, additional turn lanes, and striping for bike lanes. 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 Brookings' TSP 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.

Financing Tools

In addition to funding options, the recommended improvements listed in this plan may benefit from a variety of financing options. Although often used interchangeably, the words financing and funding are not the same. Funding is the actual generation of revenue by which a jurisdiction pays for improvements, some examples include the sources discussed above: property taxes, SDCs, fuel taxes, vehicle

registration fees, LIDs, and various grant programs. In contrast, financing refers to the collecting of funds through debt obligations.

There are a number of debt financing options available to the City of Brookings. The use of debt to finance capital improvements must be balanced with the ability to make future debt service payments and to deal with the impact on its overall debt capacity and underlying credit rating. Again, debt financing should be viewed not as a source of funding, but as a time shifting of funds. The use of debt to finance these transportation-system improvements is appropriate since the benefits from the transportation improvements will extend over the period of years. If such improvements were to be tax financed immediately, a large short-term increase in the tax rate would be required. By utilizing debt financing, local governments are essentially spreading the burden of the costs of these improvements to more of the people who are likely to benefit from the improvements and lowering immediate payments.

General Obligation Bonds

General Obligation (GO) bonds are voter-approved bond issues which 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 debt is paid off. The property tax levy is distributed equally throughout the taxing jurisdiction according to assessed value of property. General obligation debts typically are 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 real market value of all taxable property in the city. Since general obligation bonds would be issued subsequent to voter approval, they would not be restricted to the limitations set forth in Ballot Measures 5, 47, and 50. Although new bonds must be specifically voter approved, Measure 47 and 50 provisions are not applicable to outstanding bonds, un-issued voter-approved bonds, or refunding bonds.

Limited Tax 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, the limited tax bond represents a higher borrowing cost than general obligation bonds. The municipality must pledge to levy the maximum amount under constitutional and statutory limits, but not the unlimited taxing authority pledged with GO bonds. Because LTGOs are not voter approved, they are subject to the limitations of Ballot Measures 5, 47, and 50.

Bancroft Bonds

Under Oregon Statute, municipalities are allowed to issue Bancroft bonds which pledge the city's full faith and credit to assessment bonds. As a result, the bonds become general obligations of the city but are paid with assessments. Historically, these bonds provided a city with the ability to pledge its full faith and credit in order to obtain a lower borrowing cost without requiring 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 Measures 5, 47, and 50. As a result, since 1991, Bancroft bonds have not been used by municipalities who were required to compress their tax rates.

Funding Requirements

Brookings' TSP identifies both capital improvements and strategic efforts recommended during the next 20 years to address safety and access problems and to expand the transportation system to support a growing population and economy. They have been classified within three priority levels:

- Short-Range: within the next five years;
- Intermediate-Range: between year six and year 10; and
- Long-Range: after year 10.

The projects include 26 high-priority projects, totaling an estimated $15.6 million, seven medium-priority projects estimated to total about $2.5 million, and one low-priority project, estimated to cost $530,000 million. Total estimated costs, listed by financial leader and priority level, are shown in Table 8-5.

TABLE 8-5
RECOMMENDED PROJECTS AND FINANCIAL RESPONSIBILITY

	Local Cost	State Cost	Federal Cost	Total Cost
Subtotal High Priority	$3,575,000	$15,019,000	$478,000	$19,072,000
Subtotal Medium Priority	$2,560,000	$0	$0	$2,60,000
Subtotal Low Priority	$530,000	$0	$0	$530,000
Total	$6,665,000	$15,019,000	$478,000	$22,162,000

Although this preliminary analysis shows a potential revenue surplus, this surplus is based on a review of existing funding sources and projects identified at this time. It is likely that new projects requiring additional resources will arise during this TSP's 20-year planning horizon.

The projects have been categorized by their intended financial leader. As noted in Table 8-5, the city will be responsible for projects totaling just over $6.6 million in estimated cost, with nine projects totaling over $3.5 million in the first five years, six projects estimated to cost just over $2.5 million in the next five years, and one project estimated to cost $530,000 in the next 10 years. Based on the resources available as estimated in Table 8-4, the City of Brookings is expected to experience a budget deficit, as shown in Table 8-6.

TABLE 8-6
ESTIMATED CAPITAL FUNDING BALANCE

	Years 0-5	Years 6-10	Years 11-20
Available	$492,000	$526,000	$1,342,000
Needed for city-funded projects	$3,575,000	$2,560,000	$530,000
Surplus (Deficit)	($3,083,000)	($2,034,000)	$812,000
Cumulative Surplus (Deficit)	($3,083,000)	($5,117,000)	($4,305,000)

Of the nearly $3.6 million in city-funded projects classified as high-priority projects, over $3.2 million are Port of Brookings projects. The City of Brookings will need to work with the Port and the Oregon Ports Division to finance these port infrastructure projects. As described earlier in this chapter, the Oregon Ports Division of OEDD manages three financial assistance programs to finance port infrastructure development and port-related business development projects, planning for business

operations and facilities development, marketing port facilities and services, and navigation projects. The other projects classified as high-priority are primarily sidewalk projects, which may be eligible for bike and pedestrian funds, described earlier in this chapter.

The six projects classified as medium-priority projects include improving Parkview Drive, adding lanes to Pioneer Road and East Benham Lane, and upgrading Old County Road, Carpenterville Road, Easy Street, and Pelican Bay Drive to collector status. Adding lanes increases the capacity of roadways, making such improvements eligible for SDC funding. At this time, the City of Brookings is looking to SDCs to fund approximately 45 percent of SDC-eligible projects. In addition, the improvements to Parkview Drive may be eligible for OEDD funding, as this roadway serves as the primary access to the airport.

This TSP identifies 34 projects recommended for Brookings' planning area over the 20-year planning horizon. The City of Brookings is expected to experience a budget deficit between the projects planned and the projects for which the City has a financial role. This budget deficit begins in the first five years of the planning horizon, increases in the second five years, and then decreases over the last ten years of the planning horizon. The City of Brookings will need to work with Curry County, ODOT, and OEDD to fund the other projects identified in this transportation system plan.

In addition, cost for improvements that are needed to mitigate new development which impacts the roadway system must be shared between jurisdictions responsible for the roadway and the developer causing a degradation of service along that roadway. To address this issue, any Traffic Impact Study required to determine the impacts of land use changes will include estimated costs for the required mitigation, as well as a determination of the equitable sharing of costs among all responsible parties.

APPENDIX A

REVIEW OF EXISTING PLANS AND POLICIES

APPENDIX A

REVIEW OF EXISTING PLANS AND POLICIES
CITY OF BROOKINGS

BROOKINGS COMPREHENSIVE PLAN

The Brookings Comprehensive Plan was adopted in September 1981. According to the Plan, the City of Brookings has been involved in land use processes and controls in one form or another since the early 1900s. A zoning code was adopted in 1952 and the first Comprehensive Plan was adopted in 1963 and revised in 1970. Most of the planning for these documents was the responsibility of the elected and appointed officials in Brookings. As a result of the formation of the Department of Land Conservation and Development, the City revisited its land use policies and implementing tools.

The Plan contains eighteen goals:

1. Citizen Involvement
2. Land Use Planning
3. Agricultural Lands
4. Forest Lands
5. Open Spaces, Scenic and Historic Areas and Natural Resources
6. Air, Water and Land Resource Quality
7. Areas Subject to Natural Disasters and Hazards
8. Recreational Needs
9. Economy of the State
10. Housing
11. Public Facilities and Services
12. Transportation
13. Energy Conservation
14. Urbanization
15. Willamette Greenway (Not Included)
16. Estuarine Resources
17. Coastal Shorelands
18. Beaches and Dunes

For each goal, the Plan lists findings, policies, and implementation measures. Goal 12 specifically addresses transportation.

Goal 12: Transportation

Goal: To provide and encourage a safe, convenient and economic transportation system.

The findings for Goal 12 describe some of the existing transportation facilities in the late 1970s and early 1980s. The findings note that the condition of the roads and streets was poor and maintenance costs high. The plan also states that access to businesses and private residences next to Highway 101 is direct from the highway.

More air service linking Brookings with other cities was needed. The 14-foot channel in the Chetco Estuary allowed navigation by barges and tugs only at high tide and during daylight hours.

Policies:

The city will develop a system of streets that provides adequate access to all property in terms of utilities and fire and police protection. The downtown business district will be made more accessible to vehicular and pedestrian traffic and street patterns will be developed which discourage a high-speed vehicular traffic and noise in residential areas.

The City will encourage improvement to airport facilities and assure that airport approach zones are protected, by coordinating development in the Brookings Urban Growth Boundary and Area of Mutual Interest with the State of Oregon and Curry County in accordance with the Brookings State Airport Master Plan.

The City will develop a traffic circulation system which allows adequate access to industrial land.

Brookings will encourage the development of additional port facilities and support facilities.

The City will make provision for foot traffic in residential areas and provide bike paths and walkways in appropriate areas.

Brookings will examine the need for and the feasibility of public transit and will encourage programs which meet the needs of transportation disadvantaged.

On a regional level, the City of Brookings encourages reduction in the regions general isolation from the rest of Oregon, improvement of intra-regional transportation, construction of passing lanes and realignments on the entire length of Highway 101 and construction of the underpass of Highway 101 at the south end of the Chetco River Bridge.

CITY OF BROOKINGS LAND DEVELOPMENT CODE

The City of Brookings Land Development Code was adopted in April 1989. The Land Development Code contains 42 sections that establish zoning designations, permit procedures, sign regulations, non-conforming uses, conditional uses, variances, amendments and annexations and other regulations pertaining to land use. The sections that relate to transportation issues are Section 92, Off-Street Parking and Loading Regulations and Section 172: Public Facilities Improvement Standards and Criteria. Section 172 has regulations concerning street standards, neighborhood circulation, sidewalks, bicycle routes, and driveway approaches.

BROOKINGS STATE AIRPORT MASTER PLAN UPDATE

The Brookings Airport Master Plan Update was prepared by Reid Middleton for the Oregon Aeronautics Division of the Oregon Department of Transportation in August 1991. The purpose of the document was to provide long-range guidance for the development of airfield facilities, forecast future levels of aeronautical acitivty, offer an assessment of future capital projects, identify funding, and promote planning for compatibility between the airport and the community.

The document consists of the following six chapters:

Chapter I: Introduction and Background
Chapter II: Aviation Demand Forecasts
Chapter III: Demand/Capacity and Facility Requirements
Chapter IV: Altenrative Assessment Summary
Chapter V: Plans and Implementation
Chapter VI: Aircraft Noise and Land Use

As can be seen from the chapter titles, the report reviews existing facilities, predicts future demands on those facilities, and establishes a phased schedule (to 2010) and discusses funding for capital projects that will be needed to meet the projected demand.

PORT OF BROOKINGS HARBOR MASTER PLAN (Revised 1991)

The Master Plan was prepared by the consultant team of The Benkendorf Associates and ECO Northwest and published in March 1991. The purpose of the Master Plan was to guide land use and development decisions for the Port of Brookings Harbor, focusing on the industries of sport and commercial fishing and support services, visitor-related commercial development, and community facilities.

The Plan consists of six chapters:

I. Introduction
II. Site Analysis
III. Market Analysis
IV. Master Plan
V. Phasing and Implementation
VI. Appendixes

Only one vehicular circulation improvement is noted in the Master Plan: an interior access road to run north-south from the sport basin to Lower Harbor road near the commercial basin. This road is intended to facilitate access to waterfront areas, relieve traffic from Lower Harbor Road and provide definition to the developed and open areas. It will also be one of the corridors for pedestrian circulation.

APPENDIX B

1996 MAJOR STREETS INVENTORY

APPENDIX B
1996 MAJOR STREETS INVENTORY
City of Brookings Transportation System Plan

Street Segment	Jurisdiction	Classification	Speed Limit	Pavement Width	Lane Widths	Number of Lanes	On-Street Parking	Sidewalks	Bike Lanes	Pavement Condition
US 101										
Harris Beach Park to Crissey Circle	State	primary arterial	45 mph	32-36	12	2	no	no	west side	
Crissey Circle to Pacific Avenue	State	primary arterial	35 mph	58-68	12	4	yes	yes	no	
Pacific Avenue to Constitution Way	State	primary arterial	25 mph	62-78	12	4	yes	yes	no	
Constitution Way to Benham Lane	State	primary arterial	35-45 mph	72-84	12	4	no	south side	no	
Benham Lane to McVay Lane Frontage Road	State	primary arterial	55 mph	72-84	12	4	no	no	no	
McVay Lane Frontage Road to OR-CA Border	State	primary arterial	55 mph	46-50		2	no	no	no	
US 101 to Carpenterville Road	State	primary arterial	35 mph	22-24	11	2	no	no	no	
Carpenterville Frontage Road										
US 101 to Cape Ferrelo Road	County	local?	40 mph	20	10	2	no	no	no	
North Bank Chetco River Road										
Constitution Way to east project boundary	County	collector	40 mph	26	12	2	no	no	no	
South Bank Chetco River Road										
north of US 101 to Harbor View	County	collector	35 mph	34	12	2	no	west side	yes	
Harbor View to east project boundary	County	collector	35 mph	24	12	2	no	no	no	
Easy Street										
US 101 to Fern Avenue	City	collector	25 mph	21	10	2	no	south side	no	
Fern Avenue to Pioneer Road	City	collector	25 mph	38	11	2	yes	no	no	
Lower Harbor Rd										
US 101 to W. Benham Lane	County	collector	35 mph	40-47	12	2-3	no	west side	yes	
West Benham Lane										
Lower Harbor Road to US 101	County	collector	35 mph	30	12	2	no	yes	yes	

APPENDIX B
1996 MAJOR STREETS INVENTORY
City of Brookings Transportation System Plan

Street Segment	Jurisdiction	Classification	Speed Limit	Pavement Width	Lane Widths	Number of Lanes	On-Street Parking	Sidewalks	Bike Lanes	Pavement Condition
Shopping Center Avenue										
Lower Harbor Road to Hoffedlt Lane	County	collector	35 mph	32-46	12	2-3	no	south side	yes	
Oceanview Drive										
West Benham Lane to Cedar Lane	County	collector	35 mph	28	10	2	no	no	yes	
Cedar Lane to US 101		collector	40 mph	28	10	2	no	no	yes	
Hillside										
US 101 to Pacific Avenue	City	collector	25 mph	24	12	2	no	no	no	
Pacific Avenue										
Hillside to Fern Avenue	City	local	25 mph	24	12	2	no	no	no	
Azalea Park Road										
Pacific Avenue to Old County Road	City	collector	25 mph	34	12	2	yes	south side	no	
Old County Road										
Azalea Park Road to Constitution Way	County	local	35 mph	21-24	10	2	no	no	no	
Constitution Way										
Old County Road to US 101	City	collector	25 mph	26	12	2	no	no	no	
Center Street										
US 101 to Railroad Street	City	local	25 mph	47	12	2	yes	yes	no	
Railroad Street										
Pacific Ave to Center Street	City	collector	25 mph	43	12	2	yes	yes	no	
Center St to Wharf Street	City	collector	25 mph	25	12	2	yes	no	no	
Oak St to Del Norte Lane	City	collector	25 mph	22-25	11	2	no	north side (intermittent)	no	

APPENDIX B
1996 MAJOR STREETS INVENTORY
City of Brookings Transportation System Plan

Street Segment	Jurisdiction	Classification	Speed Limit	Pavement Width	Lane Widths	Number of Lanes	On-Street Parking	Sidewalks	Bike Lanes	Pavement Condition
Memory Lane										
Wharf Street to Del Norte Lane	City	collector	25 mph	20-24	10-11	2	no	no	no	
Del Norte Lane										
Memory Lane to Railroad Street	City	collector	25 mph	20-22	10-11	2	no	no	no	
Pioneer Road										
Easy Street to Pacific Avenue	City	collector	25 mph	50	12	2	yes	west side	no	
Oak Street										
Pacific Ave to US 101	City	collector	25 mph	41	12	2	yes	yes	no	
US 101 to Railroad Street	City	collector	25 mph	24	12	2	no	no	no	

APPENDIX C

POTENTIAL DEVELOPMENT IMPACT ANALYSIS

POTENTIAL DEVELOPMENT IMPACT ANALYSIS

Draft Report

CURRY COUNTY

March 1996

Prepared for:

Oregon Department of Transportation
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TABLE OF CONTENTS

1.1 INTRODUCTION

This Potential Development Impact Analysis (PDIA) report provides development estimates for a maximum development scenario in Curry County. All land outside of urban growth boundaries (UGBs) zoned for residential, commercial, and industrial uses was analyzed. The analysis was designed to assist ODOT in answering the question, "How many vehicle trips would be produced if every vacant parcel of residential, commercial, and industrial property in the County was developed at maximum density?" The following development figures were estimated in the analysis:

- The total number of acres zoned for residential, commercial and industrial uses;
- The portion of residential, commercial, and industrial acres that are vacant (buildable);
- The number of existing residential units;
- The number of buildable residential units; and
- The amount of leasable commercial square footage.

Analysis Limitations are outlined in Section 1.2, and Findings are presented in Section 1.3. Appendix A contains a Methodology summary, as well as the Development Standards used in the analysis. Appendix B is comprised of three Spreadsheet Tables which contain the analysis data figures.

1.2 ANALYSIS LIMITATIONS

This analysis was intended to provide a maximum development scenario for residential, commercial, and industrial land in the county. Because low density development is common, the development estimates provided in this report likely overestimate the actual development that will occur.

The development estimates presented in this report were calculated based on a number of assumptions and limitations which are summarized below:

1.2.1 Residential Development Estimate Limitations

- We made allowances for parking requirements and design standards, but because of the high cost of aerial photographs, we did not make allowances for extreme slopes, bodies of water, riparian areas, and other features which constrain development. Therefore, the vacant residential acres figure may overstate the amount of buildable residential acreage, and the potential buildable units figure may overstate the number of residential units that are buildable.

- In order to estimate the existing number of units in residential zones, we summed the number of units for each census block that contains residential zones. The assumption is that most of the units that the Census tallies for a block containing residential zoning actually occur within the residential zone, rather than within non-residential zones.

- Residential units that occur in a census block that does not contain residential zoning were not added into the existing residential units figure.

- The development estimates do not account for market factors, such as the supply of available housing and demand for that housing, that affect residential development. Market demand for housing is related to a number of factors, including employment and income trends, that are not considered in this analysis.

1.2.2 Commercial Development Estimate Limitations

- We determined that any land that was not built upon and did not have physical constraints was developable. We did not consult tax assessor lot lines to determine if a lot was already improved. Since lots with vacant land that are improved are less likely to have future development, the vacant commercial acreage estimate may be overstated.

- In cases where the zoning ordinance does not specify parking requirements for a commercial zoning designation, a parking requirement allowance cannot be calculated. Therefore, the maximum leasable commercial square footage may be overstated.

- Because we could not accurately determine the height of existing buildings or predict future building heights, we assumed that all existing and future commercial development is and will be one-story high.

1.2.3 Industrial Development Estimate Limitations

- The industrial development estimates are expressed as total industrial acreage and vacant industrial acreage. Maximum leasable square feet per acre was not calculated for industrial zones. The main reason for this is that many trip generation models for industrial development use "trips per employee" to estimate trips, rather than using density or leasable square feet per acre. Calculating trips per employee is beyond the scope of this analysis.

- We determined that any land that was not built upon and did not have physical constraints was developable. We did not consult tax assessor lot lines to determine if a lot was already improved. Since lots with vacant land that are improved are less likely to have future development, the vacant industrial acreage estimate may be overstated.

1.3 FINDINGS

This section summarizes the development estimates presented in the Appendix B spreadsheet tables.

1.3.1 Residential Development Estimates

Approximately 9,016 acres of land is zoned residential with 4,038 existing residential units. Of this residential acreage, approximately 1,707 acres are vacant with a potential buildout of 443 units. Maximum development (existing plus potential) is estimated at 4,442 units.

1.3.2 Commercial Development Estimates

Approximately 927 acres of land is zoned commercial. Of this commercial acreage, an estimated 586 acres are vacant, which translates into 9,790,739 square feet of leasable commercial space.

1.3.3 Industrial Development Estimates

Approximately 218 acres are zoned industrial. Of this industrial acreage, an estimated 120 acres are vacant.

APPENDIX A
METHODOLOGY AND DEVELOPMENT STANDARDS

Appendix A contains a description of the project methodology, as well as a detailed description of the Development Standards.

A-1 METHODOLOGY

We established the following six chronological phases for the county analysis:

Phase I:	Data Gathering and Development Standards
Phase II:	Initial Map Analysis
Phase III:	Polygon Map
Phase IV	Commercial/Industrial Aerial Analysis
Phase V:	Data Entry
Phase VI:	Final Report

In Phase I, we compiled the materials necessary to begin the analysis. This process involved reading the county zoning ordinance to determine which zones needed to be analyzed, and interpreting zone descriptions in order to write the Development Standards that are presented in Section A-2.

In Phase II, we studied zoning maps to identify all lands within the county, outside of incorporated urban areas, zoned for residential, commercial, and industrial use. We compared the zoning maps to U.S. Census maps to identify all the census blocks within the residential, commercial, and industrial polygons. We identified the census block acreage and the number of residential units within each census block using 1990 U.S. Census Data. We calculated the amount of acreage within each residential, commercial, and industrial polygon using a grid transparency measuring system. All this data was recorded on data sheets.

In Phase III, we created a polygon map that links each block in the spreadsheet to its location on the county map. This process involved drawing zoning polygons found on individual zoning maps onto a map of the county and assigning each data sheet entry a polygon descriptor number. The creation of the polygon map served as an important accuracy check of the work completed in Phase II, since each data sheet entry had to be reviewed. Polygons comprised solely of residential zoning were labeled "R." Polygons comprised solely of commercial zoning were labeled "C." Polygons comprised solely of industrial zoning were labeled "I." Polygons comprised of two or more of the three zoning classes were labeled "M" if the zoning classes could not be labeled separately.

In Phase IV, we completed an aerial analysis of commercial and industrial lands. For each commercial and industrial data sheet entry, we used a grid transparency to determine the amount of land that was vacant (buildable). The aerial analysis served as a second accuracy check step for the commercial and industrial data sheet entries completed in Phase II, since each entry was reviewed for a second time.

In Phase V, we entered the data sheet entries into the Residential Spreadsheet (Table 1,) and the Commercial/Industrial Spreadsheet (Table 2). The third Spreadsheet Table summarizes Tables 1 and 2. The following Residential Spreadsheet columns contain input data: Polygon Descriptor Number, Census Tract, Census Block, Census Block Acres, Census Block Residential Units (Existing), Zoning Type, Residential Acres by Zone, and Allowable Density. See Section A-2, Development Standards, for an explanation of the Allowable Density calculation.

Explanations of the Residential Spreadsheet columns that are calculated follow:

- Percent of Total Residential is calculated for each type of zoning within a census block by dividing Residential Acres by Zone by the total residential acres.
- Average Density is a weighted average based on the acreage within each zone. This calculation is necessary for census blocks that contain two or more zones (multi-zone blocks). If there is only one type of zoning within the census block, then Average Density is the same as Allowable Density.
- Developed Residential Acres is calculated by dividing Census Block Residential Units (Existing) by the Average Density.
- Percent Vacant is calculated by dividing Vacant Residential Acres by Residential Acres by Zone.
- Vacant Residential Acres is calculated by subtracting Developed Residential Acres from Residential Acres by Zone.
- Potential Buildable Units is calculated by subtracting Census Block Residential Units from Maximum Allowed Units.
- Maximum Allowed Units is calculated by multiplying Residential Acres by Zone and Average Density.

The following Commercial/Industrial Spreadsheet columns contain input data: Polygon Descriptor Number, Census Tract, Census Block, Census Block Acres, Zoning Type, Commercial/Industrial Acres by Zone, Developed Commercial Acres, and Developed Industrial Acres.

Explanations of the Commercial/Industrial Spreadsheet columns that are calculated follow:

- Vacant Commercial Acres is calculated by subtracting Developed Commercial Acres from the Commercial/Industrial Acres by Zone.
- Leasable Commercial Square Feet is calculated by multiplying Vacant Commercial Acres by the Maximum Leasable square footage per acre. See Section A-2, Development Standards, for an explanation of the Maximum Leasable square footage per acre calculation.
- Vacant Industrial Acres is calculated by subtracting Developed Industrial Acres from the Total Commercial/Industrial Acres by Zone.

A-2 DEVELOPMENT STANDARDS

In accordance with the county zoning ordinance, this section provides *maximum allowable density per acre factors* for residential zones and *maximum leasable square feet per acre factors* for commercial zones. These factors are used in the Spreadsheet Tables to calculate the development estimates.

A-2.1 Residential Zoning Designations

Six residential zoning designations were identified in the county zoning ordinance. For each designation, we provide the *maximum allowable residential density* (expressed in units per acre). In calculating densities for zones with a minimum lot size of less than one acre, we use a *net acre* (34,848 square feet). A net acre is calculated by subtracting 20 percent from a gross acre (43,560 square feet) to account for streets and right-of-ways.[1] To calculate densities for residential zones with minimum lot sizes of one acre or greater, we use the gross acre figure. This is based on the assumption that larger lots are often platted along existing roads and additional streets and/or access points will not be needed.

A summary of residential zones and their maximum allowable densities is presented in Table A-2-1. Following the table is a description of each zone density calculation.

Table A-2-1
Residential Zoning Designations

Residential Zoning Designation	Abbreviation	Maximum Allowable Residential Density (Units Per Acre)
Rural Residential 5	RR-5	0.2
Rural Residential 10	RR-10	0.1
Rural Community Residential 1	RCR-1	1.0
Rural Community Residential 2.5	RCR-2.5	0.4
Rural Community Residential 5	RCR-5	0.2
Rural Community Residential 10	RCR-10	0.1
Residential 1, 2, 3	R-1, R-2, R-3	1.0

Rural Residential 5 (RR-5), Rural Community Residential 5 (RCR-5)

The minimum lot size for these zones is 5.0 acres. To calculate the maximum residential density per acre, we divided 1.0 gross acre by the 5.0 acre minimum lot size. The resulting density is 0.2 units per acre.

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[1] Derived from Land Use in 33 Oregon Cities, Bureau of Municipal Research and Service, University of Oregon, 1961.

Rural Residential 10 (RR-10), Rural Community Residential 10 (RCR-10)

The minimum lot size for these zones is 10.0 acres. To calculate the residential density per acre, we divided 1.0 gross acre by the 10.0 acre minimum lot size. The resulting density is 0.1 units per acre.

Rural Community Residential 1 (RCR-1), Residential (R-1, R-2, R-3)

The minimum lot size for these residential zones is 1.0 acres. To calculate the residential density per acre, we divided 1.0 gross acre by the 1.0 acre minimum lot size. The resulting density is 1.0 units per acre.

Rural Community Residential 2.5 (RCR-2.5)

The minimum lot size for this zone is 2.5 acres. To calculate the maximum residential density per acre, we divided 1.0 gross acre by the 2.5 acre minimum lot size. The resulting density is 0.2 units per acre.

A-2.2 Commercial Zoning Designations

Four commercial zoning designations were identified in the county zoning ordinance. We calculated the *maximum leasable commercial area* (expressed in square feet per gross acre) for each designation. A summary of findings is presented in Table A-2-2, followed by an explanation of the analysis used to calculate leasable area in the zones

Table A-2-2
Commercial Zoning Designations

Commercial Zoning Designation	Abbreviation	Maximum Leasable Commercial Area (Square Feet Per Acre)
Rural Commercial	RC	22,182
Rural Resort Commercial	RRC	43,560
Light Commercial	C-1	24,472
Heavy Commercial	C-2	24,472

The zoning ordinance provides unique criteria for each commercial zoning designation Therefore, the methodology for determining the maximum leasable commercial area per acre for each zoning designation differs. For all commercial zones on county lands, the net usable area figure we base calculations on is a gross acre (43,560 square feet) From this figure, allowances for setbacks, yards, and parking are subtracted to obtain the maximum leasable commercial area. If setbacks and yards are not required, a parking requirement allowance is generally the only figure subtracted from the net usable area figure. In cases where the zoning ordinance does not specify

parking requirements, a parking requirement allowance cannot be calculated and the maximum leasable commercial area may be overstated.

In cases where setbacks and yards are required, minimum lot dimensions must be determined in order to calculate how much area will be subtracted from the net usable area figure. If a minimum lot size is not specified in the zoning ordinance, the default minimum lot size that calculations are based on is one acre. If minimum lot dimensions are not provided in the zoning ordinance, the lot is assumed to be square and the lot dimensions are derived by taking the square root of the minimum lot size. Front and rear setbacks are subtracted from the minimum lot depth measurement to obtain the buildable lot depth. Side setbacks are subtracted from the minimum lot width measurement to obtain the buildable lot width. After subtracting setbacks, lot width is multiplied by lot depth to obtain the buildable (usable) area per lot. This figure multiplied by the number of lots per acre provides the net usable area per acre.

The parking requirement allowance is determined by averaging the parking requirements for permitted uses, as specified in the zoning ordinance. These are provided in terms of one space per "X" square feet of gross floor area (gfa). In calculating parking allowances, we use a standard allowance of parking lot space (parking, turning space, ingress, and egress) of 325 square feet per space.[2] The parking requirement average is divided into the standard allowance of parking lot space, which provides the parking ratio. The parking ratio plus one (1) is divided into the net usable area figure, providing leasable square feet per acre.

If the zoning ordinance provides a maximum lot coverage percent figure, the calculated leasable square feet figure (net usable area minus setbacks and parking allowance) must be less than or equal to the provided percentage.

Tables A-2-3, A-2-4, and A-2-5 display the data used to determine the maximum leasable commercial area per acre for the commercial zoning designation.

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2. Derived from Site Planning, Kevin Lynch and Gary Hack, 1985, page 461. This book suggests a range of 250-400 square feet per car be used. We selected the midpoint in this range.

Table A-2-3
Rural Commercial (RC)

Criteria	Formula	Result
Minimum Lot Size (sq. ft.)	None specified (default = 43,560 sq. ft., a gross acre)	n/a
Maximum Lots Per Acre	43,560 *(one acre)* ÷ 43,560 *(min. lot size)*	1 lot per acre
Setbacks & Yards (Linear Feet)	all sides = 5	n/a
Maximum Lot Coverage	None specified	n/a
Minimum Lot Dimensions (Linear Feet)	None specified *[sq. root of 43,560 = 208.7 (lot dimensions)]* (default width & depth = square root of minimum lot size)	n/a
Parking Requirement Average	[Retail (200) + Service/Repair (600) + Bulky Retail (600) + Banks/Office (600) + Medical/Dental (300) + Eating/Drinking (200)] ÷ 6	417 sq. ft. gfa
Parking Ratio	325 *(one space fixed)* ÷ 417 *(parking requirement)*	0.78
Net Usable Area Per Acre	208.7 *(lot dimension)* - 10 *(setbacks)* = 198.7 *(buildable lot dimension)*; 198.7 *(depth)* * 198.7 *(width)* = 39,484 *(buildable land per lot)*; 39,484 * 1 *(lots per acre)*	39,484 sq. ft.
Leasable Sq. Ft. Per Acre	39,484 *(net usable area)* ÷ 1.78 *(parking ratio + 1)*	22,182 sq. ft.

Table A-2-4
Rural Resort Commercial (RRC)

Criteria	Formula	Result
Minimum Lot Size (sq. ft.)	None specified (default = 43,560 sq. ft., a gross acre)	n/a
Maximum Lots Per Acre	43,560 *(one acre)* ÷ 43,560 *(min. lot size)*	1 lot per acre
Setbacks & Yards (Linear Feet)	None specified	n/a
Maximum Lot Coverage	None specified	n/a
Minimum Lot Dimensions (Linear Feet)	None specified (default width & depth = square root of minimum lot size)	n/a
Parking Requirement Average	None specified	n/a
Parking Ratio	325 *(one space fixed)* ÷ 0 *(parking requirement)*	0
Net Usable Area Per Acre	43,560 *(min. lot size)* - 0 *(setbacks)* = 43,560 sq ft *(buildable area per lot)*; 43,560 * 1 *(lots per acre)*	43,560 sq. ft
Leasable Sq. Ft. Per Acre	43,560 *(net usable area)* ÷ 1.00 *(parking ratio + 1)*	43,560 sq. ft

Table A-2-5
Light Commercial (C-1), Heavy Commercial (C-2)

Criteria	Formula	Result
Minimum Lot Size (sq. ft.)	None specified (default = 43,560 sq. ft., a gross acre)	n/a
Maximum Lots Per Acre	43,560 *(one acre)* ÷ 43,560 *(min. lot size)*	1 lot per acre
Setbacks & Yards (Linear Feet)	None specified	n/a
Maximum Lot Coverage	None specified	n/a
Minimum Lot Dimensions (Linear Feet)	None specified (default width & depth = square root of minimum lot size)	n/a
Parking Requirement Average	[Retail (200) + Service/Repair (600) + Bulky Retail (600) + Banks/Office (600) + Medical/Dental (300) + Eating/Drinking (200)] ÷ 6	417 sq. ft. gfa
Parking Ratio	325 *(one space fixed)* ÷ 417 *(parking requirement)*	0.78
Net Usable Area Per Acre	43,560 *(min. lot size)* − 0 *(setbacks)* = 43,560 sq. ft. *(buildable area per lot)*; 43,560 ÷ 1 *(lots per acre)*	43,560 sq. ft.
Leasable Sq. Ft. Per Acre	43,560 *(net usable area)* ÷ 1.78 *(parking ratio + 1)*	24,472 sq. ft

A-2.3 Industrial Zoning Designations

All industrial zones are referred to as "I" in the spreadsheet tables. Table A-2-6 shows the industrial zoning designations used in this analysis

Table A-2-6
Industrial Zoning Designations

Industrial Zoning Designation	Abbreviation
Rural Industrial	RI
Industrial	I
Marine Activity	MA

APPENDIX B
SPREADSHEET TABLES

We present the data from the county analysis in three spreadsheet tables. Tables 1 and 2 are organized by census tract and block in ascending order.

- **Table 1** provides residential development estimates.
- **Table 2** provides commercial and industrial development estimates.
- **Table 3** provides summary data totals for Tables 1 and 2.

Zoning Designations

The following zoning designations are found in Spreadsheet Tables 1 and 2:

R5	Rural Residential 5, Rural Community Residential 5
R10	Rural Residential 10, Rural Community Residential 10
R1	Rural Community Residential 1, Residential
R2.5	Rural Community Residential 2.5
RC	Rural Commercial
RRC	Rural Resort Commercial
C	Light Commercial, Heavy Commercial
I	Rural Industrial, Industrial, Marine Activity

TA : RESIDENTIAL LAND (OUTSIDE URBAN AREAS)

Location Curry County

Polygon Descriptor Number	Census Tract	Census Block	Census Block Acres	Census Block Res. Units (Existing)	Zoning Type	Res Acres by Zone	Percent of Total Res.	Allowable Density (units/acre)	Average Density (units/acre)	Developed Res Acres	Percent Vacant	Vacant Res. Acres	Potential Buildable Units	Maximum Allowed Units
M1	9501	110	1,424.3	23	RCR5	75.1	85%	0.2	0.3	72.5	18%	15.5	5	28
M1	--	--	--	--	RCR1	12.9	15%	1.0	--	--	--	--	--	--
M1	9501	112	1,274.0	27	RCR1	52.4	57%	1.0	0.6	44.1	52%	48.0	29	56
M1	--	--	--	--	RCR10	39.7	43%	0.1	--	--	--	--	--	--
M1	9501	113	1.2	8	RCR10	1.2	100%	0.1	0.1	1.2	0%	0.0	0	8
M1	9501	156	9,588.0	13	RCR5	3.9	2%	0.2	0.1	127.8	43%	97.4	10	23
M2	--	--	--	--	RR10	221.3	98%	0.1	--	--	--	--	--	--
M1	9501	157	2.5	0	RCR10	2.5	100%	0.1	0.1	0.0	100%	2.5	0	0
M2	9501	166	348.7	17	RR10	149.0	100%	0.1	0.1	149.0	0%	0.0	0	17
M2	9501	167	76.8	2	RR10	76.8	100%	0.1	0.1	20.0	74%	56.8	6	8
M6	9501	179	47,249.2	36	RR10	5.3	20%	0.1	0.2	27.0	0%	0.0	0	36
R2	--	--	--	--	RR5	21.7	80%	0.2	--	--	--	--	--	--
M1	9501	196	2.0	2	RCR1	1.0	100%	1.0	1.0	1.0	0%	0.0	0	2
M1	9501	207	2,182.1	44	RCR5	84.9	59%	0.2	0.4	101.9	29%	42.6	18	62
M1	--	--	--	--	RCR1	25.6	18%	1.0	--	--	--	--	--	--
M1	--	--	--	--	RCR2.5	23.7	16%	0.4	--	--	--	--	--	--
M1	--	--	--	--	R1,2,3	10.3	7%	1.0	--	--	--	--	--	--
R1	9501	216	167.0	2	RR5	36.8	100%	0.2	0.2	10.0	73%	26.8	5	7
R1	9501	218	356.3	4	RR5	12.9	100%	0.2	0.2	12.9	0%	0.0	0	4
M1	9501	221	19.3	1	RCR5	9.5	100%	0.2	0.2	5.0	47%	4.5	1	2
M1	9501	222	7.4	4	R1,2,3	4.4	100%	1.0	1.0	4.0	9%	0.4	0	4
R1	9501	227	1,805.3	32	RR5	75.1	100%	0.2	0.2	75.1	0%	0.0	0	32
R1	9501	230	7.7	0	RR5	7.7	100%	0.2	0.2	0.0	100%	7.7	2	2
R1	9501	232	44.5	8	RR5	9.1	100%	0.2	0.2	9.1	0%	0.0	0	8
R1	9501	233	5.9	8	RR5	5.3	100%	0.2	0.2	5.3	0%	0.0	0	8
R1	9501	234	4.2	2	RR5	4.2	100%	0.2	0.2	4.2	0%	0.0	0	2
M4	9501	257	383.7	23	RR5	38.0	40%	0.2	0.2	94.4	0%	0.0	0	23
	--	--	--	--	RR5	14.5	15%	0.2	--	--	--	--	--	--
	--	--	--	--	RR10	41.9	44%	0.1	--	--	--	--	--	--
M1	9501	272	1.0	0	R1,2,3	1.0	100%	1.0	1.0	0.0	100%	1.0	1	1
M1	9501	273	1.5	0	R1,2,3	1.5	100%	1.0	1.0	0.0	100%	1.5	2	2
M5	9501	305	489.6	20	RR5	9.1	100%	0.2	0.2	9.1	0%	0.0	0	20
M5	9501	356	7.4	0	RR5	3.1	100%	0.2	0.2	0.0	100%	3.1	1	1
M5	9501	357	1.7	0	RR5	1.7	100%	0.2	0.2	0.0	100%	1.7	0	0
M6	9501	402	251.3	20	RR10	1.4	100%	0.1	0.1	1.4	0%	0.0	0	20
M5	9501	403	546.3	19	RR5	24.0	30%	0.2	0.1	80.4	0%	0.0	0	19
M6	9501	405	4.7	0	RR5	8.7	100%	0.2	0.2	0.0	100%	8.7	2	2
M6	9501	415B	1,615.5	28	RR5	54.3	91%	0.2	0.2	59.6	0%	0.0	0	28
M6	--	--	--	--	RR10	5.3	9%	0.1	--	--	--	--	--	--
M6	9501	419	4,612.1	19	RR10	88.8	69%	0.1	0.1	129.4	0%	0.0	0	19
R2	--	--	--	--	RR5	40.6	31%	0.2	--	--	--	--	--	--
M6	9501	420	178.4	31	RR10	10.5	100%	0.1	0.1	10.5	0%	0.0	0	31
M6	9501	421	1.0	0	RR10	1.0	100%	0.1	0.1	0.0	100%	1.0	0	0
M6	9501	422	65.2	0	RR10	42.3	100%	0.1	0.1	0.0	100%	42.3	4	4
R2	9501	423	106.7	3	RR5	1.9	100%	0.2	0.2	1.9	0%	0.0	0	3
R2	9501	424	10.6	1	RR5	2.1	100%	0.2	0.2	2.1	0%	0.0	0	1
R2	9501	425	20.0	0	RR5	20.0	100%	0.2	0.2	0.0	100%	20.0	4	4
R2	9501	426	3.0	0	RR5	3.0	100%	0.2	0.2	0.0	100%	3.0	1	1
R2	9501	427	24.2	6	RR5	5.0	100%	0.2	0.2	5.0	0%	0.0	0	6
R2	9501	428	21.5	6	RR5	2.2	100%	0.2	0.2	2.2	0%	0.0	0	6
R3	9501	432	2,494.2	3	RR10	1.3	100%	0.1	0.1	1.3	0%	0.0	0	3
R3	9501	434	114.9	4	RR10	31.8	100%	0.1	0.1	31.8	0%	0.0	0	4
R3	9501	439	72.9	1	RR10	12.2	100%	0.1	0.1	10.0	18%	2.2	0	1
M7	9501	548	10,940.1	27	RCR10	104.7	59%	0.1	0.1	176.2	0%	0.0	0	27
M7	--	--	--	--	RR5	71.5	41%	0.2	--	--	--	--	--	--
M7	9501	550	141.8	13	RCR5	17.5	72%	0.2	0.2	24.3	0%	0.0	0	13
M7	--	--	--	--	RR5	6.8	28%	0.2	--	--	--	--	--	--
M7	9501	581	19,458.9	27	RCR5	0.8	100%	0.2	0.2	0.8	0%	0.0	0	27
M7	9501	583	33,278.9	7	RCR5	35.3	83%	0.2	0.2	38.2	10%	4.1	1	8
M7	--	--	--	--	RCR10	7.0	17%	0.1	--	--	--	--	--	--
M7	9501	593	129.5	7	RCR5	4.9	67%	0.2	0.2	7.3	0%	0.0	0	7
--	--	--	--	--	RR5	2.4	33%	0.2	--	--	--	--	--	--
	9502	124	706.2	4	RR10	12.5	100%	0.1	0.1	12.5	0%	0.0	0	4
8	9502	128	122.1	4	RR10	27.9	100%	0.1	0.1	27.9	0%	0.0	0	4
9	9502	141	79.1	2	RR10	7.9	100%	0.1	0.1	7.9	0%	0.0	0	2
M8	9502	143	418.6	8	RR10	53.5	88%	0.1	0.2	38.5	37%	22.3	5	13

TAB. E: RESIDENTIAL LAND (OUTSIDE URBAN AREAS)

Location: Curry County

Polygon Descriptor Number	Census Tract	Census Block	Census Block Acres	Census Block Res Units (Existing)	Zoning Type	Res Acres by Zone	Percent of Total Res.	Allowable Density (units/acre)	Average Density (units/acre)	Developed Res Acres	Percent Vacant	Vacant Res Acres	Potential Buildable Units	Maximum Allowed Units
M8	--	--	--	--	RCR1	7.3	12%	1.0	--	--	--	--	--	--
M8	9502	217	132.2	8	RCR2.5	17.0	56%	0.4	0.6	14.3	52%	15.8	9	17
M8	--	--	--	--	RCR1	9.7	32%	1.0	--	--	--	--	--	--
M8	--	--	--	--	RCR10	3.4	11%	0.1	--	--	--	--	--	--
M8	9502	219	4.9	0	RCR10	4.9	100%	0.1	0.1	0.0	100%	4.9	0	0
M8	9502	220	1,418.1	22	RCR10	55.8	28%	0.1	0.5	42.1	79%	160.8	84	106
M8	--	--	--	--	RCR1	70.4	35%	1.0	--	--	--	--	--	--
M8	--	--	--	--	RCR2.5	74.0	36%	0.4	--	--	--	--	--	--
R6	--	--	--	--	RR5	2.6	1%	0.2	--	--	--	--	--	--
R6	9502	223	1,798.9	8	RR5	1.9	100%	0.2	0.2	1.9	0%	0.0	0	8
R6	9502	231	46.5	1	RR5	0.9	100%	0.2	0.2	0.9	0%	0.0	0	1
R6	9502	233	8.2	0	RR5	8.2	100%	0.2	0.2	0.0	100%	8.2	2	2
R6	9502	234	2.0	1	RR5	5.4	100%	0.2	0.2	5.0	7%	0.4	0	1
R6	9502	235	2.0	0	RR5	2.0	100%	0.2	0.2	0.0	100%	2.0	0	0
R6	9502	237	156.7	6	RR5	19.2	100%	0.2	0.2	19.2	0%	0.0	0	6
M8	9502	239	2.5	0	RCR1	1.3	50%	1.0	0.6	0.0	100%	2.5	1	1
M8	--	--	--	--	RCR10	1.3	50%	0.1	--	--	--	--	--	--
M8	9502	240	1.5	0	RCR1	1.5	100%	1.0	1.0	0.0	100%	1.5	2	2
M10 M11	9502	301	7,174.3	92	RR5	98.6	100%	0.2	0.2	98.6	0%	0.0	0	92
R7	9502	306	3,112.5	69	RR5	112.6	26%	0.2	0.3	274.1	36%	152.9	38	107
M8	--	--	--	--	RCR2.5	49.2	12%	0.4	--	--	--	--	--	--
M8 M9	--	--	--	--	RCR5	54.6	13%	0.2	--	--	--	--	--	--
M8	--	--	--	--	RCR10	179.7	42%	0.1	--	--	--	--	--	--
M8 M9	--	--	--	--	RCR1	31.0	9%	1.0	--	--	--	--	--	--
M8	9502	307	1.7	0	RCR5	1.7	100%	0.2	0.2	0.0	100%	1.7	0	0
R7	9502	308	1.7	0	RR5	1.7	100%	0.2	0.2	0.0	100%	1.7	0	0
[illegible]	9502	310	78.1	10	RCR2.5	15.8	48%	0.4	0.2	32.8	0%	0.0	0	10
	--	--	--	--	RCR10	17.0	52%	0.1	--	--	--	--	--	--
M8	9502	312	72.6	21	RCR1	26.7	85%	1.0	0.9	23.9	24%	7.5	7	28
M8	--	--	--	--	RCR5	4.7	15%	0.2	--	--	--	--	--	--
M8	9502	313	1.2	0	RCR5	1.2	100%	0.2	0.2	0.0	100%	1.2	0	0
M9	9502	314	145.5	21	RCR2.5	15.0	79%	0.4	0.5	19.1	0%	0.0	0	21
M9	--	--	--	--	RCR1	4.1	21%	1.0	--	--	--	--	--	--
M9	9502	317	5.2	2	RCR2.5	1.3	100%	0.4	0.4	1.3	0%	0.0	0	2
M9	9502	318	3.7	1	RCR2.5	1.1	100%	0.4	0.4	1.1	0%	0.0	0	1
M9	9502	320	17.0	8	RCR2.5	6.0	48%	0.4	0.7	11.3	9%	1.1	1	9
M9	--	--	--	--	RCR1	6.4	52%	1.0	--	--	--	--	--	--
M9	9502	321	9.9	13	RCR1	7.1	100%	1.0	1.0	7.1	0%	0.0	0	13
M9	9502	322	4.2	3	RCR1	4.2	100%	1.0	1.0	3.0	29%	1.2	1	4
M9	9502	323	28.4	19	RCR1	28.4	100%	1.0	1.0	19.0	33%	9.4	6	28
M9	9502	324	1.0	2	RCR1	1.0	100%	1.0	1.0	1.0	0%	0.0	0	2
M9	9502	325	84.3	41	RCR1	25.9	49%	1.0	0.7	53.0	0%	0.0	0	41
M9	--	--	--	--	RCR2.5	27.1	51%	0.4	--	--	--	--	--	--
M9	9502	326	1.2	3	RCR1	1.2	100%	1.0	1.0	1.2	0%	0.0	0	3
M9	9502	327	687.9	3	RCR1	25.6	13%	1.0	0.3	9.8	95%	183.7	56	59
M9	--	--	--	--	RR5	167.9	87%	0.2	--	--	--	--	--	--
M9	9502	331	2.0	8	RCR1	2.0	100%	1.0	1.0	2.0	0%	0.0	0	8
M10	9502	333	2,265.9	1	RR5	24.6	100%	0.2	0.2	5.0	80%	19.6	4	5
M10	9502	337	1,443.6	67	RR5	147.2	100%	0.2	0.2	147.2	0%	0.0	0	67
M10	9502	338	1.5	0	RR5	1.5	100%	0.2	0.2	0.0	100%	1.5	0	0
M10	9502	345	4.9	0	RR5	2.8	100%	0.2	0.2	0.0	100%	2.8	1	1
M10	9502	347	405.0	59	RR5	23.7	100%	0.2	0.2	23.7	0%	0.0	0	59
M10	9502	348	1.2	0	RR5	1.2	100%	0.2	0.2	0.0	100%	1.2	0	0
M11	9502	349	156.4	70	RR5	40.1	100%	0.2	0.2	40.1	0%	0.0	0	70
M11	9502	350	2.2	0	RR5	2.2	100%	0.2	0.2	0.0	100%	2.2	0	0
M11	9502	351	225.4	6	RR5	4.9	100%	0.2	0.2	4.9	0%	0.0	0	6
M11 M10	9502	354	343.5	26	RR5	57.3	100%	0.2	0.2	57.3	0%	0.0	0	26
M9	9502	367	116.1	5	RR5	12.9	100%	0.2	0.2	12.9	0%	0.0	0	5
R7	9502	389	4.4	0	RR5	1.0	100%	0.2	0.2	0.0	100%	1.0	0	0
R7	9502	390	2.5	0	RR5	2.5	100%	0.2	0.2	0.0	100%	2.5	1	1
R7	9502	391	3.0	0	RR5	3.0	100%	0.2	0.2	0.0	100%	3.0	1	1
R7	9502	392	2.5	0	RR5	2.5	100%	0.2	0.2	0.0	100%	2.5	1	1
R7	9502	393	31.1	5	RR5	31.1	100%	0.2	0.2	25.0	20%	6.1	1	6
	9502	394	19.8	2	RR5	2.5	100%	0.2	0.2	2.5	0%	0.0	0	2
M11	9502	501	150.0	1	RR5	2.9	100%	0.2	0.2	2.9	0%	0.0	0	1
M11	9502	506	292.1	4	RR5	11.4	100%	0.2	0.2	11.4	0%	0.0	0	4

TA : RESIDENTIAL LAND (OUTSIDE URBAN AREAS)

Location: Curry County

Polygon Descriptor Number	Census Tract	Census Block	Census Block Acres	Census Block Res. Units (Existing)	Zoning Type	Res Acres by Zone	Percent of Total Res.	Allowable Density (units/acre)	Average Density (units/acre)	Developed Res Acres	Percent Vacant	Vacant Res Acres	Potential Buildable Units	Maximum Allowed Units
M11	9502	507	796.4	2	RR5	38.3	100%	0.2	0.2	10.0	74%	28.3	6	8
M11	9502	510B	293.3	76	RR5	1.2	100%	0.2	0.2	1.2	0%	0.0	0	76
R9	9502	604	4,395.4	80	RR10	53.9	54%	0.1	0.1	98.9	0%	0.0	0	80
R10	–	–	--	–	RR5	45.0	46%	0.2	--	–	--	--	--	--
R10	9502	609B	4.9	2	RR5	2.1	100%	0.2	0.2	2.1	0%	0.0	0	2
R8	9502	610D	1,682.5	31	RR5	34.8	100%	0.2	0.2	34.8	0%	0.0	0	31
R11	9502	713	1,365.2	11	RR10	35.9	100%	0.1	0.1	35.9	0%	0.0	0	11
R11	9502	712	410.2	39	RR10	97.5	90%	0.1	0.1	108.9	0%	0.0	0	39
R11	9502	712	410.2	39	RR5	11.4	10%	0.2	--	--	--	–	--	--
R11	9502	717	3.5	2	RR10	3.5	100%	0.1	0.1	3.5	0%	0.0	0	2
R11 R10	9502	718	2,070.9	18	RR5	60.3	81%	0.2	0.2	74.0	0%	0.0	0	18
R11	--	–	--	--	RR10	13.7	19%	0.1	--	--	--	--	--	--
R10	9502	720	422.5	18	RR5	91.9	100%	0.2	0.2	90.0	2%	1.9	0	18
R10	9502	721	5.4	3	RR5	2.7	100%	0.2	0.2	2.7	0%	0.0	0	3
R11	9502	725	87.5	8	RR5	52.6	100%	0.2	0.2	40.0	24%	12.6	3	11
R12	9502	747	626.9	18	RR5	66.3	100%	0.2	0.2	66.3	0%	0.0	0	18
M12	9502	761	711.6	15	RR10	32.9	100%	0.1	0.1	32.9	0%	0.0	0	15
R13	9502	763	46.2	0	RR10	16.2	100%	0.1	0.1	0.0	100%	16.2	2	2
M12	9502	765	168.3	22	RR10	74.1	100%	0.1	0.1	74.1	0%	0.0	0	22
M12	9502	768	596.3	6	RR10	7.6	100%	0.1	0.1	7.6	0%	0.0	0	6
M12	9502	770	1.5	0	RR10	1.5	100%	0.1	0.1	0.0	100%	1.5	0	0
M12	9502	775	1,342.7	8	RR10	25.3	100%	0.1	0.1	25.3	0%	0.0	0	8
R11	9502	794	51.6	0	RR10	17.0	100%	0.1	0.1	0.0	100%	17.0	2	2
M7	9503	101	135,890.4	4	RCR10	53.2	100%	0.1	0.1	40.0	25%	13.2	1	5
M7	9503	117	19,194.5	11	RCR10	12.9	100%	0.1	0.1	12.9	0%	0.0	0	11
R15	9503	133	53,500.9	9	RR10	16.8	100%	0.1	0.1	16.8	0%	0.0	0	9
M12	9503	174	4,348.7	18	RR10	31.5	47%	0.1	0.2	67.3	0%	0.0	0	18
'	--	--	--	--	RR5	35.8	53%	0.2	--	--	--	--	--	--
.	9503	180	162.6	8	RR10	34.2	100%	0.1	0.1	34.2	0%	0.0	0	8
M13	9503	202	297.3	0	RR5	0.5	100%	0.2	0.2	0.0	100%	0.5	0	0
M13 R16	9503	203	2,383.3	53	RR5	195.4	100%	0.2	0.2	195.4	0%	0.0	0	53
R16	9503	205	47.2	2	RR5	51.1	100%	0.2	0.2	10.0	80%	41.1	8	10
M13	9503	206B	900.2	52	RR10	17.7	100%	0.1	0.1	17.7	0%	0.0	0	52
M13	9503	210	764.0	61	RR5	313.5	100%	0.2	0.2	305.0	3%	8.5	2	63
M13	9503	211	4.4	0	RR5	4.4	100%	0.2	0.2	0.0	100%	4.4	1	1
M13	9503	212	63.0	11	RR5	4.8	100%	0.2	0.2	4.8	0%	0.0	0	11
M13	9503	213	200.9	0	RR5	44.0	100%	0.2	0.2	0.0	100%	44.0	9	9
M13	9503	214	117.6	0	RR5	1.8	100%	0.2	0.2	0.0	100%	1.8	0	0
M13	9503	216	681.7	12	RR5	28.5	100%	0.2	0.2	28.5	0%	0.0	0	12
M13	9503	217	0.7	0	RR5	0.7	100%	0.2	0.2	0.0	100%	0.7	0	0
M13	9503	218	651.1	60	RR5	324.1	100%	0.2	0.2	300.0	7%	24.1	5	65
M13	9503	219	18.0	5	RR5	15.4	100%	0.2	0.2	15.4	0%	0.0	0	5
M13	9503	220	1.2	1	RR5	1.2	100%	0.2	0.2	1.2	0%	0.0	0	1
M13	9503	221	3.7	4	RR5	3.7	100%	0.2	0.2	3.7	0%	0.0	0	4
M13	9503	222	218.9	34	RR5	215.9	100%	0.2	0.2	170.0	21%	45.9	9	43
M13	9503	223	33.9	10	RR5	33.9	100%	0.2	0.2	33.9	0%	0.0	0	10
M13	9503	224	117.1	17	RR5	102.4	100%	0.2	0.2	85.0	17%	17.4	3	20
M13	9503	225	3.0	0	RR5	3.0	100%	0.2	0.2	0.0	100%	3.0	1	1
M13	9503	226	23.2	6	RR5	23.9	100%	0.2	0.2	23.9	0%	0.0	0	6
M13	9503	227	4.9	0	RR5	4.9	100%	0.2	0.2	0.0	100%	4.9	1	1
M13	9503	228	8.2	5	RR5	8.2	100%	0.2	0.2	8.2	0%	0.0	0	5
M13	9503	229	19.3	7	RR5	19.3	100%	0.2	0.2	19.3	0%	0.0	0	7
M13	9503	230	2.7	1	RR5	2.7	100%	0.2	0.2	2.7	0%	0.0	0	1
M13	9503	231	1.2	1	RR5	1.2	100%	0.2	0.2	1.2	0%	0.0	0	1
M13	9503	232	7.4	2	RR5	7.4	100%	0.2	0.2	7.4	0%	0.0	0	2
M13	9503	233	7.9	2	RR5	7.9	100%	0.2	0.2	7.9	0%	0.0	0	2
M13	9503	234	10.4	5	RR5	10.4	100%	0.2	0.2	10.4	0%	0.0	0	5
M13	9503	235	7.7	2	RR5	7.7	100%	0.2	0.2	7.7	0%	0.0	0	2
M13	9503	236	226.1	34	RR5	101.5	100%	0.2	0.2	101.5	0%	0.0	0	34
M13	9503	237	22.7	13	RR5	11.8	100%	0.2	0.2	11.8	0%	0.0	0	13
M13	9503	238	5.7	3	RR5	5.7	100%	0.2	0.2	5.7	0%	0.0	0	3
13	9503	239	21.3	6	RR5	17.8	100%	0.2	0.2	17.8	0%	0.0	0	6
3	9503	240	15.8	6	RR5	15.8	100%	0.2	0.2	15.8	0%	0.0	0	6
13	9503	241	430.4	16	RR5	106.9	100%	0.2	0.2	80.0	25%	26.9	5	21
.3	9503	242	362.7	10	RR5	49.6	100%	0.2	0.2	49.6	0%	0.0	0	10
M13	9503	243	45.5	2	RR5	12.4	100%	0.2	0.2	10.0	19%	2.4	0	2

B1 RESIDENTIAL LAND (OUTSIDE URBAN AREAS)

Location: Curry County

Polygon Descriptor Number	Census Tract	Census Block	Census Block Acres	Census Block Res Units (Existing)	Zoning Type	Res Acres by Zone	Percent of Total Res.	Allowable Density (units/acre)	Average Density (units/acre)	Developed Res Acres	Percent Vacant	Vacant Res Acres	Potential Buildable Units	Maximum Allowed Units
M13	9503	244	18.5	1	RR5	3.2	100%	0.2	0.2	3.2	0%	0.0	0	1
M13	9503	258	882.4	52	RR5	194.6	100%	0.2	0.2	194.6	0%	0.0	0	52
M13	9503	259	24.7	5	RR5	24.7	100%	0.2	0.2	24.7	0%	0.0	0	5
M13	9503	260	91.4	3	RR5	41.4	100%	0.2	0.2	15.0	64%	26.4	5	8
M13	9503	266	349.4	27	RR10	34.4	41%	0.1	0.2	82.9	0%	0.0	0	27
M13	--	--	--	--	RR5	48.5	59%	0.2	--	--	--	--	--	--
M13	9503	268	1.5	0	RR5	1.5	100%	0.2	0.2	0.0	100%	1.5	0	0
M13	9503	269	17.0	0	RR10	12.6	100%	0.1	0.1	0.0	100%	12.6	1	1
M13	9503	270	104.0	0	RR10	23.1	100%	0.1	0.1	0.0	100%	23.1	2	2
M13	9503	271	1.2	19	RR10	1.2	100%	0.1	0.1	1.2	0%	0.0	0	19
M13	9503	272	2.2	16	RR10	2.2	100%	0.1	0.1	2.2	0%	0.0	0	16
M13	9503	273	2.0	15	RR10	2.0	100%	0.1	0.1	2.0	0%	0.0	0	15
M13	9503	274	66.2	22	RR10	25.3	100%	0.1	0.1	25.3	0%	0.0	0	22
M13	9503	275	14.3	1	RR10	10.2	100%	0.1	0.1	10.0	2%	0.2	0	1
M13	9503	277	101.3	16	RR10	17.1	100%	0.1	0.1	17.1	0%	0.0	0	16
M13	9503	278	152.5	6	RR10	21.9	100%	0.1	0.1	21.9	0%	0.0	0	6
R17	9503	280	145.3	11	RR5	25.8	100%	0.2	0.2	25.8	0%	0.0	0	11
R17	9503	284	1.7	0	RR5	1.5	100%	0.2	0.2	0.0	100%	1.5	0	0
R19	9503	327	1,268.4	8	RR5	2.4	100%	0.2	0.2	2.4	0%	0.0	0	8
M14	9503	337	3,137.2	132	RR5	250.4	100%	0.2	0.2	250.4	0%	0.0	0	132
M14	9503	338	5.7	0	RR5	5.7	100%	0.2	0.2	0.0	100%	5.7	1	1
M14	9503	346	255.5	2	RR5	16.1	100%	0.2	0.2	10.0	38%	6.1	1	3
R19	9503	347	207.3	15	RR10	42.8	100%	0.1	0.1	42.8	0%	0.0	0	15
R19	9503	348	635.5	13	RR5	44.5	100%	0.2	0.2	44.5	0%	0.0	0	13
R18	9503	351	67.5	2	RR5	42.6	100%	0.2	0.2	10.0	77%	32.6	7	9
R18	9503	352	24.0	3	RR5	14.7	100%	0.2	0.2	14.7	0%	0.0	0	3
R19	9503	355	353.8	28	RR5	51.2	100%	0.2	0.2	51.2	0%	0.0	0	28
	9503	357	368.2	10	RR5	2.6	6%	0.2	0.1	45.6	0%	0.0	0	10
	--	--	--	--	RR10	43.0	94%	0.1	--	--	--	--	--	--
R19	9503	358	3.7	0	RR5	0.7	100%	0.2	0.2	0.0	100%	0.7	0	0
R19	9503	360	193.2	22	RR10	89.0	94%	0.1	0.1	94.9	0%	0.0	0	22
R19	--	--	--	--	RR5	5.9	6%	0.2	--	--	--	--	--	--
R19	9503	361	7.9	2	RR5	7.9	100%	0.2	0.2	7.9	0%	0.0	0	2
R19	9503	362	16.3	3	RR5	7.8	60%	0.2	0.2	12.9	0%	0.0	0	3
R19	--	--	--	--	RR10	5.1	40%	0.1	--	--	--	--	--	--
M14	9503	363	129.7	42	RR5	19.6	50%	0.2	0.2	39.4	0%	0.0	0	42
M14	--	--	--	--	RR5	19.8	50%	0.2	--	--	--	--	--	--
M14	9503	365	6.7	0	RR5	6.7	100%	0.2	0.2	0.0	100%	6.7	1	1
M14	9503	366	17.5	2	RR5	0.7	100%	0.2	0.2	0.7	0%	0.0	0	2
M14	9503	369	3.7	2	RR5	0.3	100%	0.2	0.2	0.3	0%	0.0	0	2
M14	9503	370	3.0	4	RR5	0.6	100%	0.2	0.2	0.6	0%	0.0	0	4
M14	9503	373	5.2	0	RR5	0.7	100%	0.2	0.2	0.0	100%	0.7	0	0
M14	9503	375	1.7	0	RR5	1.7	100%	0.2	0.2	0.0	100%	1.7	0	0
M14	9503	376	8.9	0	RR5	8.9	100%	0.2	0.2	0.0	100%	8.9	2	2
M14	9503	377	2.5	0	RR5	2.5	100%	0.2	0.2	0.0	100%	2.5	1	1
M14	9503	378	16.3	18	RR5	13.8	100%	0.2	0.2	13.8	0%	0.0	0	18
R17	9503	401	180.9	9	RR5	16.1	100%	0.2	0.2	16.1	0%	0.0	0	9
R17	9503	403	12.4	1	RR5	10.3	100%	0.2	0.2	5.0	51%	5.3	1	2
R17	9503	404B	237.2	22	RR5	15.7	100%	0.2	0.2	15.7	0%	0.0	0	22
R17	9503	407B	192.7	0	RR5	2.2	100%	0.2	0.2	0.0	100%	2.2	0	0
R17	9503	502	26.9	2	RR5	1.2	100%	0.2	0.2	1.2	0%	0.0	0	2
R17	9503	504	20.0	2	RR5	4.0	100%	0.2	0.2	4.0	0%	0.0	0	2
R17	9503	505B	67.5	2	RR5	9.4	100%	0.2	0.2	9.4	0%	0.0	0	2
R17	9503	515B	26.2	3	RR5	15.3	100%	0.2	0.2	15.0	2%	0.3	0	3
R17	9503	516	15.3	10	RR5	6.7	100%	0.2	0.2	6.7	0%	0.0	0	10
R17	9503	517	11.6	2	RR5	11.6	100%	0.2	0.2	10.0	14%	1.6	0	2
R17	9503	518B	3.7	1	RR5	1.6	100%	0.2	0.2	1.6	0%	0.0	0	1
M14	9504	101	49.4	29	RR5	7.4	100%	0.2	0.2	7.4	0%	0.0	0	29
M14	9504	103	1,587.1	519	RR5	111.1	89%	0.2	0.2	124.5	0%	0.0	0	519
M15	--	--	--	--	RR10	13.8	11%	0.1	--	--	--	--	--	--
M15	9504	115	88.5	2	RR10	14.3	100%	0.1	0.1	14.3	0%	0.0	0	2
M15	9504	116	10.4	1	RR10	10.4	100%	0.1	0.1	10.4	0%	0.0	0	1
M15	9504	117	3.0	0	RR10	3.0	100%	0.1	0.1	0.0	100%	3.0	0	0
M15	9504	118	4.7	2	RR10	4.7	100%	0.1	0.1	4.7	0%	0.0	0	2
M15	9504	119	36.1	21	RR10	23.5	100%	0.1	0.1	23.5	0%	0.0	0	21
M15	9504	120	0.7	6	RR10	0.7	100%	0.1	0.1	0.7	0%	0.0	0	6
M15	9504	121	10.1	37	RR10	3.7	100%	0.1	0.1	3.7	0%	0.0	0	37

TA C: RESIDENTIAL LAND (OUTSIDE URBAN AREAS)

Location: Curry County

Polygon Descriptor Number	Census Tract	Census Block	Census Block Acres	Census Block Res. Units (Existing)	Zoning Type	Res Acres by Zone	Percent of Total Res.	Allowable Density (units/acre)	Average Density (units/acre)	Developed Res. Acres	Percent Vacant	Vacant Res Acres	Potential Buildable Units	Maximum Allowed Units
M15	9504	122	26.9	5	RR10	28.1	100%	0.1	0.1	28.1	0%	0.0	0	5
M15	9504	123	13.3	20	RR10	3.7	100%	0.1	0.1	3.7	0%	0.0	0	20
M15	9504	310	166.1	56	RR10	12.2	100%	0.1	0.1	12.2	0%	0.0	0	56
M15	9504	311	25.2	27	RR10	11.5	100%	0.1	0.1	11.5	0%	0.0	0	27
M15	9504	312	124.0	43	RR10	10.1	100%	0.1	0.1	10.1	0%	0.0	0	43
M15	9504	313	3.7	0	RR10	1.6	100%	0.1	0.1	0.0	100%	1.6	0	0
M15	9504	314	21.5	16	RR10	11.3	100%	0.1	0.1	11.3	0%	0.0	0	16
M15	9504	315	7.9	51	RR10	8.3	100%	0.1	0.1	8.3	0%	0.0	0	51
M15	9504	316	17.0	12	RR10	17.0	100%	0.1	0.1	17.0	0%	0.0	0	12
M15	9504	317	5.9	11	RR10	5.9	100%	0.1	0.1	5.9	0%	0.0	0	11
M15	9504	318	23.7	18	RR10	23.7	100%	0.1	0.1	23.7	0%	0.0	0	18
M15	9504	319	14.6	19	RR10	14.6	100%	0.1	0.1	14.6	0%	0.0	0	19
M15	9504	320	17.0	13	RR10	21.1	100%	0.1	0.1	21.1	0%	0.0	0	13
M15	9504	321	2.2	7	RR10	2.2	100%	0.1	0.1	2.2	0%	0.0	0	7
M15	9504	322	4.0	0	RR10	4.0	100%	0.1	0.1	0.0	100%	4.0	0	0
M15	9504	323	6.7	6	RR10	6.7	100%	0.1	0.1	6.7	0%	0.0	0	6
M15	9504	325	2.7	0	RR10	2.7	100%	0.1	0.1	0.0	100%	2.7	0	0
M15	9504	326	1.5	0	RR10	1.5	100%	0.1	0.1	0.0	100%	1.5	0	0
R21	9504	401	92,337.8	31	RR5	102.6	100%	0.2	0.2	102.6	0%	0.0	0	31
R20	9504	413	217.7	4	RR5	43.2	100%	0.2	0.2	20.0	54%	23.2	5	9
R20	9504	414	100.3	6	RR5	69.0	100%	0.2	0.2	30.0	57%	39.0	8	14
R20	9504	415	8.2	0	RR5	8.2	100%	0.2	0.2	0.0	100%	8.2	2	2
R20	9504	416	19.8	0	RR5	13.8	100%	0.2	0.2	0.0	100%	13.8	3	3
R20	9504	417	1,268.9	0	RR5	26.5	100%	0.2	0.2	0.0	100%	26.5	5	5
R19	9504	429	146.0	10	RR5	17.0	100%	0.2	0.2	17.0	0%	0.0	0	10
R19	9504	433	1,549.1	4	RR5	2.5	100%	0.2	0.2	2.5	0%	0.0	0	4
R19	9504	434	2.2	0	RR5	0.7	100%	0.2	0.2	0.0	100%	0.7	0	0
R19	9504	445	308.6	0	RR5	13.1	100%	0.2	0.2	0.0	100%	13.1	3	3
I	9504	446	5,178.7	36	RR5	216.4	100%	0.2	0.2	180.0	17%	36.4	7	43
.9	9504	447	200.6	0	RR5	12.9	100%	0.2	0.2	0.0	100%	12.9	3	3
M14	9504	449	243.4	23	RR10	22.8	47%	0.1	0.2	49.0	0%	0.0	0	23
R19	--	--	--	--	RR5	26.2	53%	0.2	--	--	--	--	--	--
R19	9504	450	507.3	13	RR5	26.9	55%	0.2	0.2	49.1	0%	0.0	0	13
M14	--	--	--	--	RR10	22.2	45%	0.1	--	--	--	--	--	--
M14	9504	452	22.0	0	RR10	22.0	100%	0.1	0.1	0.0	100%	22.0	2	2
M14	9504	453	3.0	0	RR10	3.0	100%	0.1	0.1	0.0	100%	3.0	0	0
M14	9504	454	1.2	0	RR10	1.2	100%	0.1	0.1	0.0	100%	1.2	0	0
M15	9504	463	532.0	8	RR5	30.1	60%	0.2	0.2	50.0	0%	0.3	0	8
M15	--	--	--	--	RR10	20.2	40%	0.1	--	--	--	--	--	--
M15	9504	464	8.2	0	RR5	4.8	70%	0.2	0.2	0.0	100%	6.9	1	1
M15	--	--	--	--	RR10	2.1	30%	0.1	--	--	--	--	--	--
M15	9504	465	13.6	2	RR10	15.4	100%	0.1	0.1	15.4	0%	0.0	0	2
M15	9504	466	32.1	10	RR10	33.8	100%	0.1	0.1	33.8	0%	0.0	0	10
M15	9504	467	21.0	23	RR10	10.8	100%	0.1	0.1	10.8	0%	0.0	0	23
M15	9504	468	40.5	7	RR10	6.8	100%	0.1	0.1	6.8	0%	0.0	0	7
M15	9504	469	1,307.7	41	RR10	89.1	100%	0.1	0.1	89.1	0%	0.0	0	41
M15	9504	470	2.7	0	RR10	1.1	100%	0.1	0.1	0.0	100%	1.1	0	0
R21	9504	473	245.1	40	RR5	93.0	100%	0.2	0.2	93.0	0%	0.0	0	40
R21	9504	475	72.2	0	RR5	4.1	100%	0.2	0.2	0.0	100%	4.1	1	1
R21	9504	476	1,185.1	4	RR5	19.1	100%	0.2	0.2	19.1	0%	0.0	0	4
R21	9504	478	9.6	0	RR5	6.6	100%	0.2	0.2	0.0	100%	6.6	1	1
M15	9504	482	22.0	7	RR10	6.5	100%	0.1	0.1	6.5	0%	0.0	0	7
M15	9504	484	4.4	0	RR10	4.4	100%	0.1	0.1	0.0	100%	4.4	0	0
M15	9504	485	32.9	8	RR10	4.7	100%	0.1	0.1	4.7	0%	0.0	0	8
M15	9504	486	70.7	10	RR10	13.4	100%	0.1	0.1	13.4	0%	0.0	0	10
M15	9504	488	53.1	21	RR10	37.6	100%	0.1	0.1	37.6	0%	0.0	0	21
M15	9504	502	9.9	5	RR10	7.1	100%	0.1	0.1	7.1	0%	0.0	0	5
M15	9504	504	126.0	33	RR10	16.6	100%	0.1	0.1	16.6	0%	0.0	0	33
M15	9504	506	4.9	2	RR10	1.4	100%	0.1	0.1	1.4	0%	0.0	0	2
M15	9504	508	7.7	9	RR10	11.3	100%	0.1	0.1	11.3	0%	0.0	0	9
M15	9504	509	3.0	0	RR10	2.5	100%	0.1	0.1	0.0	100%	2.5	0	0
M15	9504	510	37.6	6	RR10	14.9	100%	0.1	0.1	14.9	0%	0.0	0	6
M15	9504	511	8.6	2	RR10	4.7	100%	0.1	0.1	4.7	0%	0.0	0	2
M15	9504	514	26.2	4	RR10	3.8	100%	0.1	0.1	3.8	0%	0.0	0	4
M15	9504	515	31.9	25	RR10	40.4	100%	0.1	0.1	40.4	0%	0.0	0	25
M15	9504	516	42.7	59	RR10	39.4	100%	0.1	0.1	39.4	0%	0.0	0	59
M15	9504	517	16.1	14	RR10	13.0	100%	0.1	0.1	13.0	0%	0.0	0	14

ABLE .ESIDENTIAL LAND (OUTSIDE URBAN AREAS)

cation: Curry County

Polygon Descriptor Number	Census Tract	Census Block	Census Block Acres	Census Block Res. Units (Existing)	Zoning Type	Res. Acres by Zone	Percent of Total Res.	Allowable Density (units/acre)	Average Density (units/acre)	Developed Res. Acres	Percent Vacant	Vacant Res. Acres	Potential Buildable Units	Maximum Allowed Units
M15	9504	518	8.4	11	RR10	8.4	100%	0.1	0.1	8.4	0%	0.0	0	11
M15	9504	519	6.4	8	RR10	6.4	100%	0.1	0.1	6.4	0%	0.0	0	8
TOTAL	N/A	N/A	N/A	4,038	N/A	9,016	N/A	N/A	N/A	7,365	N/A	1,707	443	4,442

LE 3: SUMMARY TABLE - RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL LAND OUTSIDE OF URBAN AREAS

Location: Curry County

	Total Residential Acres	Vacant Residential Acres	Census Block Res. Units (Existing)	Potential Buildable Units	Maximum Allowed Units	Total Commercial Acres	Vacant Commercial Acres	Leasable Commercial Square Feet	Total Industrial Acres	Vacant Industrial Acres
TOTAL	**9,016**	**1,707**	**4,038**	**443**	**4,442**	**927**	**586**	**9,790,799**	**218**	**120**

APPENDIX D

PETITION FOR CENTER TURN LANE

PLEASE SIGN FOR "TURN LANE"

PETITION FOR CENTER TURN LAND HARBOR AREA

WE THE UNDERSIGNED REQUEST THAT THE OREGON DEPARTMENT OF TRANSPORTATION EXTEND THE CENTER TURN LANE ON HIGHWAY 101 IN HARBOR FROM ITS PRESENT TERMINUS SOUTH OF PEDROLI LANE TO THE OREGON/CALIFORNIA STATE LINE. A CENTER TURN LANE WOULD ENABLE LEFT TURNING TRAFFIC A (RELATIVELY) SAFE REFUGE WHILE WAITING FOR ONCOMING TRAFFIC TO CLEAR. THIS WOULD GREATLY IMPROVE THE SAFE PASSAGE OF PEOPLE, GOODS AND SERVICES ALONG THIS IMPORTANT CORRIDOR.

WITH THIS IMPROVED TRAFFIC FLOW, NO ACCESS CLOSURES WOULD BE NEEDED. PRESENT INGRESS AND EGRESS TO PRIVATE PROPERTY WOULD BE MAINTAINED. WE UNDERSTAND THE CURRENT ODOT RIGHT OF WAY AREA WILL ACCOMMODATE THE CONTINUATION OF THE CENTER TURN LANE. NO FURTHER ACQUISITION OF LAND WILL BE NECESSARY.

PRINT NAME	SIGNATURE	ADDRESS
LEE D MYERS	Lee D Myers	15657 Hwy 101 SO.
ANONA L. NOORDMAN	A L Noordman	1233 Rowland Ln
DAVID SNATZK		28565 Emerald Dr Gold Beach
Christina Linton	Chris Linton	1229 Dixie St Harbor OR
Bettie Jackson	Bettie Jackson	1214 Moore St BKS.
Laurel Fubry	Laurel Fubry	PO 1032 Gold Beach
Vanita Crabtree		262 Y 8 Alta Vista Harbor City CA
Catherine Appold		98354 Thomas Lane Brookings, OR 97415
Darrin Rose		27338 Rocky Pt Rd Klamath Falls OR 97601
Caribel Tayes		Box 1657 Brookings, OR 96090 70 x Glove Wy.
Drucella A McKinnon	Drucella A McKinnon	PO. Box 763 Brookings Or.
ELAINE BERN		PO Box 1794 Brookings
Nancy Myers	~~Nancy Myers~~	~~15657 Hwy 101 S. Brookings~~
Michael J Coffey		1427 Anzio Crescent City CA.
Leroy Reed		P O Box 4049 Brookings, OR

PRINT NAME	SIGNATURE	ADDRESS
Beverly CLARK	Beverly Clark	PO Box 246 Hiouget-CA 95543

PETITION FOR CENTER TURN LAND HARBOR AREA

WE THE UNDERSIGNED REQUEST THAT THE OREGON DEPARTMENT OF TRANSPORTATION EXTEND THE CENTER TURN LANE ON HIGHWAY 101 IN HARBOR FROM ITS PRESENT TERMINUS SOUTH OF PEDROLI LANE TO THE OREGON/CALIFORNIA STATE LINE. A CENTER TURN LANE WOULD ENABLE LEFT TURNING TRAFFIC A (RELATIVELY) SAFE REFUGE WHILE WAITING FOR ONCOMING TRAFFIC TO CLEAR. THIS WOULD GREATLY IMPROVE THE SAFE PASSAGE OF PEOPLE, GOODS AND SERVICES ALONG THIS IMPORTANT CORRIDOR.

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PRINT NAME	SIGNATURE	ADDRESS
BILL ROGERS	Bill Rogers	98522 Camellia Dr, Harbor
MARY E. Rogers	Mary E Rogers	98522 Camellia Dr. Harbor

THIS PETITION WILL BE PRESENTED TO ODOT REGION 3 PLANNERS AND THE SOUTH COAST TRANSPORTATION COMMITTEE DURING THEIR STUDY PERIOD (NO LATER THAN FEBRUARY 15, 1998).

PETITION FOR CENTER TURN LANE HARBOR AREA

WE THE UNDERSIGNED REQUEST THAT THE OREGON DEPARTMENT OF TRANSPORTATION EXTEND THE CENTER TURN LANE ON HIGHWAY 101 IN HARBOR FROM ITS PRESENT TERMINUS SOUTH OF PEDROLI LANE TO THE OREGON/CALIFORNIA STATE LINE. A CENTER TURN LANE WOULD ENABLE LEFT TURNING TRAFFIC A (RELATIVELY) SAFE REFUGE WHILE WAITING FOR ONCOMING TRAFFIC TO CLEAR. THIS WOULD GREATLY IMPROVE THE SAFE PASSAGE OF PEOPLE, GOODS AND SERVICES ALONG THIS IMPORTANT CORRIDOR.

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PRINT NAME	SIGNATURE	ADDRESS
Janet A Rowland	Janet A Rowland	408 Smith Rd Brkgs Ore
Margaret Bosse	Margaret Bosse	98090 W Benham Ln Harbor
Joy Green		P.O. Bx 1809 Brookings Or 97415
Louise Phinney		16063 Driftwood Ln #45, Brookings
Carol Wheeler		16063 Driftwood Ln #22 Brookings
Margaret J Hively	Margaret J Hively	97156 Dodge Ave #, Brookings
RENEE FENTON-WAGNER	Renee Fenton-Wagner	14683 Williams Rd Brookings
BARBARA FITZSTEPHENS		PO BOX 535 GOLD BEACH 97444
Elden Grossen		98 Tanbark Brookings OR 97
Phil Anderson		16034 Carson Ln 97415
Sally A Kaser	SALLY A KAISER	98998-W Freeman 7206
Thea Pendarvis		15639 Winriver Rd Brookings OR 974
Roger Moody		"
Phill Smith		14377 Hwy 101 So. Harbor

THIS PETITION WILL BE PRESENTED TO ODOT REGION 3 PLANNERS AND THE SOUTH COAST TRANSPORTATION COMMITTEE DURING THEIR STUDY PERIOD (NO LATER THAN FEBRUARY 15, 1998).

PETITION FOR CENTER TURN LAND HARBOR AREA

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PRINT NAME	SIGNATURE	ADDRESS
CAROL CHIADO	Carol A. Chiado	15520 Hwy 101 South, Brookings, Or.
DEBORAH HAYES	Deborah Hayes	16212 Tolman Ln. #1 Harbor, Or.
JOHN HEDDING	John Hedding	15546 Hwy 101 So. BROOKINGS, OR.
GAIL DEDDING	Gail O. Dedding	15546 Hwy 101 So. Brookings, O
[illegible]	[illegible]	155 Rose Ln Smith River
Lyman Tubbs	[illegible]	P.O Box 1672 Brookings
Julia Joy Pierre Pontt	[illegible]	521 First Street, A Brooki
Conrad Repp	[illegible]	403 Knoll, Brookings
Shirley L. Hamilton	[illegible]	403 Knoll Lane Brookings
BLAKE HARDWICK	Blake Hardwick	1108 Rowland Ln BROOKINGS
Jacquelin Hardwick	Jacqueline Hardwick	1108 Rowland Ln Brooking
Danny Houk		97082 Hilltop Dr Brookin
Wendy L. Rogers	W. L. Rogers	POB 6728 Brookin
James M. Rogers	[illegible]	" " "
Carol Harms	Carol Harms	00366 Winchuk Brookin

THIS PETITION WILL BE PRESENTED TO ODOT REGION 3 PLANNERS AND THE SOUTH COAST TRANSPORTATION COMMITTEE DURING THEIR STUDY PERIOD (NO LATER THAN FEBRUARY 15, 1998).

PETITION FOR CENTER TURN LAND HARBOR AREA

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PRINT NAME	SIGNATURE	ADDRESS
BARBARA LOWDEN	Barbara L Lowden	14626 WILLAMS RD BKGOR
RAYMOND J. PLUTA	Raymond J Pluta	15870 PELICAN BAY DR. BKGOR
~~Robert A Miller~~		
MARY E (CASTON)	Mary E Caston	15526 Hwy 101 S

THIS PETITION WILL BE PRESENTED TO ODOT REGION 3 PLANNERS AND THE SOUTH COAST TRANSPORTATION COMMITTEE DURING THEIR STUDY PERIOD (NO LATER THAN FEBRUARY 15, 1998).

PETITION FOR CENTER TURN LANE HARBOR AREA

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WITH THIS IMPROVED TRAFFIC FLOW, NO ACCESS CLOSURES WOULD BE NEEDED. PRESENT INGRESS AND EGRESS TO PRIVATE PROPERTY WOULD BE MAINTAINED. WE UNDERSTAND THE CURRENT ODOT RIGHT OF WAY AREA WILL ACCOMMODATE THE CONTINUATION OF THE CENTER TURN LANE. NO FURTHER ACQUISITION OF LAND WILL BE NECESSARY.

PRINT NAME	SIGNATURE	ADDRESS
PAT STEWART	Pat Stewart	PO Box 1144 Brookings OR
Shelley Ross	Shelley Ross	P.O. Box 516 " "
BRUCE STEWART	Bruce Stewart	P.O. Box 1144 " "
TL GOSE	T. Gose	POB 2442 Harbor OR
J E Gordin	J E Gordin	Riverside Tr. #1
Rachael Robertson	Rachael M Robertson	18955 Pacific Crest, Brookings
Daniel Moore	Daniel Moore	PO BOX 399 Brookings
WALTER HOFFLIN	Walter M. Hoffln	PO BOX 2677 HARBOR
Gloria Joy Miller	Gloria Joy Miller	P.O. Box 2689 Harbor
Anna Steeling		1331 Crissey Circle Brkgs.
Cecelia Tue	Cecelia Tue	220 Cypress St Brkgs
Helen-Jane McCabe	Helen-Jane McCabe	15545 Pedroli Brookings
JOAN ZEISEMAN	Joan Zeiseman	15702 NAPA LN Harbor
SUSAN L. WILLIAMS		PO BOX 885 Brookings OR
MARK COX	Mark Cox	P.O. Box Brookings OR

THIS PETITION WILL BE PRESENTED TO ODOT REGION 3 PLANNERS AND THE SOUTH COAST TRANSPORTATION COMMITTEE DURING THEIR STUDY PERIOD (NO LATER THAN FEBRUARY 15, 1998).

PETITION FOR CENTER TURN LANE HARBOR AREA

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PRINT NAME	SIGNATURE	ADDRESS
ELAINE Righetti	Elaine Righetti	1049 Old County Rd
ROGER LILES	Roger Liles	15695 WINRIVER RD.
GARY FLETCHER	Gary Fletcher	CRESCENT C.ty Ca.
Glenda Weber	Glenda Weber	Crescent City Ca
Carolyn Crowley	Carolyn Crowley	SMITH RIVER CA
Darrel Lynch	DARREL LYNCH	PO Box 1393 CRESCENT C.TY CA
Richard Moore	Richard Moore	99323 Winchuck River Rd. Brookings Or
Raymond Newman	Raymond Newman	98158 W Alder Dr Brookings
HARRY MASON	Harry Mason	16230 IVY LANE HARBOR OR.
Valorie Tippman	Valorie Tippman	14185 Hwy 101 N, SR
Alvin Kistemaker	ALVIN KISTEMAKER	32909 Nesika Rd Gold Beach
MARIE KISTEMAKER	Marie Kistemaker	" " " " 97444
Melanie Eaton	Melanie Eaton	P.O. Box 311 Brookings
DEBBIE GRIFFITH	Debbie Griffith	PO Box [illegible]
HARLAN MITTS	Harlan Mitts	99366 Winchuck River Rd

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PETITION FOR CENTER TURN LAND HARBOR AREA

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PRINT NAME	SIGNATURE	ADDRESS
Todd Small		99293 Hendry Lane
Jack Tellefsen	Jack Tellefsen	16063 Driftwood Ln, Brkgs 97415
Susan Cuca		17305 Crissey Rd. Ca 95567
Larry Anderson		1351 Glenmus Dr. Brkgs
Barbara Castle	Barbara Castle	15333 Hwy 101 S. Brookings
Allen Castle	allen Castle	15333 Hwy 101 S. Brookings
Keith Smith		PO B 2792 HARBOR, OR 469767
LARRY BRUNSON		P.O. BOX 1304 BROOKINGS
Myrtle R Woods		P.O. Box 1204 Brookings
L. Lee Rogers		B1 Marine Dr Brkgs
Ron Pizzini		98368 Cougar Dr. Brkgs
Kent R Miller		97835 Chetcoe Lane Harbor Or. 97415
H.M. Hansen	H. M. HANSEN	97832 Titus Ln. Brkgs.
Sidney R Beeching	Sidney R. Beeching	00192 Lawrence Lane Brookings Ore 97415
C Jones		PO. 22 Bk. Or.

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PRINT NAME	SIGNATURE	ADDRESS
Carol L Crockett	Carol L. Crockett	15760 Hwy 101 S.
Cindy C Freeman	Cindy C Freeman	15272 Hwy 101 S Harbor OR
Rafael Villagrana	Rafael Villazana	15130 Hwy 101 S. Harbor OR
Susan M Freeman Scott	S.M. Freeman Scott	P.O. Box 2957 HARBOR
David E Scott	David E. Scott	PO Box 2957 Harbor, OR 974

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PRINT NAME	SIGNATURE	ADDRESS
Dorothy Williams	Dorothy Williams	14714 Sandpiper, Brookings OR
Charlene Kelly-Hyn	Charlene Kelly-Hyn	14679 Hyn Dr Brookings
Marleen A. Olive	Marleen A. Olive	18241 Taylor Ct. Rd., Brk
Priscilla H. Bircher	Priscilla H. Bircher	P.O. Box 7876, Brookings
Cynthia Speakman	Cynthia Speakman	15608 Hwy 101 S Brookings
Lou Ann Hampton	Lou Ann Hampton	15753 Hwy 101 S. Brookings
Diana Ohmann	Diana Ohmann	00289 Lobinchuck Ln. Brookings
Eloise Elliott	Eloise Elliott	200 Macklyn Cove, Brookings
Yvonne Young	Yvonne Young	96729 De Moss, Brookings
Nancy Pettet	Nancy Pettet	Box 3214, Harbor
Helen Testerfield	Helen Testerfield	PO Box 1060 Brookings
Richard H. Pendleton	Richard H. Pendleton	15608 Hwy 101, Harbor
Peggy J. Mory	Peggy J. Mory	P.O. Box 338 Harbor
Nancy Gossett	Nancy Gossett	15348 Hwy 101 S. Harbor
Virginia Petersen	Virginia Petersen	204 Alder S. Brookings

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PRINT NAME	SIGNATURE	ADDRESS
Archie McVay	Archie McVay	Box 2126 Harbor
Glenda Brockway	Glenda Brockway	PO Box 2983 Harbor
Lee D Myers JR		15661 Hwy 101 S Brookings
WILLIAM G RAMSEY JR.	William G Ramsey Jr.	17812 AQUA VISTA LN.
Chris Bowers	Chris Bowers	P.O Box 1942 Brookings OR.
JUDY SMITH	Judith A Smith	PO Box 842 Brookings OR
Tony Watts	Tony Watts	Smith River
Tim DeWitt	Tim DeWitt	SMITH RIVER P.O. Box 83-G 95567
Maribeth Pitts-Campbell	Maribeth Pitts-Campbell	Smith River CA
Mary F Bowers	Mary F Bowers	PO Box 1942 Brook
Linda Wheeler-Rose	Linda Wheeler-Rose	95729 Horton Ln., Bro
Donald G. Oliver	Donald G Oliver	622 Ransom Ave Apt A.
Cindy Drakeim -	Cindy Drakeim	719 4th St-Brooking
Terry C. Hanson	Terry C Hanson	00243 W Lake Rd Bo
KATHY KESLER	Kathy Kesler	Box 7184 Brookings

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PRINT NAME	SIGNATURE	ADDRESS
Zach Kosel		630 Meadow Lane
[illegible]		
Thayne Groff	Thayne Groff	PO Box 7365 Brookings
Daniel Fraser	Daniel R Fraser	99355 P.O. Box 1743 Brookings Braynard Ln. Brookings
Donna J. Fraser	Donna Fraser	P.O. Box 1743 Brookings Ore. 99355 Braynard Ln. Brookings
ALFRED F. WUNTZ	Alfred F Wuntz	15611 Oceanview Dr Brookings
CARL TOBIN	Carl Tobin	CAMEO CT BROOKINGS
Clayton Berg		97377 Brookings
Ken D Rogers		BROOKINGS 96925 SUEDE LN
[illegible] Addison		BROOKINGS
Eugene E. Rice		Brookings Or
Mark G. Johnson		P.O. 7140 BROOKINGS ORE.
Tony Ricci	Tony Ricci	98459 Yon Pl. Brookings.
JAMES WHITSETT	James Whitsett	Box 3216, BROOKINGS
Byron Gerlach	Byron Gerlach	15266 Hwy 101 S Brookings

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PRINT NAME	SIGNATURE	ADDRESS
M.Y. DARRIEULAUT	M.Y. Darrieulaut	1223 MOORE ST. #16, BKGS
Ronda VanVliet	Ronda VanVliet	19215 Sunrise Lane BKGS
Joseph R. Knapp	Joseph R Knapp	96134 Foxglove Way Brookings
BILL NEBUS		16035 BOAT BASIN BROOKINGS
LEE RIDDLE		96370 WILDWOOD BROOKINGS
Don McDaniel		95804 ELDORADO BROOKINGS
TOM GIRARD		97886 TITUS DRIVE HARBOR
DEANNA R. GILL	Deanna R Gill	17350 CANYON DR. BKGS
TIM MCMASTER		99757 SOUTH BANK RD.
Clayton J Metzel Sr	CLAYTON J METZEL	97415 Brookings
Paul Placido		284 Winchuck R.R. Rd Harbor
FRANCES L. LUCAS	Frances L Lucas	98203 S BANK RD #21 BROOKINGS OR 97415
Michael S. Cooper		1228 Moore St. Brookings, Or 97415
Mary K. Cooper	Mary K. Cooper	1228 Moore St. Brkgs 9741
Donna J. Tuma	Donna J Tuma	17440 Mountain Dr. BKGS 97415

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PETITION FOR CENTER TURN LAND HARBOR AREA

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PRINT NAME	SIGNATURE	ADDRESS
4/e Coleman	Dale Coleman	Box 1026 Brookings 97415
ERTHA WRIGHT	Bertha Wright	Box #224 Harbor, Ore. 97415
To-cc Kowalewski	Joyce A. Kowalewski	805 Kevin Pl. Brookings
	Ronald A Cotta	Brookings, 97415
FRANK CALTA		15668 PELICAN BAY DR HARBOR OR
8 Bill Askin	Bill Askin	95944 Cape Ferrelo, Brookings, OR
		PO Box 608 Brookings Or
Norma E. Smith	Norman E Smith	98559 Woodruff Ln. Or.
		15522 Winchuck RR Brookings
Albert F Giddings		P.O. 1858 - Brookings, Or 97415
Robert A Bath		16776 Cornet Rd Brookings 97415
Ginger Rossi	Ginger Rossi	PO Box 1692 Brookings Or 97415
Dick Knutson		16970 Ferry Creek Hgts. Brookings 97415
Rachel A Hays		96020 Sundown Brookings 97415
Diana R Hays		96080 Sundown Brookings OR

THIS PETITION WILL BE PRESENTED TO ODOT REGION 3 PLANNERS AND THE SOUTH COAST TRANSPORTATION COMMITTEE DURING THEIR STUDY PERIOD (NO LATER THAN FEBRUARY 15, 1998).

LANE
PETITION FOR CENTER TURN LANE HARBOR AREA

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PRINT NAME	SIGNATURE	ADDRESS
Marilyn R. Riddle	Marilyn R. Riddle	547 Spruce St. PO Box 286 Brookings, OR 97415
Sharon Flores	Sharon Flores	15510 Cedar Ln.
Linda Ferguson	Linda Ferguson	98131 W. Benham
Teresa Norman	TERESA NORMAN	515 Pacific Ave POB 6703 Brookings, Or. 97415
Valeria Smith	Valeria Smith	805 Camino Ct Brookings
Hazel Gudger	Hazel Gudger	924 Carl Ln Brookings OR 97415
JACK E SHIMMIN	Jack E. Shimmin	P.O. Box 1447 Brookings OR 97415
FRANCES L. Shimmin	Frances L. Shimmin	PO Box 447 Brookings OR 97415
Irene Silva	15502 Morrison Ln	Brookings Harbor 97415
Gail Tausch	GAIL TAUSCH	P.O. Box 6692, 325 Ranson Brookings, OR. 97415
HELEN HOWARD	Helen Howard	93516 Woodcliff Rd Brookings Or 97415
CAROL FLEGGE	Carol Flegge	16281 Terrace Brookings
DOLORES LIEWERGEN	Dolores Liewergen	1484 Glenwood Dr. Brookings
RAMONA A. FIX	Ramona A. Fix	407 Lindley Ln. Brks
CORNELIA R. JONES	Cornelia R. Jones	15859 Sea Cliff Brookings, Ore.

THIS PETITION WILL BE PRESENTED TO ODOT REGION 3 PLANNERS AND THE SOUTH COAST TRANSPORTATION COMMITTEE DURING THEIR STUDY PERIOD (NO LATER THAN FEBRUARY 15, 1998).

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PRINT NAME	SIGNATURE	ADDRESS
Hazel Austin	Hazel Austin	16123 Kings WAY HARBOR
Lois Reed	Lois M. Reed	15848 Pelican Bay Brookings
Shirley J Sudduth	Shirley J Sudduth	95880 Eggusse Brookings.
INGRID F. HEMINGER	Ingrid F. Hemingr	96335 WILDWOOD ORRGS
Lorraine Woods	Lorraine Woods	P.O Box 7097 Brookings
Evelyn Allen	Evelyn Allen	204 Alta Lane Brookings
Mary E Garinger	MARY GARINGER	00816 WINCHUCK BROOKINGS
Alice Pierson		1012 Easy Brook Brookings
Pauline Olsen		319 Memory Brookings
Elizabeth James		00846 Wenchuck
Kate Rankin		Box 7439 Brookings
Marie Kern		102 Schooner Bay Dr - Brookings
FLORENCE HENRY	Florence Henry	418 2nd St Brookings

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PRINT NAME	SIGNATURE	ADDRESS
MARVIN ELOGE	Marvin Eloge	PO Box 7708 Brookings OR 97415
Teresa Hoel	Teresa Hoel	17545 Surprize Ln. Brookings OR 97415
ROBERT E. RATH	Robert E Rath	15243 Ocean View Dr. Brookings
Lee Smith	Lee Smith	98645 Camellia Dr. Brookings
RICK OLIVER	Richard W Oliver	97945 PAYNE RD HARBOR
Sharon Anderson	Sharon Anderson	96049 Casey Ln Brookings
Chuck Wallis	CHUCK WALLIS	96049 Casey Ln Brookings
Tracy Baker	Tracy Baker	P.O. BOX 744 Brookings
James A. Barnett	James A Barnett	PO Box 179 Brookings
Gene Handley	GENE HANDLEY	5700 S. BANK RD CA
JIM HARNESS		355 SPRUCE DR. BKS
Nancy M McClelland	Nancy M McClelland	96363 Wildwood Rd Brookings OR
David A. Thomas	D. C. THOMAS	97990 N BENHAM LN SP 21 Brookings OR
William E. Turner	William E Turner	17440 Mountain Dr. Brookings
ROBERT E. WEAST	Robert E. Weast	P.O. BOX 1450 BROOKINGS, OR

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PRINT NAME	SIGNATURE	ADDRESS
Rob Miller		11885 Oceanview Dr S.R Ca
Rick Oliver	Rick Oliver	97943 Payne Rd Harbor OR.
John Westbrook		501 NW Westbrook Dr S.R Ca 95567
LEE RIDDLE		96370 WILDWOOD RD BROOKINGS OR 9741
Don Crockett		589 Fred Hunsaker Dr Smith River C 95567
Gary Derr	Gary M Derr	508 Hassett St, Brookings, OR. 97415
Walter G. Schroeder	Walter G Schroed	95102 Rogue River Hts, Gold Beach, OR 97444
DAVID G. ITZEN		15629 PERKINS RD, BROOKINGS OR 97415
HARRY A. HARMS		00366 Winchuck River Rd Brookings Ore 974
JOHN W. McLOUGHLIN	John W. McLoughlin	8233 RIVERBANKS Rd, GRANTS PASS, OR 97527
Raymond York		15696 Hwy 101 So Brookings Or.

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WE THE UNDERSIGNED REQUEST THAT THE OREGON DEPARTMENT OF TRANSPORTATION EXTEND THE CENTER TURN LANE ON HIGHWAY 101 IN HARBOR FROM ITS PRESENT TERMINUS SOUTH OF PEDROLI LANE TO THE OREGON/CALIFORNIA STATE LINE. A CENTER TURN LANE WOULD ENABLE LEFT TURNING TRAFFIC A (RELATIVELY) SAFE REFUGE WHILE WAITING FOR ONCOMING TRAFFIC TO CLEAR. THIS WOULD GREATLY IMPROVE THE SAFE PASSAGE OF PEOPLE, GOODS AND SERVICES ALONG THIS IMPORTANT CORRIDOR.

WITH THIS IMPROVED TRAFFIC FLOW, NO ACCESS CLOSURES WOULD BE NEEDED. PRESENT INGRESS AND EGRESS TO PRIVATE PROPERTY WOULD BE MAINTAINED. WE UNDERSTAND THE CURRENT ODOT RIGHT OF WAY AREA WILL ACCOMMODATE THE CONTINUATION OF THE CENTER TURN LANE. NO FURTHER ACQUISITION OF LAND WILL BE NECESSARY.

PRINT NAME	SIGNATURE	ADDRESS
Peggy S. RASKA	Peggy S. Raska	16219 Lo. HARBOR RD.
Julie A. Kleese	Julie A. Kleese	538 Memory Ln. P.O. Box 7924 Br
Franklin D. Chinde	Franklin D Chinde	15520 Hwy 101 So. Brookings
Robert A Miller	Robert A Miller	15629 Pelican Bay Dr

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PRINT NAME	SIGNATURE	ADDRESS
Terri Parker	Terri Parker	PO Box 2643 98431 Kopia Harbor OR
William A Parker	William A Parker	PO Box 2643 98431 Robin Ln.
Jay Weiss	Jay Weiss	416 N.W. Pleasant View
BOB LEWIS	Bob Lewis	ROSEBERG, OR
Deloss Shurtleff	Deloss Shurtleff	98698 Woodruff Ln Harbor OR
Peggy Murabal	Peggy Murabal	12400 Highway 199 Smith River Ca 95567
William Smith	William Smith	820 Highland Ave, Brookings, OR 97415
Mary Jean James		Crescent City, Ca
Brian Dunn	2780 Crooked Creek Rd	Eagle Point Oregon

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PRINT NAME	SIGNATURE	ADDRESS
	Ron Wimberly	14788 Hwy. 101 S. Harbor, Or. 97415
	[illegible]	2603 Williams Hwy Grants Pass Or 9780[illegible]
	Marilyn Dearde	539 Chetco Ave. Sutter Coast Hospice Brookings 469-1828
	Lynn Scott	LYNN SCOTT 1009 EASY ST. 412-0727
16 EWALD HOPFENZITZ	Ewald Hopfenzitz	1444 Glenwood DR OR
	Hunt[illegible]	P.O. Box 1137 Crescent City Ca
BEVERLY A DENNIS	Beverly A Dennis	19945 Whaleshead Rd Bkgs
Nancy Botta	Nancy Botta	Box 2974 Harbor, OR
SAMUEL A. Reitz	Samuel Reitz	2373 Greenbrook D - Medford, or
KATHLEEN REITZ	Kathleen Reitz	2373 GREENBROOK, MEDFORD, OR.
Margaret E. Herman	Margaret Herman	3311 Alameda St Medford
	Gayle Luckey	1690 Cloverlawn Dr Grants Pass Oregon
	Wesley [illegible]	418 Airport Rd Cave Junction OR
	Patricia Wickwid	301 Alta Ln. Brookings
	Marion L. Piper	665 Mardon, Brookings
	James T. Sonbon	7266 [illegible] Lane GRANT PASS OR.

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PRINT NAME	SIGNATURE	ADDRESS
Pat Reeder	Pat Reeder	Ft Dick Ca Lif.
Cathleen Lamb	Cathleen Lamb	96445 Coverdell Rd #6
Maria Albercheon	MARIA ALBERCHEON	375 S. Pebble Beach CC
Cheryl McGee	Cheryl McGee	PO Box 443 Fort Dick CA 95538
TERESA DERIGGI	Teresa A. DeRiggi	P.O. Box 670 Bkg
[illegible]	[illegible]	96741 DIMEY CRK RD BROOKINGS 97415
Edward Curtis	[illegible]	Box 4043 Brookings
LINDA ANDERSON	Linda Anderson	Brookings, Or.
Geraldine V. Halvorsen	Geraldine V. Halvorsen	Harbor OR.

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PRINT NAME	SIGNATURE	ADDRESS
JOHN D POYNZER JR.	John Poynzer	PO Box 2591
Jacqueline Cochran	Jacqueline Cochran	234 W 6th Crescent City
AL DAFT	Al Daft	Crescent City 95531
A. Denise Schweikl	A Denise Schweikl	PO Bx 153 Gasquet CA

(4)

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PRINT NAME	SIGNATURE	ADDRESS
Tim Winterstein	Timothy Winterstein	PO BOX 6575 Brooking
Jim Furlong	Jim Furlong	17744 Hwy 101 Brkgs
Dan STOKA	Tara STOKA	
Mark Scott	Marilyn Scott	17439 Alen Park Dr. Brookings 97415
Kelly & Charlie Salmon	98112 - OLSEN LN	BROOKINGS
Nancy De Sanz Bey	98466 S. BANNCHETCO	BROOKINGS
Kala Marie Carsten	98441 Raymond Lane	Brkgs
(16) Larry E Samuelson	PO Box 1867 98441 RAYMOND LANE	BRKGS
MARLYS BOYER	Marlys Boyer 15505 Oceanview #45	Brkgs
J. Lewin	Jennifer L Lewin 1140S N. St. Andrews	Scottsdale
Marc Cameron	M. Cameron 5975 PACKARD AVE. #8	LA 90019
James Daly	1115 DIANA AVE	MORGAN HILL CA
James Deskin	South Bank Rd	Crescent City Ca
Del Deskin		
Jerry Gale		Gilroy Ca
Sylvia Kemp	1115 Sandy Ln.	Brkgs OR.

THE SOUTH COAST TRANSPORTATION COMMITTEE DURING THEIR STUDY PERIOD (NO LATER THAN FEBRUARY 15, 1998).

APPENDIX E

MEMORANDUM OF UNDERSTANDING

MEMORANDUM OF UNDERSTANDING (MOU)
between
CITY OF BROOKINGS COMMISSIONERS, CURRY COUNTY, OREGON
(hereinafter called "the City")
and the
U.S.D.A. FOREST SERVICE, SISKIYOU NATIONAL FOREST
(hereinafter called "the Forest")

SECTION I. STATEMENT OF PURPOSE

The purpose of this Memorandum of Understanding (MOU) is to establish government-to-government communications and productive planning relationships between the City and the Forest. This MOU addresses how and when each agency participates in Forest and City planning processes. Successful implementation of this MOU will promote positive intergovernmental relationships.

SECTION II. BACKGROUND

A. WHEREAS, it is recognized that the Forest Service manages the National Forest in accordance with the Organic Administration Act of 1897, The Multiple Use Sustained Yield Act, and the Forest and Rangeland Renewable Resources Planning Act as amended by the National Forest Management Act (NFMA), and other acts. It makes planning decisions in accordance with the procedures established by the National Environmental Policy Act (NEPA), and;

B. WHEREAS, these Acts require management of National Forest System lands to provide renewable resources (outdoor recreation, range, timber, watershed, wildlife, and fish) on a sustained basis to ensure a continued supply of goods and services to the American people in perpetuity, and;

C. WHEREAS, the City and Forest policies seek to fully consider the impacts of proposed actions on the physical, biological, social and economic aspects of the human environment, including impacts at the local level, to involve each other in planning and monitoring of ultimate decisions made, to give early notice of upcoming proposals to interested and affected persons, and to give timely notice to each other regarding environmental planning documents, and;

D. WHEREAS, the Forest and the City desire to enter into this MOU and have the authority, through the Forest Supervisor and the City Commission, to do so, and;

E. WHEREAS, it is mutually recognized that:

1. This MOU shall not be construed to affect the jurisdiction of Federal, State, City or other local governmental agencies which exists as a matter of law, and:

2. The Forest encompasses several administrative units in the City known as Ranger Districts, and;

3. The City and Forest desire that their planning and enforcement activities appropriately consider the impacts of various decisions on the economic and social stability and culture of the City and its residents during planning.

F. WHEREAS, there are City and Forest planning activities which require different levels of documentation prior to decision making and implementation, and;

G. WHEREAS, for the Forest, these planning levels are mandated or recommended by various Federal laws, regulations and guidelines including, but not limited to, the NEPA, the NFMA, and Forest Service policies, procedures and regulations.

H. WHEREAS, the City has planning activities mandated by State and local laws, and;

I. WHEREAS, it is understood that the Forest has responsibility and authority for decisions on matters within its jurisdiction, and;

J. WHEREAS, it is understood that the City has responsibility and authority for decisions on matters within its jurisdictions.

SECTION III. STATEMENT OF JOINT OBJECTIVES

A. WHEREAS, both agencies desire to develop processes and procedures to ensure that the City and the Forest are able to efficiently and effectively meet their responsibilities as public entities, and;

B. WHEREAS, both agencies desire to openly communicate and provide a conduit for free exchange of information on common issues and problems, and;

C. WHEREAS, both agencies desire to provide a framework to fully consider the social, economic, environmental, and cultural impacts of public land and resource management decisions as part of the overall planning and decision making processes, and;

D. WHEREAS, both agencies desire to work cooperatively on monitoring Forest Plan implementation, and;

E. WHEREAS, both agencies desire periodic review of this MOU for evaluating its effectiveness, and;

F. WHEREAS, both agencies desire a conflict resolution process, and;

G. WHEREAS, both agencies desire to provide conflict resolution processes at the lowest administrative level without resort to judicial review.

NOW, THEREFORE BE IT UNDERSTOOD THAT the parties shall work in good faith to implement the following:

SECTION IV. PROJECT LEVEL PLANNING UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT

A. Initiate Planning

1. The processes set forth in this MOU are intended to portray the most complex, interactive analysis which the agencies may be required to undertake in complying with their respective responsibilities. Many actions proposed by the Forest, either initiated by the Forest or from an applicant, including the City, may be processed and final disposition made using fewer procedural steps than this process provides.

2. The Forest Responsible Official ensures compliance with all matters pertaining to the NEPA and consistency with the Forest Plan pursuant to the NFMA and all other federal laws.

B. Schedule of Proposed Actions

1. The Forest will mail the quarterly Environmental Analysis Schedule of Proposed Actions (SOPA) to the Chair of the City Commission. This calendar provides the status of all ongoing and proposed environmental analyses on the Forest.

2. The City will monitor the schedule and be prepared to act promptly upon receipt of Scoping letters or other documents from the Forest requesting City actions or comments.

C. Scoping

1. The Forest shall notify the City at the earliest possible time of environmental analyses affecting the City. Notification shall occur through the Schedule of Proposed Actions and through scoping documents related to individual analyses. For analyses documented in Environmental Assessments (EAs) and Environmental Impact Statements (EISs), the Forest shall mail the scoping document to the Chair of the City Commission. The scoping document will normally include a description of the proposed action, a statement of purpose and need, and decisions to be made. When appropriate, the scoping document may include preliminary issues, possible alternatives, and the status of the City as a cooperating agency or joint leader in the analysis. For analyses documented as Categorical Exclusions, the Forest shall scope with the City in a manner commensurate with the requirements of individual analyses.

2. The City will evaluate the scoping document and refer it to the appropriate advisory committee(s) for prompt consideration and action. The City will, within the response time specified in the scoping document, either provide written comments on the proposal or inform the Forest in writing of one of the following:

a. The City has no outstanding concerns with a special interest in the proposal and does not intend to comment further. The City may request to receive the Decision Memo (DM), EA or EIS even though they have expressed that they have no outstanding concerns. This request must be made in writing. It is understood that the City's non-response to the scoping report as well as lack of any other expression of interest constitutes tacit notification that it has no concern over the project. These actions or lack of action may cause the City to lose standing to appeal the decision under the Forest Service appeal regulation (36 CFR 215.15(a)(5)).

b. If the City desires additional information it may request the Forest to meet with the advisory committee(s) and other City staff. This meeting shall be a public meeting conducted in accordance with Federal, State, and local law. Issues, alternatives and/or mitigation measures may be presented to the Forest by the City at this time.

c. The City is interested in participating in the project. The response will include suggested issues, alternatives and/or mitigation measures and its desired role and participation activities.

3. In response to the scoping document, the City will make a good faith effort to raise any and all issues it deems important in as specific a manner as possible. The City shall describe applicable State and local laws and local plans and policies which may apply to the proposal or have an effect on the decision.

4. The Forest or the City may request a meeting to clarify individual project goals and objectives and/or pertinent issues. The City will, to the greatest extent possible, organize and conduct these meetings to keep the subject focused on the specific issues and project. The City will cooperate with the Forest on scheduling these meetings and providing adequate notice in compliance with State law. Both agencies may request persons with special expertise to attend such meetings to present and discuss information.

5. The City Commission will provide the City's issues and concerns to the Forest Responsible Official in writing within the specified time periods. The City may also recommend appropriate mitigation measures and alternatives pertinent to their issue(s) at this time.

6. Both agencies are responsible to ensure that all available information pertinent to the City's issues is specific and accurate.

7. The Forest shall consider in their analyses issues resulting from the proposed action which affect City plans and policies. These issues will be evaluated with respect to their significance as described by the Council on Environmental Quality Regulations and shall be discussed in a manner commensurate with their significance in the EA or EIS.

D. Notification and Comment Procedures

1. At this point in the process, procedures identified in the Forest Service appeals regulations for comment and decision notification (36 CFR 215) will apply.

2. The Forest Responsible Official shall mail a copy of any EA, EIS and notices of availability to the City for any projects for which it has indicated an interest.

3. The Forest Responsible Official shall mail written notice of decisions to the City on all actions for which it has indicated an interest.

SECTION V. JOINT AND COOPERATIVE PLANNING

A. Joint Planning

1. The Forest Responsible Official and the City shall agree when joint planning is appropriate and how such planning shall be conducted.

2. Joint planning may be used for:

a. Activities for which the City has subject matter jurisdiction (40 CFR 1506.2(b)),or;

b. Activities for which the City has environmental planning requirements comparable to NEPA (40 CFR 1506.2(c)).

3. When the City requests to conduct joint planning (40 CFR 1506.2), it shall demonstrate that joint planning is required or appropriate. A critical element for determining when joint planning is warranted is whether a decision or independent approval is required by both agencies.

4. The demonstration justifying joint planning must clearly show that:

a. The City has undisputed authority to make a decision directly related to the proposed action in accordance with 40 CFR 1506.2(b), or;

b. There is statutory authority both for the City's decision making responsibility and for the joint planning activity requested. The City must cite the specific laws and regulations which provide the basis for the request.

5. If the requirement for joint planning is in dispute, the City and the Forest Responsible Official will use the process outlined in Section X. CONFLICT RESOLUTION.

B. Cooperating Agency Status

1. The Forest Responsible Official shall have the authority to grant cooperating agency status (40 CFR 1508.5). The City has the same authority for initiating cooperative planning with the Forest for City decisions under appropriate provisions of its local ordinances or regulations.

2. Cooperating agency status is appropriate when it would serve to assist both agencies in complying with their respective authorities and planning needs (40 CFR 1508.5 and 40 CFR 1501-6).

3. The Forest Responsible Official may ask an agency with expertise regarding specific issues pertinent to the analysis to be a cooperating agency at any time when it will facilitate the analysis (40 CFR 1508.5 and 40 CFR 1501.6).

C. Procedures Common to both Joint Planning and Cooperating Agency Status

1. The agencies will use the procedures outlined in Section IV. - PROJECT LEVEL PLANNING UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT, and other applicable federal laws, to initiate and conduct joint planning or cooperative planning.

2. Any request from either agency requesting joint planning or cooperating agency status shall be made in writing to the Forest Responsible Official or Chair of the City Commission as applicable. Each agency shall respond in writing in a timely manner to such a request given the scheduling needs of the requesting agency.

3. It is recommended that when the agencies are entering into a formal relationship (joint planning or cooperating agency status), a supplemental MOU should be executed which identifies the respective roles and responsibilities of each party as regards that specific project planning process.

SECTION VI. FOREST PLAN IMPLEMENTATION

A. The Region 6 Forest Plan Implementation Strategy (Steps of the Journey) is a Forest Service planning process that may occur between Forest Plan decisions and project level decisions. Its purpose is to identify a desired condition for a defined area on the Forest. This process does not involve NEPA decisions. The process serves as a source of proposals. It is not a prerequisite for either Forest-level planning (NFMA) or project-level planning (NEPA). "Steps of the Journey" is available at Siskiyou National Forest Service Offices and the Office of the Curry City Commission.

B. Participation by the public, State and local government, and Indian tribes helps in defining the area to be analyzed, compiling pertinent data for the existing conditions, developing the desired conditions for the area, and identifying possible management practices.

C. There are three basic "products" developed for each ecosystem management unit as a result of this process:

1. Description of historical conditions.
2. Description of existing conditions.
3. Description of desired conditions.
4. List of possible management practices.

D. The Forest will give notice to the City and provide the appropriate opportunities for full participation by the City in development of the four products of implementation planning listed above (Section VI.C.).

E. The City will participate as it determines appropriate. City participation in this process does not affect in any way City participation in either Forest-level planning (NFMA) or project-level planning (NEPA).

SECTION VII. FOREST LEVEL PLANNING UNDER THE NATIONAL FOREST MANAGEMENT ACT (NFMA)

A. The Forest is committed to implementing the requirements for coordination with the City according to 36 CFR 219.7 at the time that the revision for the Siskiyou National Forest Land Management Plan (hereinafter known as the "Plan") or significant amendments to the current Plan are initiated.

B. The Regional Forester is the Responsible Line Officer for revisions of or significant amendments to the Plan (36 CFR 219-10). However, all procedural requirements of 36 CFR 219 will be performed by the Forest Supervisor (36 CFR219.10).

C. According to 36 CFR 219.7(a-e) the Forest Supervisor shall:

1. (a) Mail notice of the preparation of the Plan to the Chair of the City Commission at the same time the Notice of Intent is published in the Federal Register, along with a general schedule of anticipated planning activities;

2. (b) Cooperate with the City to review the Curry County Land Use Plan to determine the City's planning objectives, to assess the interrelationship of the Forest Plan and the Curry County Plan, and other pertinent Federal, Sate and local land use plans, and to consider means for resolving any conflicts identified. The Results of this review will be displayed in the EIS;

3. (c) In addition to the Forest Plan scoping for the Environmental Impact Statement (EIS), at a minimum meet with the City three (3) times: 1) at the beginning of the forest planning process to develop procedures for coordination; 2) to validate issues which the City has identified; and 3) prior to recommending the preferred alternative in the draft EIS;

4. (d) Seek input from the City to help resolve issues and identify areas where additional research is needed;

5. (e) Cooperate with the City to conduct appropriate monitoring and evaluation of Forest activities undertaken in implementing the Plan. This monitoring shall include evaluation of the effects on land, resources, and communities adjacent to or near the Forest and nearby lands under City jurisdiction.

D. In addition to 36 CFR 219.7:

1. The City and Forest may solicit public input for the Plan either individually or jointly using methods including, but not limited to, holding public hearings or meetings, public service announcements, open houses, etc.

2. The City shall coordinate with the Forest, utilizing any available resources, including universities, to develop meaningful and useful social, economic and cultural data and information which the Forest will consider in evaluating the impact that Plan revision and significant amendments thereto would have on those resources.

3. The Forest shall monitor its Plan implementation to predict possible social, economic and cultural impacts which may occur as a result of its decisions or pending decisions and inform the City in as timely a manner as possible.

4. Based on the results of monitoring, the City may request that the Plan be revised or significantly amended. The Forest Supervisor has authority to determine if the Plan will be significantly amended or revised (36 CFR 219.10(f).

SECTION VIII. FOREST INVOLVEMENT IN CITY PLANNING

A. It is recognized that the Forest administers 48 percent of the land base of the City, and that Forest employees are members of the community and contribute greatly to the economic stability of the City. As such, the Forest and the City are interdependent both economically and socially. Therefore, both agencies desire that the Forest participate, to the extent appropriate, in City planning processes.

B. The City will give timely written notice of proposed ordinances, policies and procedures to be considered by the City which may be of interest to the Forest. At a minimum, the City will mail or fax the agenda of any City meetings to the appropriate Responsible Official(s). The City shall also provide earlier notice, either by telephone or in writing, of any such activities for Forest notification and for possible Forest involvement.

C. At the request of the City or its advisory committee(s), the Forest will provide information and participate in the City's planning process to the fullest extent practicable.

D. The City will provide to each District Ranger and the Forest Supervisor, copies of any City ordinances, policies or procedures or activities that might be pertinent to the Forest at the time they are approved by the Commission.

SECTION IX. MISCELLANEOUS

A. If either agency learns of proposals which may have an impact on the other, it shall inform the other in a timely manner.

B. In the case of an action with a short deadline for decision making for which these procedures cannot be followed, one party will contact the other promptly.

C. The Forest and the City shall meet in October and March of each year to exchange information, including as appropriate, projected annual receipts that the City will receive from the Forest Service, budget overviews, noxious weed control, new management practices, Forest Service employment trends, and upcoming projects that either the City or the Forest are contemplating that may be of interest to both parties. Additional meetings may be scheduled as necessary.

D. For improvement or maintenance of transportation facilities in Curry County, the Forest and the City shall cooperate in accordance with the Curry County Transportation System Maintenance Plan, attached to this MOU as Exhibit A and by this reference made a part hereof.

SECTION X. CONFLICT RESOLUTION

In the event of disagreement over the implementation or interpretation of this MOU, either agency may request a meeting between the District Rangers within the City and City officials to attempt to resolve the dispute. Both agencies shall have the opportunity to present their concerns and will strive to reach a consensus.

SECTION XI. GENERAL PROVISIONS

A. This agreement is subject to being terminated by either party upon sixty (60) days written notification of such intent. This notification must be made by registered mail, return receipt requested, to the Forest Supervisor or the Chair of the City Commission as appropriate.

B. Each agency will provide a list of points of contact for their organization within 15 days of execution of this MOU and within 15 days of a change in points of contact.

C. No member or Delegate to Congress or local official shall be admitted to any share or part of this MOU, or any benefit that may arise therefrom; but this provision shall not be construed to extend to the MOU if made for a corporation or its general benefit.

D. Supplements or amendments to this MOU may be proposed by either party and shall become effective upon approval by both parties.

E. In implementing this MOU, there shall be no discrimination against any person because of race, religion, color, sex or national origin.

F. Nothing in this MOU shall be construed as obligating the parties in the expenditures of funds or for the future payment of money in excess of appropriation authorized by law.

IN WITNESS WHEREOF, the parties hereto have executed this Memorandum as of the date below.

Forest Supervisor Date Chairman Date
Siskiyou National Forest Curry County Commission

A system of good, parallel, alternative routes to US 101 would address the impacts realized when the highway it closed. Developing this system comes at a cost. Some of the roads identified as possible alternatives to the highway require substantial capital improvements such as widening and paving to make them viable, safe alternatives. Others may require only a higher level of maintenance such as grading and snow removal, but this too comes at a cost. The following paragraphs describe the improvements needed on the roads which were identified as possible alternatives.

Elk River Road and Euchre Creek Road – Elk River Road, in combination with Euchre Creek Road and Forest Service Road 5502 provide an alternative route to US 101, bypassing Humbug Mountain State Park and Arizona Beach. Approximately 18 miles of this route (6 miles on Road 5502 and 12 miles on Euchre Creek Road) are maintained at Forest Service Maintenance Level 3. Roads in this maintenance level are typically low speed, single lane with turnouts and spot surfacing. User comfort and convenience are not considered priorities. Traffic management strategies are either "encourage" or "accept." "Discourage" or "prohibit" strategies may be employed for certain classes of vehicles or users. To make this route a viable alternative to US 101 during emergencies, it is recommended that these roads be maintained at Maintenance Level 4. At Level 4, most roads are double lane and aggregate surfaced. Some roads may be paved and/or dust abated. The most appropriate traffic management strategy is "encourage."

Changing a Forest Service Road's Maintenance Level requires road reconstruction. Road reconstruction consists of the investment in construction activities that result in the betterment (raised traffic service level, safety, or operating efficiency), restoration (rebuilding a road to its approved traffic service level), or in the realignment (new location of an existing road or portions thereof) of a road. The process begins with the reviewing of the

Road Management Objectives which define the intended purpose of an individual road based on design, operation and maintenance criteria.

It was estimated that a one-time capital cost of $100,000 per mile would be required to bring these roads from Maintenance Level 3 to Level 4. To improve 18 miles of Euchre Creek Road and Road 5502 would cost $1.8 million. After that, annual maintenance costs would increase as well. Average annual maintenance costs in western Curry County are $400 per mile for Level 3 roads and $1,000 per mile for Level 4 roads. The difference between these two, $600 per mile, represents the increase in maintenance costs that would be realized each year. The average annual cost to maintain an additional 18 miles of Forest Service roads at the higher maintenance level would be $10,800.

Meyers Creek Road – Meyers Creek Road was identified as a viable, parallel alternative route to US 101, although it does not bypass a known slide area on the highway. Nonetheless, this road does not need improvements to be used as an alternative to the highway and could be used as a detour during minor construction on the parallel three-mile section of US 101.

Pistol River Loop Road – Pistol River Loop Road was also identified as a viable, parallel alternative route to US 101, although it does not bypass a known slide area on the highway. Nonetheless, this road does not need improvements to be used as an alternative to the highway and could be used as a detour during minor construction on the parallel four-mile section of US 101.

Carpenterville Road – According to the local community, mud and rockslides at Hooskanaden close US 101 for two to three weeks approximately every 15 to 20 years. The last time a slide occurred here, Carpenterville Road remained open as a way to bypass the slide area for passenger car traffic; however, trucks were prohibited from using the road. Normally trucks are not prohibited from using Carpenterville Road, but because US 101 provides a much faster and safer route for trucks, through trucks do not use the road. When US 101 is open, only the occasional logging truck accessing adjacent forest land uses Carpenterville Road. The pavement width is only about 20 feet, and the road has some very tight, narrow curves. The substandard

road conditions do not pose a problem under normal conditions, when the road only serves local land access; however, a significant safety problem arises when the road is used as a detour for US 101. With the additional passenger car traffic during the highway closure, the road was deemed unsafe for truck traffic, and trucks were prohibited from using the road.

The truck restriction on Carpenterville Road caused an undue economic hardship on the City of Brookings. A local lumber company was under contract to deliver wood products to a ship in Coos Bay. On US 101, the trip between Brookings and Coos Bay is approximately 100 miles. When US 101 was closed by the Hooskanaden slide, and trucks were prohibited from Carpenterville Road, the only alternative for the lumber trucks was to divert south on US 101 to California, travel north back into Oregon on US 199 to Grants Pass, travel north on I-5 to Roseburg, and travel west on OR 42 to reach US 101 south of Coos Bay, a 250-mile detour.

During the public involvement process, community members identified the need to keep Carpenterville Road open to truck traffic when US 101 is closed. The cost to improve the road to a level where it could safely be used by two-way traffic is quite high. It was assumed that the road would have to be widened from its current 20-foot width to 32 feet, to accommodate two 12-foot travel lanes and four-foot paved shoulders. The cost to make this improvement was estimated at $500,000 per mile for the eight miles at the south end and the eight miles at the north end, and at $1 million per mile for the middle eight miles, resulting in a total project cost of $16 million. This cost would be borne by the State (ODOT).

An option to a major widening project would be to keep the road in it's existing condition, and simply restrict truck use to certain hours of the day during an emergency. For example, the road use could be dedicated to northbound trucks for one hour in the morning and one hour in the evening, followed by one hour dedicated to southbound trucks in the morning and one hour in the evening. During the other 20 hours of the day the road would remain open for two-way passenger car traffic. This option would have no capital costs; the only costs incurred would be those resulting from vehicular enforcement at the north and south ends of the road.

Recommendation: It is recommended that Elk River Road, along with Euchre Creek Road and Forest Service Road 5502 be developed as a parallel, alternative route to US 101 for emergencies. This can be accomplished by raising the maintenance level from Level 3 to Level 4. The cost for this project is estimated at $1.8 million, with annually occurring maintenance costs of $10,800. This was identified by the community as a high priority project.

Deferred maintenance, which is maintenance activities that can be delayed without critical loss of facility serviceability until such time as the work can economically or efficiently performed, also needs to recognized. Deferred maintenance costs for Level 3 roads are $5,400 per mile and Level 4 roads are $35,300 per mile. Deferred maintenance work items could include seal coats, surface replacement, bridge painting, and culvert replacement.

All of the per mile rates are average rates for typical roads. The Euchre Creek Road is not a typical road, as it normally experiences damage during the winter months ranging from slides onto the roadway to slumping roadway and total road failures. The Forest Service could easily plan to spend, on average, an additional $25,000 per year. Some years such as 1996 and 1998, repair costs (not maintenance) will exceed $300,000.

There are two private landowners, South Coast Lumber Company and John Hancock Company, who are cooperators with the Forest Service in maintaining most of Euchre Creek Road. They would need to be in agreement with any changes to that road.

Something that has not been factored in is traffic volume. Forest Service Roads are not designed nor constructed for heavy traffic volume. The highest maintenance level road is a Level 5. It is a double lane, paved road with average daily traffic for the past six year of only 225 vehicles. A sudden increase in heavy

commercial use occurred when US 101 went out at the Arizona slide. The pavement and aggregate rapidly began to deteriorate. The maintenance cost are for a typical forest service roads that have been designed and constructed for low traffic volumes and reduced speeds. The average daily traffic volumes to occur emergency use have not been estimated at this time.

It is recommended that Carpenterville Road be kept in its existing condition, rather than pursue an expensive widening project (estimated to cost $16 million). During emergency situations, where sections of US 101 which can be bypassed by Carpenterville Road are closed, trucks should not be unconditionally prohibited from using the road. Instead, trucks should be restricted to certain hours of the day during an emergency. This recommendation would have no capital costs; the only costs incurred would be those resulting from vehicular enforcement at the north and south ends of the road.

Meyers Creek Road, Pistol River Loop Road, Ophir Road, North Bank Rogue River Road and Edson Creek Road, and North Bank Rogue River Road and Squaw Valley Road can all be used as alternates to US 101 without any physical improvements. These roads are all identified as such in this Plan.

Option 3. Improve the intersection of Benham Lane and Ocean View Drive in Harbor

Overview: Ocean View Drive intersects Benham Lane at a "T" intersection controlled by a STOP sign. Intersection sight distance on Ocean View Drive is extremely poor to the left (to the west). This is due to the skewed angle at which the two roads intersect and the grades on both roads. Ocean View Drive slopes down to the north at a grade, which is over five percent where it intersects Benham Lane. The grade on Benham Lane is smaller, and this road slopes down from the east to the west (from US 101 to the ocean). A two-foot high concrete wall on the southwest corner contributes to the poor sight distance.

Two improvement options were evaluated for this intersection. The first is a low cost option that improves sight distance without realigning the roadways. The second improves sight distance by realigning Ocean View Drive. These short-term improvements are considered with the understanding that this intersection will be included in any larger study conducted in conjunction with alternatives for the US 101/Benham Lane intersection.

Option 1: The first option consists of removing the two-foot high concrete wall which lies along the west side of Ocean View Drive. This concrete wall contributes to the poor sight distance for vehicles on the Ocean View Drive approach. The wall supports a chain link fence that was installed for pedestrian safety. It prevents pedestrians on Ocean View Drive from falling down the embankment to Benham Lane. The chain link fence should be reinstalled, at ground level, once the concrete wall is removed. The chain link fence would not result in the same visual barrier as the concrete wall and will make traffic on Benham Lane more visible to drivers stopped on Ocean View Drive, and vise versa. In addition, a convex mirror should be installed on Benham Lane, directly across from, and facing, Ocean View Drive. This is a typical treatment used on blind corners. The cost for these improvements would be approximately $10,000.

The advantage of this improvement is that it improves sight distance without costly road reconstruction. The disadvantage of this improvement is that it does not improve the horizontal and vertical curves on the two roads, the primary reason for the poor sight distance.

Option 2: The second option consists of realigning the northbound approach lane on Ocean View Drive to the east such that it effectively becomes a channelized right turn lane eventually paralleling Benham Lane before merging with it, much like an acceleration lane. The cost of this improvement would be approximately $50,000.

The advantage of this improvement is that it makes vehicles on Ocean View Drive more visible to drivers traveling east on Benham Lane. The disadvantages of this improvement are that it does not significantly

improve sight distance to the west for drivers on Ocean View Drive, it would displace the sidewalk and bike lane on the south side of Benham Lane, and it involves costly road reconstruction.

Recommendation: Option 1 is recommended for this intersection, primarily based on the lower cost, and because it improves sight distance for both traffic on Benham Lane and Ocean View Drive and because the improvements all lie off-road, it would not disrupt traffic during construction or permanently disrupt the sidewalks and bike lane on Benham Lane.

This intersection will be included any study that investigates impacts to the US 101/Benham Lane intersection.

Option 4. Improve the intersection of Lower Harbor Road and Shopping Center Road at the entrance to the Port of Brookings

Overview: Lower Harbor Road and Shopping Center Road are classified as collectors by Curry County and City of Brookings, respectively. Lower Harbor Road connects the Port of Brookings/Harbor with US 101. Shopping Center Road lies parallel to US 101 between Lower Harbor Road and Hoffeldt Lane. The two roads intersect at a "T" intersection, with the entrance to the port located directly across from Shopping Center Road. The intersection is two-way STOP controlled, with Lower Harbor Road being the through street.

At various times, community concern was raised in favor of changing the existing two-way STOP control to signalized control. ODOT Region 3 analyzed this intersection to determine whether the intersection met the warrants for signalization; it did not. The intersection also did not meet the warrants for all-way STOP control.

The cost to install a traffic signal at a typical intersection is over $100,000. Traffic control signals should not be installed unless one or more of the signal warrants in the *Manual on Uniform Traffic Control Devices* is met. Warrants for traffic signals are based on minimum traffic and pedestrian volumes, hours of delay, need for gaps in continuos traffic and accident history. In addition to meeting one or more warrants for a signal, installation of a traffic signal must improve the overall safety and/or operation of the intersection. When a traffic signal is not warranted, STOP sign control is an appropriate traffic control measure. As stated above, this intersection did not meet the warrants for a traffic control signal.

All-way STOP control is ordinarily used only where the volume of traffic on the intersecting roads is approximately equal. All-way STOP control is warranted where traffic signals are warranted and the all-way STOP is an interim measure that can be installed quickly to control traffic while arrangements are being made for the signal installation, and where accident history and traffic volume warrants are met. As stated above, this intersection did not meet the warrants for all-way STOP control.

Recommendation: It is recommended that the existing two-way stop control be maintained at the intersection of Lower Harbor Road and Shopping Center Road. The traffic volumes and accident history do not warrant the high cost of installing a traffic signal or even changing the control to an all-way STOP.

Option 5. Implement Transportation Demand Management Strategies

Overview: Transportation demand management (TDM) strategies change the demand on the transportation system by providing facilities for modes of transportation other than single occupant passenger vehicles, such as implementing carpooling programs, altering work shift schedules, and applying other demand management measures within the community. The Transportation Planning Rule (TPR) recommends that cities should evaluate TDM measures as part of their Transportation System Plans. TDM strategies may be most effective in large, urban cities, but some strategies can still be useful in the rural and urban areas of Curry County.

Two types of TDM measures that could be useful in Curry County would be providing facilities for alternative modes of transportation and implementing a countywide carpooling program. The first measure could be implemented by requiring all future street improvement projects to include the addition of some sort of pedestrian facility, such as new sidewalks or walkways, that will effectively separate pedestrians from motorized traffic. All new street improvement projects should consider bicycle facilities as well. For the second measure, Curry County could organize a carpool program for residents who live in one of the three cities or in rural areas but who work in another area.

Impacts: Although the primary goal of these measures is to reduce the number of vehicle trips made within the county, especially during peak periods, street capacity for automobiles and trucks is generally not an issue in Curry County. However, providing adequate facilities for pedestrians and bicyclists improves traffic and pedestrian safety. A greater emphasis on walking or biking, and reduced reliance on single-occupancy trips to work can improve air quality and noise levels as well.

Cost Estimate: Unit costs for typical TDM projects are as follows:

- Concrete Sidewalks – The estimated cost to install new sidewalks on one side of an existing street is approximately $30 per linear foot. This assumes a six-foot wide walkway is composed of 4 inches of concrete over 2 inches of aggregate.
- Multi-use Paths – A multi-use path 10 feet wide would cost approximately $16 per linear foot. This assumes the path is constructed of 2 inches of asphalt over 4 inches of aggregate.
- Paved Shoulders – Shoulders that are 4 feet wide constructed along both sides of a road would cost approximately $25 per linear foot. This is based on 4 inches of asphalt over 9 inches of aggregate.
- Bike Lanes – The cost to install bike lanes on both sides of an existing road is approximately $45 per linear foot. This cost includes widening the roadway by 5 feet on both sides, installing curbs, 4 inches of asphalt over 9 inches of aggregate, and placement of an 8-inch painted stripe.
- Striping – The cost to strip a typical crosswalk is $3 per linear foot; the cost to paint an 8-inch stripe for a bike lane is approximately $0.70 per linear foot.

Rideshare program – A rideshare program could be operated for a cost of approximately $20,000 per year. For comparison purposes, a rideshare program located in Central Oregon, covering a larger geographic area and serving a larger population, has an annual operating budget of approximately $50,000. ODOT participates in this program by providing approximately 60 percent of the funding.

Recommendation: Curry County can implement TDM strategies by requiring all future street improvement projects to include the addition of some sort of pedestrian facility, such as new sidewalks or walkways, which will effectively separate pedestrians from motorized traffic. Connecting sidewalks that are not currently connected on some streets can increase the effectiveness of the pedestrian facilities. All new street improvement projects should consider bicycle lanes as well.

Implementing a local carpool program in Curry County is a possibility. Residents who live in Curry County and residents who live in other cities and rural areas within the county should be encouraged to carpool with a fellow coworker or someone who works in the same area. Carpooling can take advantage of excess parking at larger retail areas, or parking unused during the week, such as at churches. Costs are typically limited to those needed for a part-time to full-time program administrator to provide public education, advertising, and coordinate park and ride lots and signs.

Summary

Table 6-1 summarizes the recommendations of the improvement options analysis based on the evaluation process described in this chapter. Chapter 7 discusses how these improvement options fit into the modal plans for Curry County.

TABLE 6-1
TRANSPORTATION IMPROVEMENT OPTIONS: RECOMMENDATION SUMMARY

Option	Recommendation
Improve East-West connection to I-5	Do not implement; maintain existing road
Develop Alternative Route to US 101	Implement
Improve intersection of Benham Lane and Ocean View Drive	Implement
Improve the intersection of Lower Harbor Road and Shopping Center Road	Do not implement; maintain existing configuration
Implement Transportation Demand Strategies	Implement