T R A N S P O R T A T I O N

M A S T E R P L A N

City of Lincoln City

January 1995

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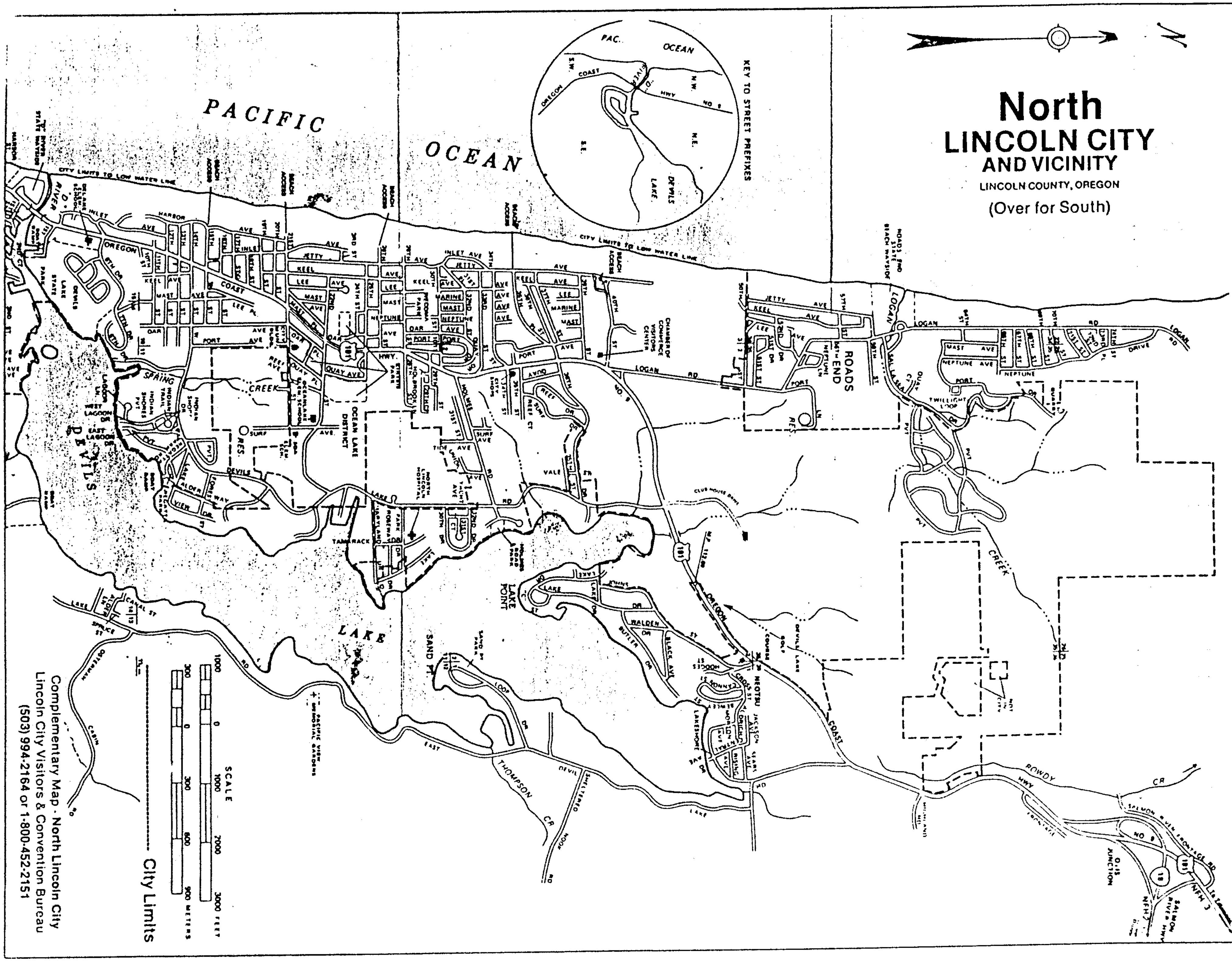
FINAL DRAFT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(Over for South)
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ROADS END
LAKE POINT
SAND PT.
CITY LIMITS TO LOW WATER LINE
SCALE
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City Limits
Complementary Map · North Lincoln City
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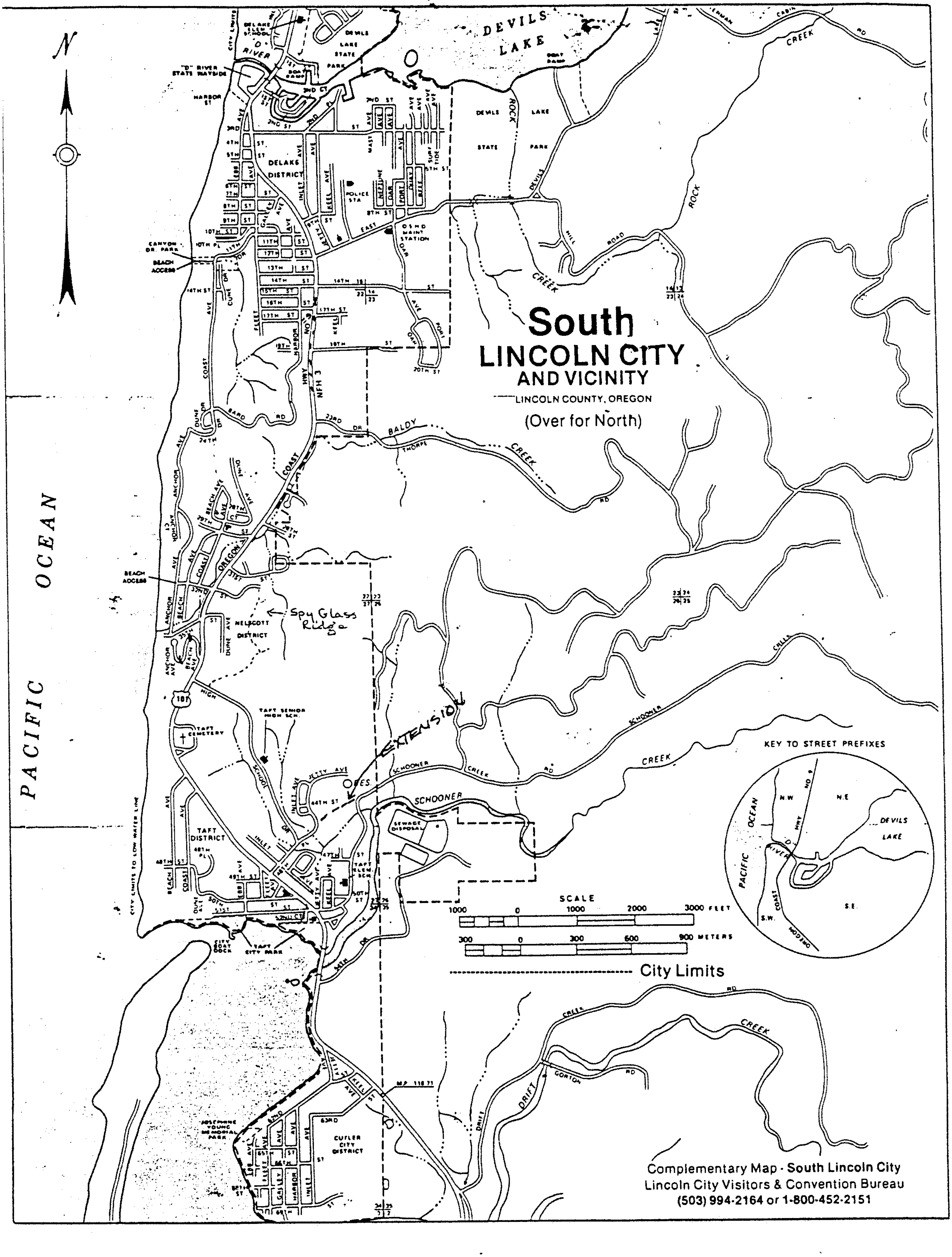
South
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DEVILS LAKE
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EXECUTIVE SUMMARY

In compliance with the Oregon Department of Transportation's (ODOT's) requirements, the City of Lincoln City commissioned a consulting firm to study and develop a comprehensive Transportation Master Plan for the city. The Plan is "multi-modal"--that is, it addresses roadway, bicycle, pedestrian and transit modes--and it includes a financial plan to implement these improvements over the next 20 years.

A Transportation Advisory Committee (TAC) was formed to provide input during the development of the Plan. The committee consisted of city staff, representatives from the City Planning Commission, Traffic Safety Committee, Chamber of Commerce, Economic Development Committee, Lincoln County, ODOT, and local residents. Continued coordination between these entities is recommended as an on-going effort to follow the implementation of the Plan, and to study and assist in future transportation improvements.

Currently, there is significant traffic in Lincoln City with increasing congestion on Hwy 101 and an increasing demand for off-street parking. During an incrementally extended tourist season, we find significantly dimished Levels of Service (LOS) because of insufficient and/or poorly-utilized roadway (Hwy 101) at critical points. In addition, much of the local street system is substandard, with narrow lanes, inadequate shoulders, lacking sidewalks and standard bike lanes.

It should be noted here that reliable information on the Siletz Indian Gambling Casino and Convention Center in the north end of the city--an unanticipated event projected for 1995-96--is not available. Therefore no data on that project have been factored into this revised Transportation Master Plan. Further revisions to the Plan are anticipated when meaningful data become available.

The over-burdened 7.3 mile length of Hwy 101 as it passes through Lincoln City fluctuates in width from 2 traffic lanes to 5 to 4 to 3 and back to 2 lanes again. These improper and ill-timed permutations are difficult to navigate and dangerous to the unfamiliar driver. The initial portion of this study focused on the assessment of those improvement projects which will give the quickest relief to the obstacles, improve traffic flow, and increase safety.

Some of the short-term improvements identified include:

1) removal of on-street parking in certain areas (with commensurate off-street parking provision)
2) pavement-marking improvements (restriping to 4-lanes with left-turn lanes where possible)
3) modifications to the signal system on Hwy 101
4) traffic signing improvements

Lincoln City is expected to double in both seasonal and permanent population over the next 20 years (24,200 and 10,700 respectively). Although these projections are probably conservative, they should alert us to the fact that even without a Casino/Convention center,

Lincoln City is slated for an exceptional rate of growth--a community whose present population is only 6,200 and whose infrastructure has not kept pace with needs.

To meet the growing traffic demands associated with just the normal increases and the projected (normal) increase in through and peak-traffic, significant timely system improvements must occur in the Hwy 101 corridor. Traffic projections indicate that, even if widened to four travel lanes all the way through town--with left turn lanes where possible--Hwy 101 would again be at capacity early in the new century. *An alternate roadway, that carries the growing volumes of through-traffic around town, must be on-line to meet the need.*

This Plan builds toward the future--with the Hwy 101 Scenic Byway Corridor passing to the east, and the through-town roadway reclassified as a **primary city thoroughfare**: Lincoln City's "Main Street".

In the late 1960s an alignment for an eastside bypass through the Rock Creek Corridor was identified by ODOT. The public hearings process was accomplished and, by the early '70s, engineering work had progressed nearly to the construction stage when a group of locally influential businessmen, fearing loss of tourism, blocked the project. In the ensuing years, the community has continued to call for the bypass, and today the negative impacts (of an overloaded roadway) to the economy have made advocates of virtually all sectors. In addition, support for the L.C. bypass from outside the community--County Commission, towns to the south, tourists, truckers and haulers, etc.--has been noteworthy. In 1984, a bypass was incorporated into the Lincoln City Comprehensive Plan.

Analysis of an aggressive Transportation Demand Management program (TDM) showed that shifting travel away from single occupant vehicles during peak hours of travel would not reduce the need for additional roadway capacity in the near term.

The study also included an analysis of the demand for a fixed-route bus service in Lincoln City. Because of the linear layout of the city along Hwy 101, it would appear that there is an opportunity to serve a significant sector of the population and visitors in the city through bus service primarily operating along that city arterial. Lincoln City also has a fairly high percentage of elderly residents who would benefit from improved bus service. Two options for the implementation of a fixed-route bus service were evaluated. The recommended option was the implementation of a limited fixed-route bus service during the summer, with a supplementary (improved) Dial-A-Ride service.

This Transportation Master Plan includes a functional classification plan for roadways (arterials, major and minor collectors, and local streets) that is similar to the state's, but which primarily conforms to the *Subdivision Ordinance for Lincoln City [OR 78-32].* The hierarchy of street classification could just as well have been "arterials", "collectors", "sub-collectors", and "access" streets as referred to in the design resource: *"Residential Streets"*--first and second editions--a joint effort of the American Society of Civil Engineers, the National Association of Home

Builders, and the Urban Land Institute, ULI. (See Appendix E.) The *American Public Works Association* (APWA) *Standards*, including the *Supplemental Standards of Lincoln City* is a recognized specification resource which will guide reconstruction of existing streets and new street construction.

Under the Lincoln City Master Plan, bicycle lanes would be relocated to selected arterials (other than Hwy 101) and major collectors. The pedestrian facilities plan herein includes priorities for sidewalk development in Lincoln City.

Through the Oceanlake and Taft commercial districts, the use of intrusive traffic management strategies would be minimal. After the coordinated removal of on-street parking, a fifth-lane would be striped on the pavement to designate left turns, mostly at signalized intersections. To facilitate the flow of traffic on Hwy 101, several selected cross streets would become right-on/right-off. In the Delake, Nelscott and Taft areas, in the absence of traffic signals, left-turn opportunities would be striped on the pavement.

In local neighborhoods, the need for strategies--other than providing adequate roadway--to solve real and potential traffic problems is minimal. A process is described where citizens can identify poor traffic function, petition the city to address the problem and utilize a test installation which, if helpful, might result in neighborhood and City Council approval.

Most of the arterial improvements in this plan are classified as "Modernization" (adding new lanes or shoulders) and "Operations" (relating to safety and traffic operations). They have been prioritized into those improvements which should occur within 1-5 years, and those which should occur within 5-20 years. Potential funding sources include Lincoln County, Lincoln City, the state, local improvement districts (LIDs), and systems development charges (SDCs).

INTRODUCTION

The new Oregon State Transportation Planning Rule mandates that communities over 2,500 prepare individual transportation master plans. These community efforts parallel and slighly precede the formation of Oregon's Transportation Plan (OTP). The stated purpose of the OTP is to "develop a safe, convenient and efficient transportation system which promotes economic prosperity and livability for all Oregonians".

That is a worthy goal to which the Lincoln City Master Plan subscribes. This Plan summarizes the results of a comprehensive study of transportation conditions and improvement needs in Lincoln City, Oregon, leading to the development of a Master Plan for the city with a planning horizon which stretches to the year 2015. The objective of this Plan is the claiming of Hwy 101 as the city's primary arterial--"Main Street".

Discussion of specific short-term transportation improvements point to a locally-implementable 5-year program. The overall plan has been developed as a dynamic multi-modal plan. It addresses improvements to the street system, as well as additional off-street parking, improvements to transit service and pedestrian and bicycle facilities. The plan also refers to transportation improvement priorities over the next 20 years. With certain notable exceptions, the Tranportation Master Plan will be incorporated as an element in the Lincoln City Comprehensive Plan.

Although the main impetus for the Transportation Master Plan was the requirement of the state's Transportation Planning Rule, it is worth noting that Lincoln City has not had a comprehensive transportation plan since the Cutler City-Taft-Nelscott-Delake-Oceanlake communities combined to form the City of Lincoln City in 1965.

This document is divided into ten chapters:

Chapter 1 describes the plan's **Goals and Objectives**, the planning process, the relationship of other planning efforts, and provisions.

Chapter 2 describes **Current Conditions** of the city transportation system, addressing street physical and operating conditions, pedestrian and bicycle facilities and transit service.

Chapter 3 identifies **Short-term Transportation Improvements**, which should be programmed as soon as possible to alleviate existing problems identified in Chapter 2.

Chapter 4 discusses the process of developing year 2015 **Traffic Projections** for the city street system, using a traffic forecasting model especially developed for this planning effort, and updated population and employment for both summer and winter conditions.

Chapter 5 summarizes the evaluation of certain **Roadway System Alternatives**, focusing on the improvement of Hwy 101 as Lincoln City's "Main Street".

Chapter 6 & 7 present the results of specific analyses of **Street Lighting**, and **Public Transit** in Lincoln City.

Chapter 8 presents the multi-modal **Transportation Plan**, including maps showing various transportation system facilities, road design standards, traffic management, and road improvement priorities.

Chapter 9 amplifies the **Lincoln City Transportation Master Plan**, highlighting specific facility improvements and policies.

Chapter 10 presents the components of a **Monitoring Program** to collect and evaluate data, to review and approve future site developmemt proposals and further studies which need to be conducted. This program would assure that the Transportation Master Plan is being implemented and that the improvements meet the Goals and Objectives of the plan.

Chapter 11 prioritizes and describes the **Implementation Program**, including construction cost estimates and potential funding participants.

A short discourse on **monitoring** the impacts of the implementation of the transportation plan follows the final chapter.

A discussion of air, water, rail, and pipeline transportation, and of historical and potential funding sources for improvements to the transportation system in Lincoln City, as well as the calculation of a systems development charge (SDC), are presented in a separate report to this document.

<<<<<<<<<<<<<<<<<<<<<<<< C H A P T E R 1 >>>>>>>>>>>>>>>>>>>>>>>>

GOALS AND OBJECTIVES AND THE PLANNING PROCESS

The purpose of this Transportation Master Plan is to provide a dynamic guide for implementing the goals and objectives identified herein relative to improved transportation facilities and services in Lincoln City into the 21st century.

Goals and objectives for this transportation plan were initiated through a review of goals and policies in the city Comprehensive Plan, previous transportation studies, community Town Hall meetings, and the input of the Transportation Advisory Committee which was established to guide the preparation of the plan.

In reviewing past plans it was noted that the need for a by-pass was cited in all of the following: The Lincoln City Transportation Safety Study (Stramm Engineers, 1981); the Lincoln City Comprehensive Plan (1984); the Year 2000 Development Plan (L.C. Urban Renewal Authority, 1988); the Lincoln City Origin and Destination Study (ODOT System Studies Unit, 1990)

In addition, environmental studies have shown that the coastal highway system is extremely vulnerable to Cascadian subduction zone earthquake and tsunami events which would isolate beach communities, leaving them with no alternate route of escape. Alternate surface transportation systems are crucial to post-earthquake rescue and salvation activities.

LINCOLN CITY COMPREHENSIVE PLAN

The discussion on transportation system development in the current 1984 Lincoln City Comprehensive Plan presents a single goal and nine associated policies:

Transportation Goal

To provide a safe, convenient and rapid transportation network to facilitate the movement of goods and people.

Transportation Policies

1. The City shall consider the impact of proposed development on the proposed routes outlined in the City Street Inventory where development is proposed.

2. The City shall require that Highway 101 related alternatives shown in the Traffic Safety Program be evaluated by the Oregon Department of Transportation in their design review for Highway 101 improvement projects within Lincoln City.

3. The City's number one priority shall be to acquire professional

design and engineering assistance to evaluate inventory and other alternatives for improving citywide transportation.

4. The City shall consider utilization of a mass transit system and shall explore various forms of funding.

5. The City shall continue efforts to support and establish a route for through traffic other than Highway 101, such as a Lincoln City Bypass.

6. The City shall develop a system of frontage roads and parking lots accessible to Highway 101 linked to a pedestrian system for commercial and service access and limited vehicular traffic.

7. The City shall work with residents to form local improvement districts to improve roads within the City.

8. The City shall work with a committee of citizens to formulate parking improvement plans for congested areas.

9. The City shall continue to acquire state and federal funds for transportation improvements.

These goals and policies are currently applicable in the development of the Lincoln City Transportation Master Plan.

REFINED TRANSPORTATION PLAN GOALS AND OBJECTIVES

Specific goals and objectives, developed to guide the development process for this Master Plan, are found in Table 1 at the end of this chapter. They are generally consistent with the overall value statments identified in the 1984 Comprehensive Plan.

THE PLANNING PROCESS

The Transportation Advisory Committee consisted of representatives from the following interests:

* Lincoln City Public Works Department
* Lincoln City Planning Department
* Lincoln City Police Department
* Lincoln City City Council
* Lincoln City Planning Commission
* Lincoln City Traffic Safety Committee
* Lincoln City Chamber of Commerce
* Lincoln County Planning Department
* Oregon Department of Transportation - Region 2
* Oregon Department of Transportation - Hwy 101 Corridor Study Project Manager
* Individual Citizens

Four Advisory Committee/Town Hall meetings were held during the early

phase of the planning process. The intent was to identify issues and alternatives for further study which will have community support. In addition, interim work products and the draft of the Transportation Plan were reviewed.

THE PLANNING AREA

The planning area for the study included all of the land within the current Lincoln City urban growth boundary and within the City limits: Oceanlake, Delake, Nelscott, Taft, and Cutler City . The general boundaries of the total area include East Devils Lake Road on the east, Drift Creek Road on the south, the Pacific Ocean on the west, and the north city limits/Hwy 101 on the north. The Roads End area is not included in the planning area, but was considered in the development of the traffic forecasting model.

RELATIONSHIP TO OTHER PLANNING EFFORTS

Although Lincoln City's Transportation Master Plan focuses on the improvement of Hwy 101 as a *primary city thoroughfare* rather than as a state-maintained *U.S. highway* of moderate to high-speed, it acknowledges the state's need to move traffic safely and efficiently through our community. Implementation of this Master Plan would in no way impede or inhibit those requirements. In fact, it agrees in principle as well as in certain specific methods of achievement. The inclusion here of a portion of the Oregon Transportation Plan's "statewide integrated transportation planning and system management" statement is a formality; the balance of the OTP statement will be found in Appendix X. The OTP may or may not be useful in the preparation and implementation of Lincoln City's Master Plan.

The Oregon Transportation Plan

> "The Oregon Transportation Plan envisions a transportation system that moves people and goods in a way that provides for livability and economic prosperity for all Oregonians. The system provides Oregonians and visitors with access to goods, services, jobs and reacreation, while providing Oregon industry access to national and international resources and markets. To most effectively meet the state's needs, the transportation system takes advantage of the inherent efficiencies of each transportation mode and encourages interconnection between the modes." (1)

Other City Master Plans

The Lincoln City Transportation Master Plan is just one component of the Lincoln City Comprehensive Plan being updated. Similar master plan efforts are being conducted for the wastewater, stormwater, andwater systems in the City. The population and employment projections developed for the transportation plan are also being used for the other Master Plans.

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(1) The Oregon Tranportation Plan, ODOT, 1992, p. 23

Highway 101 Corridor Study

The Oregon Department of Transportation (ODOT) is currently conducting a study to develop an improvement strategy for the entire 360-mile Highway 101 corridor along the Oregon Coast, including the 7.3 mile section through Lincoln City. This improvement strategy may be referred to here as the "Federally-funded Scenic Byway" or the "State's Hwy 101 Corridor project".

Although the ultimate goal of Lincoln City's Master Plan is the decommissioning of Hwy 101 to city arterial status, this study acknowledges the state's need to make facility improvements and even informationally cites the state's present land use management strategies along Hwy 101.

It is hoped that the information generated in Lincoln City's Master Plan might contribute to the state's overall corridor evaluation for use in its Coast Highway Corridor Master Plan.

T A B L E 1

GOALS AND OBJECTIVES
LINCOLN CITY TRANSPORTATION MASTER PLAN

ROADWAY DEVELOPMENT

1. Identify an overall improvement strategy for Lincoln City's "Main Street" which will lead to better utilization of the roadway, reduced traffic congestion and conflicts, and enhanced local traffic circulation.

2. Identify, and develop bicycle routes through and around town that are safe, attractive, and user-friendly.

3. Identify suitable alternate north-south local "reliever" routes to Hwy 101.

4. Develop improved east-west street connections with neighborhood needs and the direction of commercial in mind.

5. Develop a functional classification plan for all streets in the City.

6. Identify short-term improvements at critical intersections and along street segments, to solve pressing current traffic safety and congestion problems. Consider temporary test trials.

PEDESTRIAN FACILITIES

1. Develop a plan for improved pedestrian crossings of 101, including signal treatments, with some crosswalk relocation and development.

2. Develop criteria for further sidewalk development along the streets in the City, incorporating federal guidelines for the handicapped.

3. Develop an off-street pedestrian trail system, perhaps integrated with a bike trail system, to supplement on-street provisions.

BICYCLE FACILITIES

1. Identify and develop a system of off-Hwy 101 bicycle routes through and around town that are safe, attractive and user-friendly. Sign the *Oregon Coast Bike Route*.

2. Modify and update the 1987 City Bicycle Master Plan to reflect the latest information on traffic volumes, travel patterns, and new development locations in the City.

3. Identify a strategy for the development of bicycle repair and storage facilities in convenient locations to encourage bicycle travel in the City.

4. Investigate the potential for hostel-type accomodations in conjunction with the *Oregon Coast Bike Route*.

STREET LIGHTING

1. Develop criteria for identifying those street segments which warrant new or improved lighting.

2. Identify a strategy for jurisdictional responsibility for street lighting operations and maintenance.

PUBLIC TRANSIT

1. Identify the feasibility of instituting public transit service in the City, addressing the needs of a varied market (general residents, elderly, handicapped, visitors, intercity travel, etc.)

2. Develop a basic framework for a transit system in the City (routes, service levels, ridership, and captial, operating, and maintenance costs).

3. Evaluate the appropriate role of the existing cab and senior citizens' bus service in handling future public transit needs.

TRAVEL DEMAND REDUCTION

1. Investigate strategies for reducing vehicle trip-making in the City other than public transit--for example: carpool/vanpool incentives and flex-time applications.

OFF-STREET PARKING DEVELOPMENT

1. Refine the public off-street parking development plan along Hwy 101 through the City.

2. Develop improved beach access parking facilities in the City.

3. Identify a strategy for gradual and timely replacement of on-street parking along Hwy 101 associated with future roadway improvements.

TRANSPORTATION FINANCING

1. Identify financial strategies and resources that will allow long-term financing of transportation improvements in the City.

2. Identify the appropriate roles of System Development Charges

(SDCs) and Local Improvement Districts (LIDs) in transportation improvement financing.

3. Develop a Capital Improvement Program for Transportation needs that can be implemented with available funding sources.

PUBLIC INVOLVEMENT

1. Develop a Transportation Master Plan that addresses general public issues and concerns related to transportation system development in the City.

2. Evaluate and adopt those strategies and policies which most closely reflect the community's views and needs, while accommodating the state's need to move traffic safely and efficiently through the community.

3. Appoint members to a Regional Task Force to study regional transportation issues: a) to identify problem areas, b) to evaluate mutually acceptable solutions, and c) to coordinate efforts to achieve them.

4. Monitor the impact and effectiveness of the Transportation Master Plan as it is implemented.

<<<<<<<<<<<<<<<<<<<< C H A P T E R 2 >>>>>>>>>>>>>>>>>>>>

CURRENT TRANSPORTATION CONDITIONS

The current condition of the transportation system in Lincoln City was identified through the collection of past traffic and accident data from the City, Lincoln County, and ODOT; information from a City spreadsheet on the physical condition of streets, and a windshield survey.

STREET FUNCTIONAL CLASSIFICATION/JURISDICTION

The unique layout of the street system in Lincoln City has been influenced by two major factors:

1) the physical constraints imposed by the the Pacific Ocean on the west and Devils Lake on the east side of town; and

2) the combination of the street systems of five separate communities when Lincoln City was incorporated 28 years ago.

Because of geographic and physical constraints, U.S. Hwy 101 is Lincoln City's only north/south thoroughfare. It is like a 7.5 mile-long spinal column, which supports the predominantly *commercial* community which abuts it. The intersecting east/west streets are the ribs along which the predominantly *residential/recreational* neighborhoods are assembled.

The longitudinal nature of the City's commercial development in the north/south direction on Hwy 101 has necessitated longer trips than would have been required had there been major latitudinal commercial (collector) streets. A gradual east/west direction for commercial growth towards the beach is probable, and should be anticipated and supported by transportation policy.

Functional Classification

Figure 1, found at the end of this chapter, identifies the current functional classification and jurisdiction of streets in Lincoln City. In summarizing this information, this map (and all others using the street system as the base) divides the City into two sections--north and south--with "a" designating north, and "b" desiginating south. The street classification shown is that developed by the Lincoln City Traffic Safety Committee, and is, to a large extent, consistent with the classification plan developed in the 1981 Lincoln City Transportation Safety Study. The plan identifies arterial and collector streets, as well as "through" streets.

There are presently three arterials in the planning area, all with a north/south orientation:

Highway 101
West Devils Lake Road/N.E. 14th Street
East Devils Lake Road

Highway 101 is the only thoroughfare which connects the five incorporated communities making up Lincoln City: Oceanlake, Delake, Nelscott, Taft and Cutler City. It is also the only roadway serving through-traffic to other north or south destinations. *West Devils Lake Road* serves the residential area on the west side of Devils Lake, and provides an alternate partial north/south route for local traffic (in the north area only). *East Devils Lake Road*, most of which is located outside the current city limits, serves the residences on the east side of Devils Lake. At its south end (opposite S.W. 12th Street), East Devils Lake Road carries a high volume of traffic accessing the new Factory Stores in Lincoln City, the Post Office, city offices and newly-planned multiple family housing units.

Current designated collector streets include the following:

- N.W. Logan Road
- N.W. 30th Street/N.E. Holmes Road
- N. 21st/22nd Streets
- N. 6th Drive
- S. 32nd Street
- S.E. High School DRive
- S.W. 50th Street
- S.W. 51st Street
- N.W. Harbor Avenue/N.W. Jetty Avenue
- S.W. Anchor Avenue
- Schooner Creek Road
- S.W. 62nd Street/S. 63rd Street

Jurisdiction

U.S. Highway 101 is presently under the jurisdiction of ODOT. This Master Plan calls for the reclassification of the roadway as a primary city thoroughfare. Lincoln County has jurisdiction over East Devils Lake Road, West Devils Lake Road, Schooner Creek Road, and Drift Creek Road. All other roads within the city limits are under the jurisdiction of the City of Lincoln City.

STREET INVENTORY

An inventory of the physical characteristics of all arterial and collector streets in Lincoln City was conducted and is summarized in Appendix B. The inventory includes the following data:

- Right-of-way width
- Pavement width
- Number of travel lanes
- Presence of on-street parking
- Presence of sidewalks
- Presence of bike routes
- Speed limit
- Condition of pavement
- Pavement markings

Most of the collector streets in the city have only a 40-50 foot right-of way width. Some streets (such as N.W. Jetty) have only a 30-foot right-of-way. Most of these collector streets have less than a

24-foot *pavement width*, with minimal-to-no shoulders. The only streets with greater than two travel lanes are portions of the major arterial (Highwy 101) and N.W. Logan Road (intersecting Hwy 101 in the north end).

Highway 101 varies from a two to a five lane facility through the city. It is a rural **two**-lane facility north of N.W. Logan Road and between S. 19th and S. 32nd Streets. It is a three-lane facility with a center left-turn lane from N.W. Logan Road to N. 26th Street, from S. 32nd Street to S.W. Beach Avenue, from S. 54th Drive to S. 64th Street and from the 2-lane Schooner Creek Bridge south to the south city limits. Through the rest of the city, Highway 101 is a **four** to **five** lane facility.

Designated on-street parking is primarily located on Hwy 101 through the Oceanlake district between N. 13th Street and N. 22nd Street, with off-Hwy 101 curb-side parking on some of the approach (collector) streets (Example: S.W. 51st Street in Taft). Along some of the other arterial and collector streets, parking is possible along the roadway shoulder.

The speed limit on Hwy 101 varies from 30 to 35 MPH through the city. The speed limit on the minor arterials--namely West Devils Lake Road and East Devils Lake Road--varies from 25 to 35 MPH. The speed limit on collector streets is 25 MPH.

Overall pavement condition were observed in a 1991 windshield survey. Ratings were then established by translating specific data on the extent of cracking, settlement, and potholing into a rating system. Lincoln City's pavement rates from "very poor" to "very good".

The type and appropriateness of centerline striping on the collector and arterial street system was also inventoried. Many of the collector streets do not have centerline striping; others have inappropriate striping (given the existing roadway geometrics and/or available sight distance), and other road sections have faded markings making them unreadable.

There are eleven (11) traffic signals in Lincoln City, all of them located along Hwy 101 (see Fig. 1). All of these signals are maintained by ODOT. The seven signals between S. 12th and N. 22nd Streets are interconnected, with an on-street master controller at the S. 14th Street intersection. Most of the signals are span wire installations, with NEMA controllers. Several signal installations have deteriorated signal poles and vehicle and pedestrian heads.

TRAFFIC VOLUMES

Traffic volumes on the major streets in Lincoln City were measured in March and during Memorial Day weekend in **1992.** The Memorial Day counts reflected the traffic associated with the new Oregon Coast Aquarium in Newport. These counts supplemented previous counts obtained by the City of Lincoln City Public Works Department on the local street system during 1990 and 1991.

Figure 2 shows the *Daily Traffic Volumes on the 1992 Memorial Day Weekend* on the Lincoln City street system. This traffic volume is reflective of summer traffic conditions. There is extensive traffic along Hwy 101, ranging from 34,500 vehicles per day across the "D" River bridge in central Lincoln City to about 20,000 vehicles per day on the north and south ends of town.

Other roads with significant traffic volumes are N.W. Logan Road just north of Hwy 101 (10,000 vehicles/day) and S.E. East Devils Lake Road just east of Hwy 101 (9,500 vehicles/day). Most of the traffic on these two roads is associated with local developments: the two shopping centers on N.W. Logan Road just north of Hwy 101, and the Factory Stores shopping mall on S.E. East Devils Lake Road. Traffic on West Devils Lake Road ranges between 1,800 and 3,000 vehicles per day. On East Devils Lake Road, on the east side of Devils Lake, the traffic volume is about 1,000 vehicles per day. On other collector streets in the city, the traffic volume is generally less then 1,000 vehicles per day.

Figure 3 shows the PM *Peak Hour Traffic Volumes* on the Lincoln City street system during the 1992 Memorial Day period. Peak hour traffic ranges from 8% to 12% of the daily traffic on different street segments.

Figure 4 shows the *Daily Traffic Volumes* on the city street system for a typical winter weekday condition. The traffic volume *on Hwy 101* drops to slightly over 10,000 to 12,000 vehicles per day (about a two-thirds decrease over summer volumes). Traffic volumes on the other arterial and the collector streets are less than during the summer, but they drop at a lower rate because permanent residents make up a higher percentage of winter trips *on the local street system*.

Vehicle classification count information is only available for Hwy 101. Based on 1991 traffic date obtained at the ODOT permanent count station south of Lincoln City (at Otter Rock, north of Newport), about 77% of the traffic volume on Hwy 101 is passenger cars, 14% recreational vehicles and single unit trucks, and 9% multi-unit trucks and buses.

LEVEL OF SERVICE

Highway and traffic engineers have established various standards for measuring the traffic capacity of roadways and intersections. Each standard is associated with the *level of service* (LOS) desired. In urban areas, the level of service on major streets *with* traffic signals is reflected in the level of service (the *"stand time"*) at these intersections. For other streets *without* signals, a *roadway segment* level of service is appropriate. In either case, there are six level of service categories: from *"A"* or *free flow* operation to *"F"* or *overcapacity/stop-and-go* operation. Appendix C (Tables 1 and 2) provides the definition of the different levels of service for signalized and unsignalized intersections.

The capacities of each of the major streets in Lincoln City was calculated in a generalized way (see Fig. 5) and compared with the PM peak hour traffic volumes to determine locations of capacity

deficiencies. This comparison revealed that traffic volumes are approaching capacity only in the Hwy 101 corridor. On all other arterials and collectors, the current traffic volume is less than 80 percent of the roadway capacity, which is reflective of LOS "C" or better.

The Level of Service (LOS) along Hwy 101 was assessed in greater detail by analyzing the LOS at certain *signalized* Hwy 101 intersections during the March 1992 Spring Break period when peak hour turning movements at these locations were obtained (see Table 2). This analysis revealed that the N.W. Logan Road and East Devils Lake Road (at its *south* end) intersections experienced a congested LOS "D" during this period, with a LOS "E" experienced during peak summer weekend hours.

While there are few signalized intersections along Hwy 101 operating at a poor level of service, there typically is a poor level of service for traffic movements *onto and off of* Hwy 101 at several *unsignalized* intersections during peak hours/peak summer conditions.

The Kittelson & Associates Analysis (October 1994-Table 1) cites LOS "D" at the following Hwy 101 intersections: Neotsu, and N. 36th St. This document also cites peak LOS "E" at the following unsignalized intersections: N. 40th St., Holmes Rd, and N. 17th St. Other Hwy 101 intersections appear generally to operate at acceptable Levels of Service. However: "In some cases, the intersection is operating at an unacceptable LOS in the field, but the *calculated* LOS does not reflect this condition." 1

This is due to the absence of suitable gaps in the traffic stream along Hwy 101 to allow movements out of local unsignalized side streets, and left turns off of Hwy 101. The delay in making left turns **off** of Hwy 101 results in significant traffic queuing behind the turning vehicle.

ACCIDENT EXPERIENCE

In the five-year period from 1986 to 1990, there were 456 accidents on the Lincoln City street system. Most of these accidents were along Hwy 101, possibly due to the overall traffic congestion and number of intersections and local driveways along its length. Table 3 identifies the number of accidents at differenct intersections along Hwy 101 in 1989 and 1990. Intersections with the highest accident expericnce during this period include: N. 21st, S. 14th, S. 19th and S.48th/Galley Streets.

The Lincoln City Police Department tabulated the number of accidents along Hwy 101 (notably rear-end accidents) in the 1986-1990 period which could be corrected by the development of a protected left-turn lane.

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1 Transportation Impact Study-Hwy 101, Kittelson & Associates p. 15

BICYCLE/PEDESTRIAN FACILITIES

Figure 6 identifies existing bicycle routes in Lincoln City. Most of the route mileage is along Hwy 101, East and West Devils Lake Roads, 15and North Jetty and Harbor Avenues, with the bicycle routes primarily designated by signage alone. Along East Devils Lake Road and nominal portions of Hwy 101, bicyclists use the roadway shoulders and/or are separated from motor vehicles by painted edge ("fog") lines. Along most of the length of Hwy 101 and the other streets, bicycles must compete for roadway with motor vehicles.

Figure 7 identifies existing sidewalk locations and crosswalks in Lincoln City. Sidewalks are provided primarily along Hwy 101 through the Oceanlake, Delake and Taft commercial areas, and along S. 51st Street and North 22nd Street. Pedestrians are forced to walk along the roadway shoulder or actually on the street along most city roads, increasing the potential for pedestrian/vehicle mishaps.

Most of the pedestrian crosswalks are located in the Oceanlake, Delake and Taft commercial areas along Hwy 101 (see Fig. 7). Of the 28 designated crosswalks on Hwy 101, there are only eight which are signalized and provide controlled crossings. Most of the remaining 20 crosswalks have advance "pedestrian crossing" warning signs, but the signage is screened by parked vehicles at some locations.

STREET LIGHTING

Currently most of the *major* streets in Lincoln City have some level of street lighting. The exceptions are segments of West Devils Lake Road, S.E. 1st and 3rd Streets and S.W. 12th Street. There are also many *local* street segments without lighting. The streets that currently are not lighted, including local streets, are shown in Figure 8. Currently there are approximately 900 street lights in the city--about 60% mercury vapor fixtures and 40% high-pressure sodium fixtures. All street lights are owned and maintained by Pacific Power.

In 1985 there were 14.75 lights for every 100 people living in the city, and 15.72 lights per road mile. In 1985 the annual street light expenditure was about $106,000. This translated into an average pole charge of $1,012 per capita, and $18.71 per road mile. The 1985 street light expenditure was comprised of energy cost (52%), rental and maintenance (47%) and poles (1%).

PARKING

Currently in Lincoln City, public parking (outside of residential areas and off-street parking lots associated with specific businesses) is concentrated in three areas:

1. On-street parking along Hwy 101 through the Oceanlake, Delake and Taft Districts;

2. Parking at beach access locations, particularly at the Siletz Bay and "D" River waysides; and

3. New off-street public parking lots on N.W. 17th Street-west of Hwy 101, and on S.W. 50th/51st Streets in Taft.

Figure 9 identifies the number of public parking spaces in the commercial areas and at the beach access locations. Further discussion of parking availability follows.

Oceanlake/Delake/Taft Commercial Areas

Most of the existing on-street parking along Hwy 101 is in the Oceanlake commercial area between N. 12th and N. 22nd Streets. In this area there are 103 parallel parking spaces serving businesses along the street. In the Delake area there is a 31-space lot on the east side of Hwy 101 north of S. 3rd Street. These spaces are all signed for "One Hour Parking" between 9 AM and 6 PM.

In the Taft commercial area, between S. 48th Place and S. 51st Street, there are 61 on-street parking spaces--also signed for "One Hour Parking" between 9 AM and 6 PM.

Beach Access Locations

Beach access parking is primarily provided at four locations:

1.	"D" River Wayside	105 spaces
2.	Siletz Bay Wayside (along Hwy 101)	10 spaces
3.	Siletz Bay Park	20 spaces
4.	Public parking on S.W. 51st	67 spaces

There are another 67 on-street parking spaces along S. 51st Street between the Wayside and Hwy 101. At the "D" River Wayside, 10 spaces are reserved for recreational vehicles or trailers.

There are six other beach access locations where very limited parking is available, totaling 29 spaces. The locations are:

- North 40th Street - 10 spaces
- North 35th Street - 4 spaces (includes 1 handicap space)
- North 26th Street - 10 spaces
- North 21st Street - 4 spaces (includes 1 handicap space)
- South 11th Street - 5 spaces (includes 1 handicap space)
- South 35th Street - 2 spaces (includes 1 handicap space)

At N. 15th Street there is direct ramp access to the beach, with parking allowed on the beach.

TRANSIT SERVICE

Despite the absence of fixed route public transportation in Lincoln City, the city is currently served by other forms of transportation. These include intra-city buses, taxicabs, church vans, school buses and specialized transportation provided by local human service agencies. This analysis looks at the three main providers of transit service in Lincoln City:

1. Lincoln County Council on Aging Dial-A-Ride

2. Lincoln Taxi Service
3. Lincoln City Senior Center Bus

The type of service provided, service levels, service cost and system/service issues and concerns are highlighted below. In addition to the currently available options, this overview describes two fixed-route transit service *demonstration projects*.

The Lincoln County Council on Aging Dial-A-Ride

This Dial-A-Ride service is a demand-responsive system funded by Lincoln County and the cities of Lincoln City and Newport through county Special Transportation Funds and city general funds. This curb-to-curb service is provided Monday through Friday from 8:30 AM to 5:00 PM by the Lincoln County Council on Aging. No fare is charged, but donations are encouraged. The service is, in theory, open to the general public. However, the elderly and disabled receive priority and make up the majority of the riders.

The service is operated with seven 14-passenger vans and one reserve vehicle (see Table 4 for fleet specifications). All but two of the vans are in good to fair condition , and five of them are equipped with a wheelchair lift. The Council on Aging expects to receive a grant for two new 14-passenger lift-equipped vehicles in 1995. Maintenance on the vans that serve the city of Newport and the county is provided at the Lincoln County Public Works Department. Maintenance on the two vans that service Lincoln City is provided by the city's Vehicle Maintenance Section.

The system has numerous volunteer drivers in its data base, with 14 volunteers providing the service on a regular basis. The drivers receive training in defensive driving, passenger sensitivity and passenger assistance.

In addition to the drivers, the Dial-A-Ride service has three paid staff positions: a transportation manager, a dispatcher and an administrative assistant. Lincoln City staff also provide some administrative time to the vans that service their area. All the dispatching is done through the Lincoln County Council on Aging office in Newport, and riders are encouraged to call a day in advance. There are no trip restrictions; the service is available on a first come first served basis with the elderly and disabled receiving priority.

Operating costs for the system are approximately $250,000 annually. About 5% of that is farebox revenue--the amount received in donations. Ridership statistics indicate that about 20% (22,000) of the system's total boarding ridership, 118,000 (one-way trips) comes from the Lincoln City area.

The majority of trips (8,740) in Lincoln City are to local shopping areas, including grocery and retail centers. Trips to worksites (4,676 - includes volunteer workers), medical appointments (1,023), social activities (2,166 - emphasis on the Community Center activities) and meal trips within Lincoln City (582 for trips to the mealsite, and 1,780 for meals to other locations).

Strengths and Weaknesses

The system provides an inexpensive transportation option for the senior and disabled populations in Lincoln County. The demand responsive system works well for the type of trips and/or the individuals they serve.

Despite the system's attempt to serve the general public, demand requires that seniors and disabled are first priority. This makes the use of the vans somewhat uncertain for the general public. In addition, despite the extensive services, the system is not able to handle the demand, especially since the service relies upon volunteer drivers. The provider indicated that this was expecially true for the intercity demand (e.g. Lincoln City - Newport, Waldport - Newport, etc.) Additional operating funds and poid drivers would make the system more responsive and reliable.

Lincoln Taxi Service

The taxi service in Lincoln County is privately provided 24 hours a day, seven days a week. Fares are $1.75 base rate and $1.90/mile. There is a 10% reduction for senior and disabled patrons.

Lincoln Taxi Service has two 5-passenger cars and two 10-passenger vans available for passenger transport, none of them wheelchair accessible. The taxi employs four full-time drivers.

Currently the system carries approximately 800-1,200 individuals a month during the seasonal off-peak periods (September-June), and about 1,200-2,000 a month during the seasonal-peak periods (June-September). The provider estimates the split between local residents and out of town guest to be about 50-50 during the off-peak and approximately 30-70 during the peak periods.

System Strength and Weaknesses

The Lincoln Taxi Service provides alternative options to the community on a 24 hour basis. It is well run, well marketed, and it provides direct and convenient service.

The service is expensive. The cost of the trip from Lincoln City to Newport would cost over $45 one-way. The vehicles are not currently wheelchair accessible.

Lincoln City Senior Center Bus Service

The Lincoln City Senior Center provides a noontime mealsite transportaion on Mondays, Wednesdays and Fridays plus a noontime shopping run on Thursdays. The service is available to the senior and disabled population in Lincoln City, and is provided by a 1991 12-passenger van which is not wheelchair accessible and a volunteer driver. Seniors who wish to use the service call to schedule in advance. All seniors requesting transportation are accommodated. The provider estimates that they provide about 1,200 one-way trips/year. No fare is charged; however, donations are accepted.

System Strengths and Weaknesses

This service provides an additional alternative transportation option for seniors for mealsite and shopping trips. Since the service is targeted, the center is able to meet demand.

The system provides a service similar to the Lincoln County Council on Aging's Dial-A-Ride. While they are able to meed demand, the system only offers service for specific trips, and only to the elderly and disabled community.

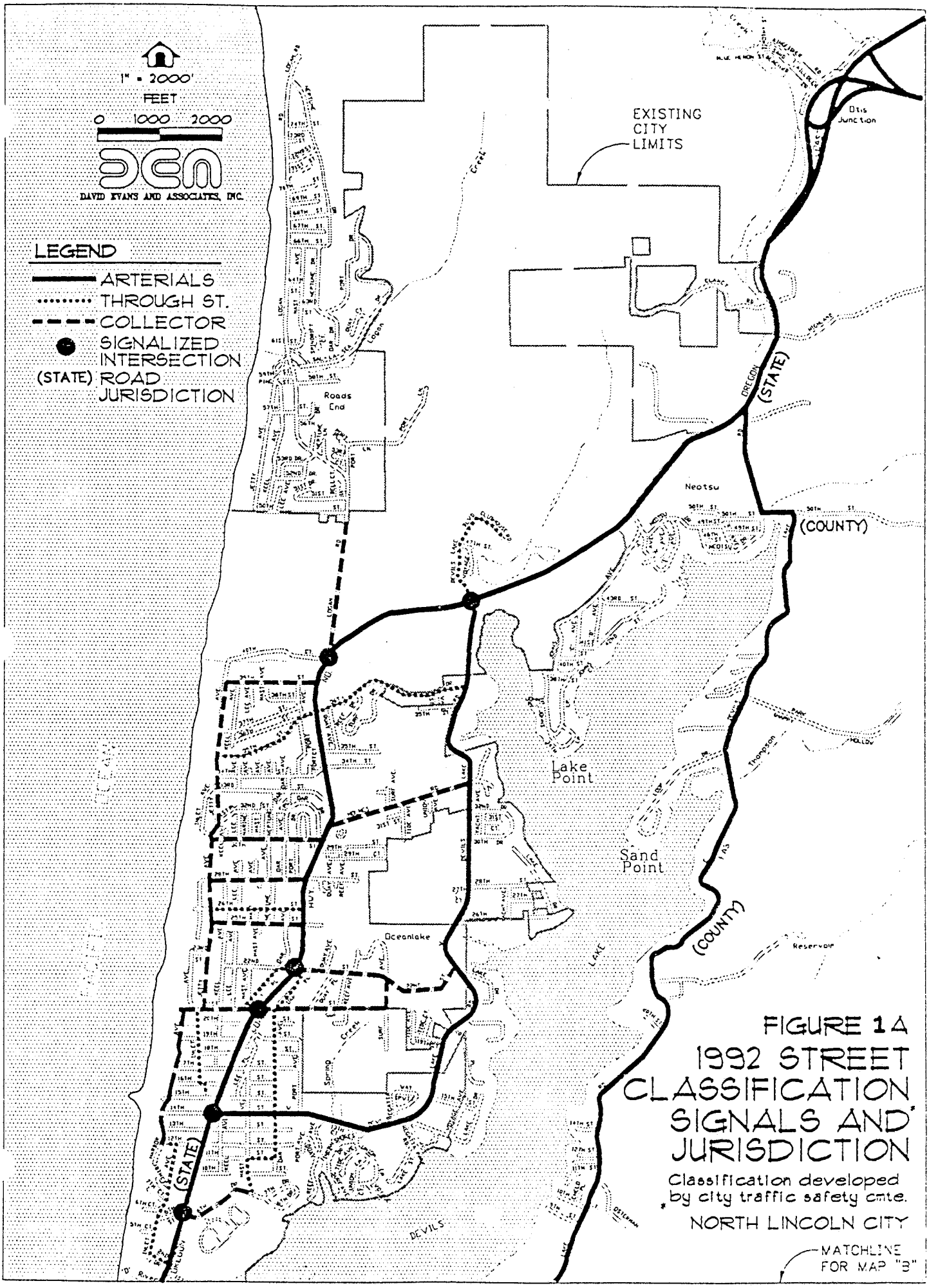


FIGURE 1A
1992 STREET CLASSIFICATION SIGNALS AND JURISDICTION*

Classification developed by city traffic safety cmte.

NORTH LINCOLN CITY

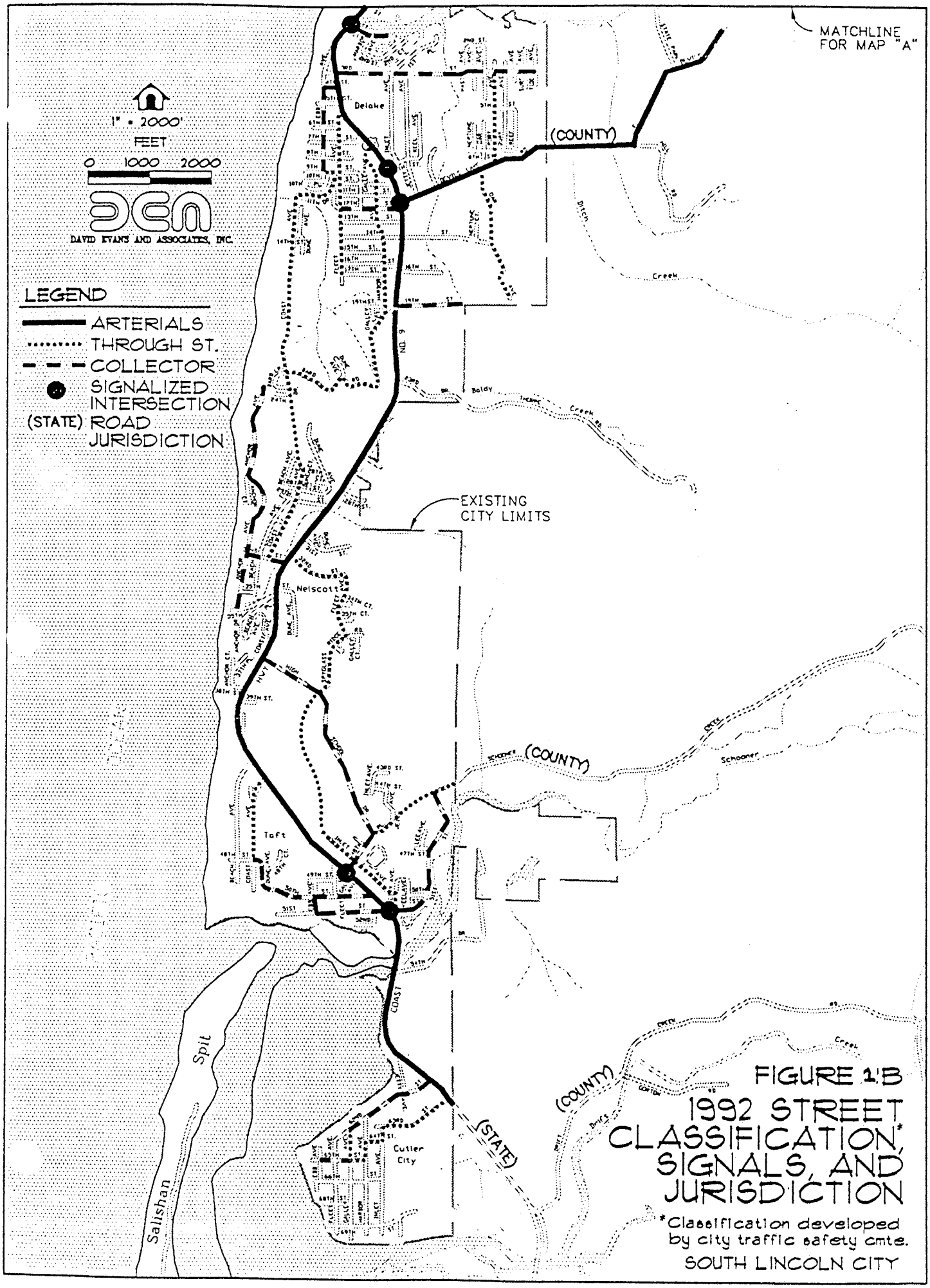


FIGURE 1B

1992 STREET CLASSIFICATION*, SIGNALS, AND JURISDICTION

*Classification developed by city traffic safety cmte.

SOUTH LINCOLN CITY

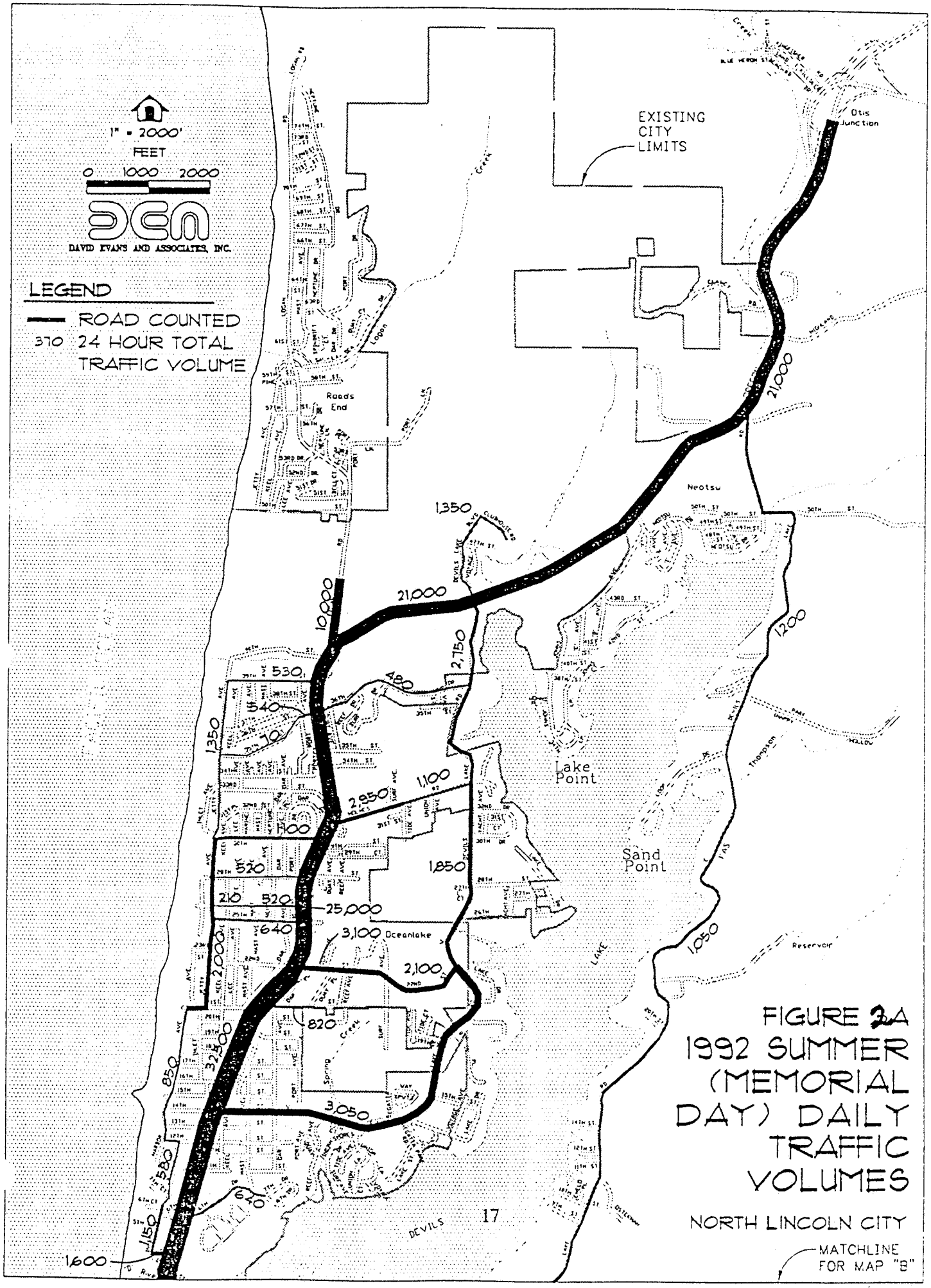


FIGURE 2A
1992 SUMMER (MEMORIAL DAY) DAILY TRAFFIC VOLUMES
NORTH LINCOLN CITY

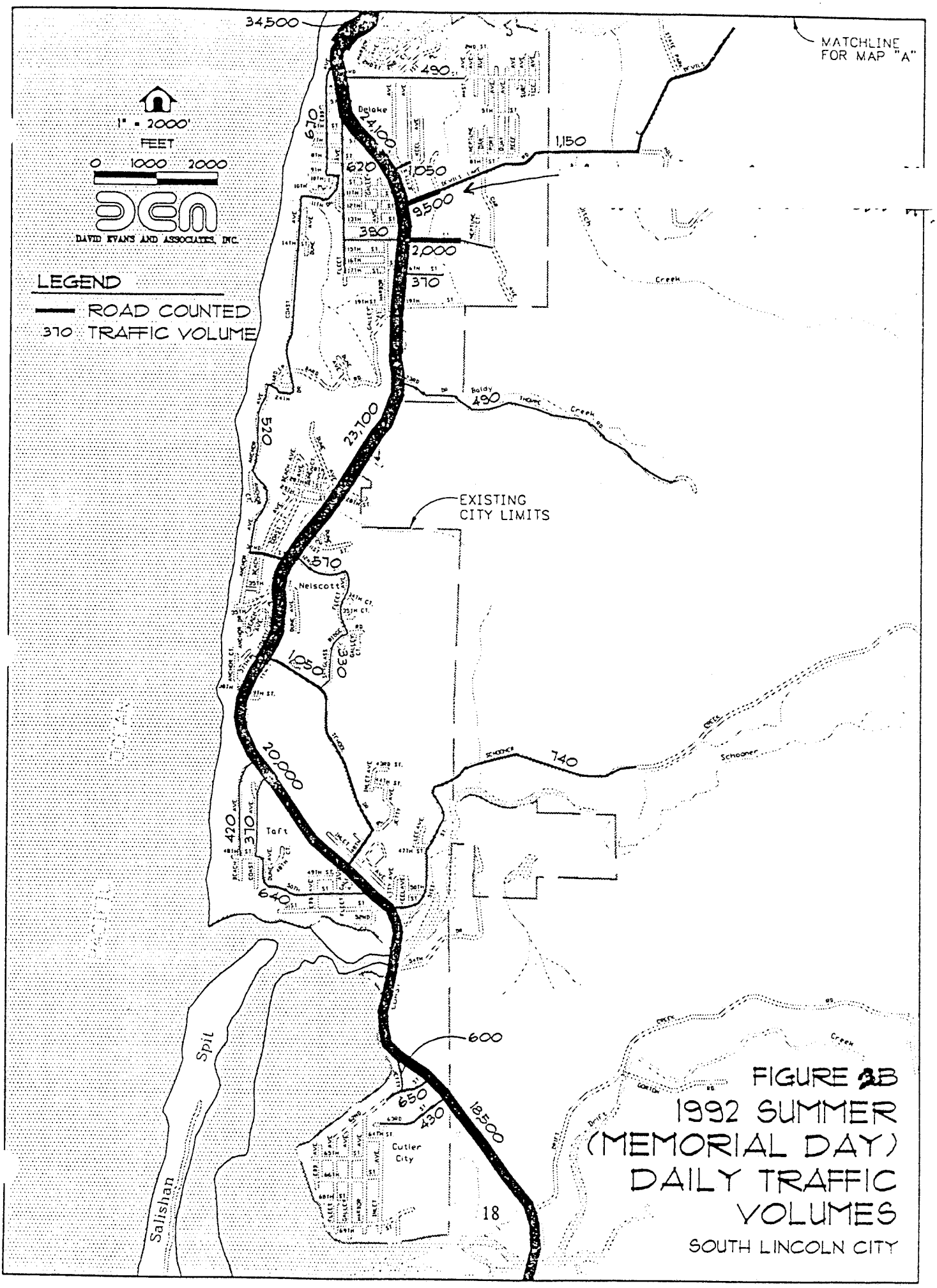


FIGURE 3B
1992 SUMMER (MEMORIAL DAY) DAILY TRAFFIC VOLUMES
SOUTH LINCOLN CITY

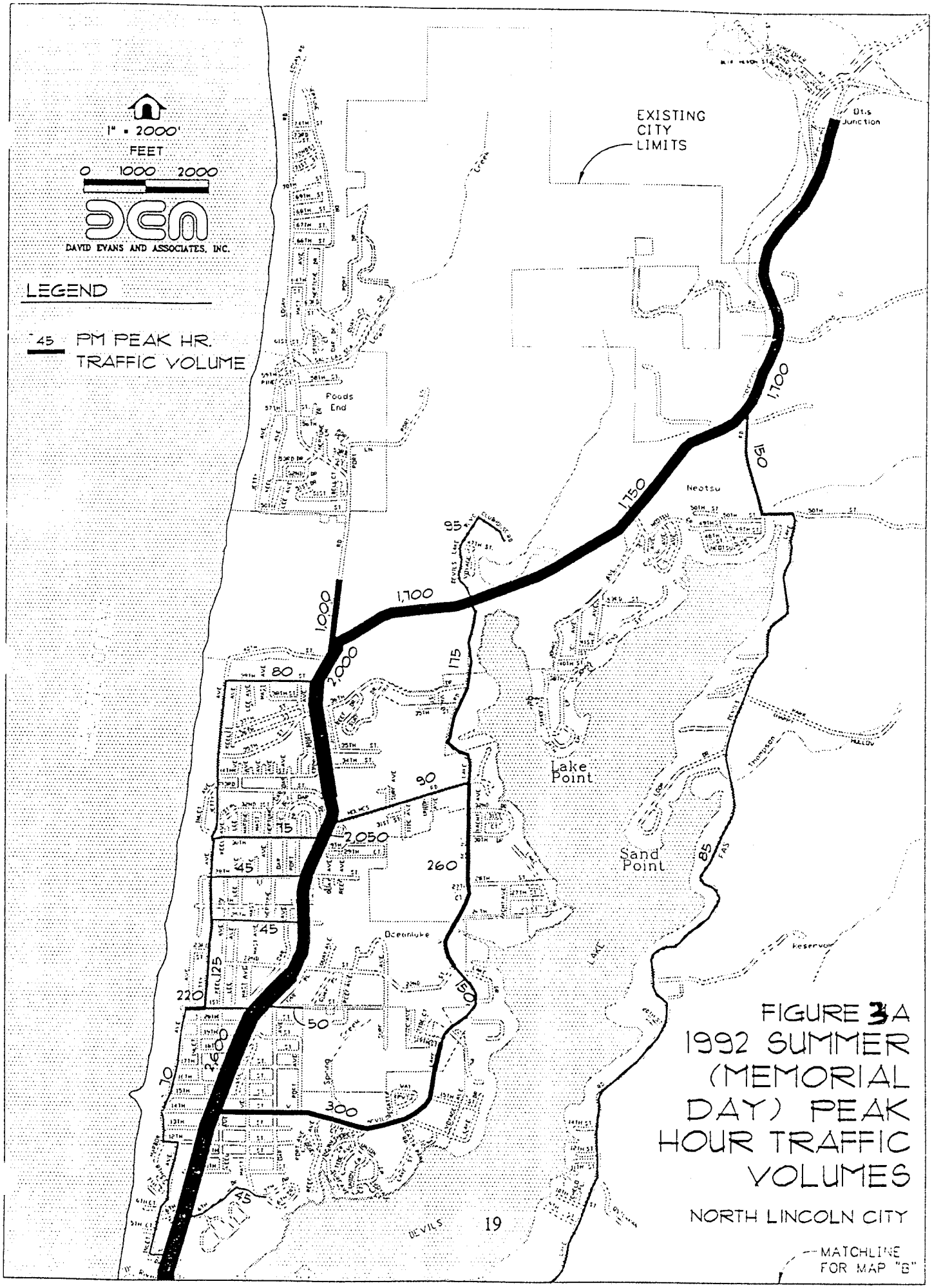


FIGURE 3A
1992 SUMMER (MEMORIAL DAY) PEAK HOUR TRAFFIC VOLUMES

NORTH LINCOLN CITY

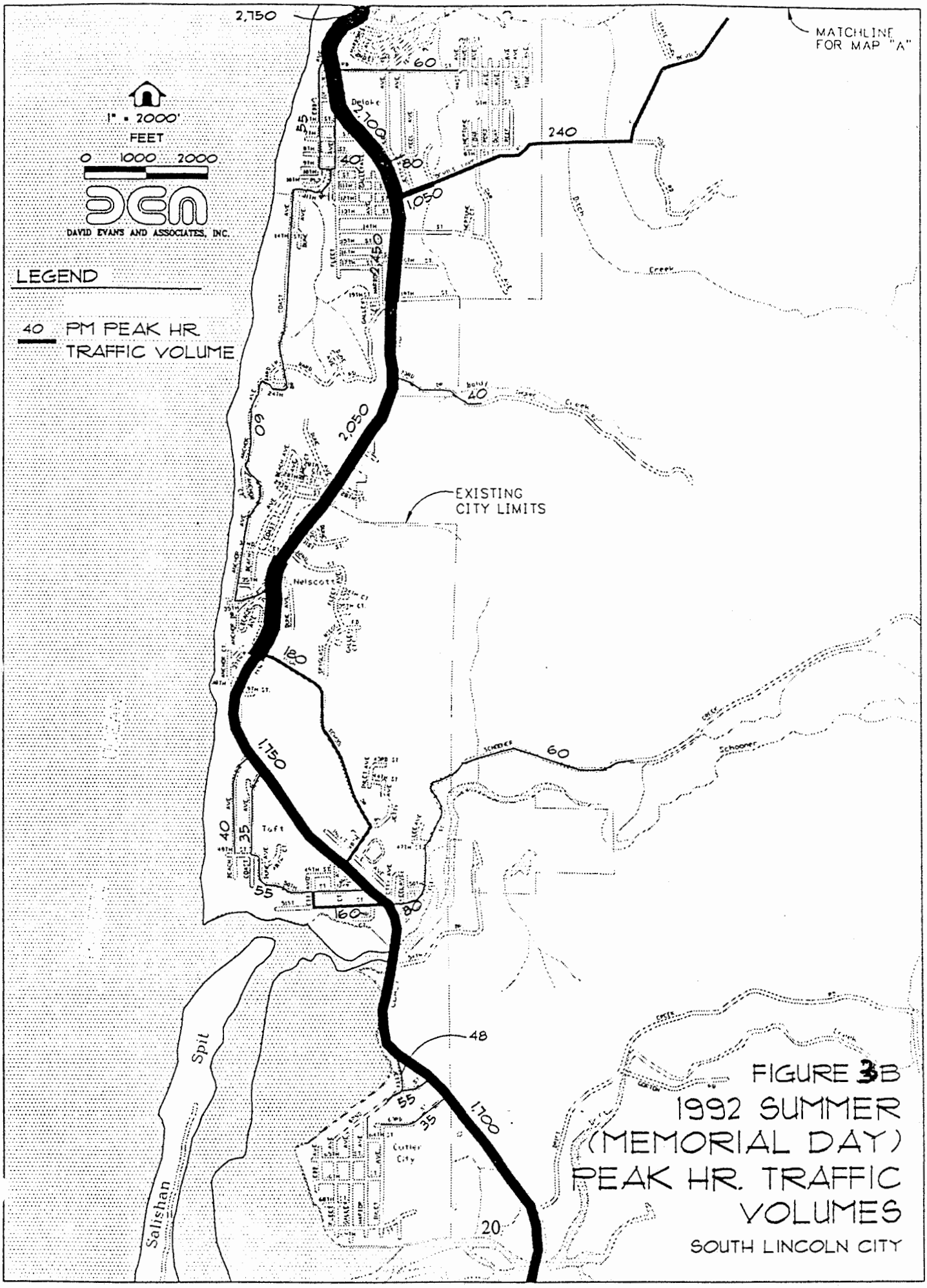


FIGURE 3B
1992 SUMMER (MEMORIAL DAY) PEAK HR. TRAFFIC VOLUMES
SOUTH LINCOLN CITY

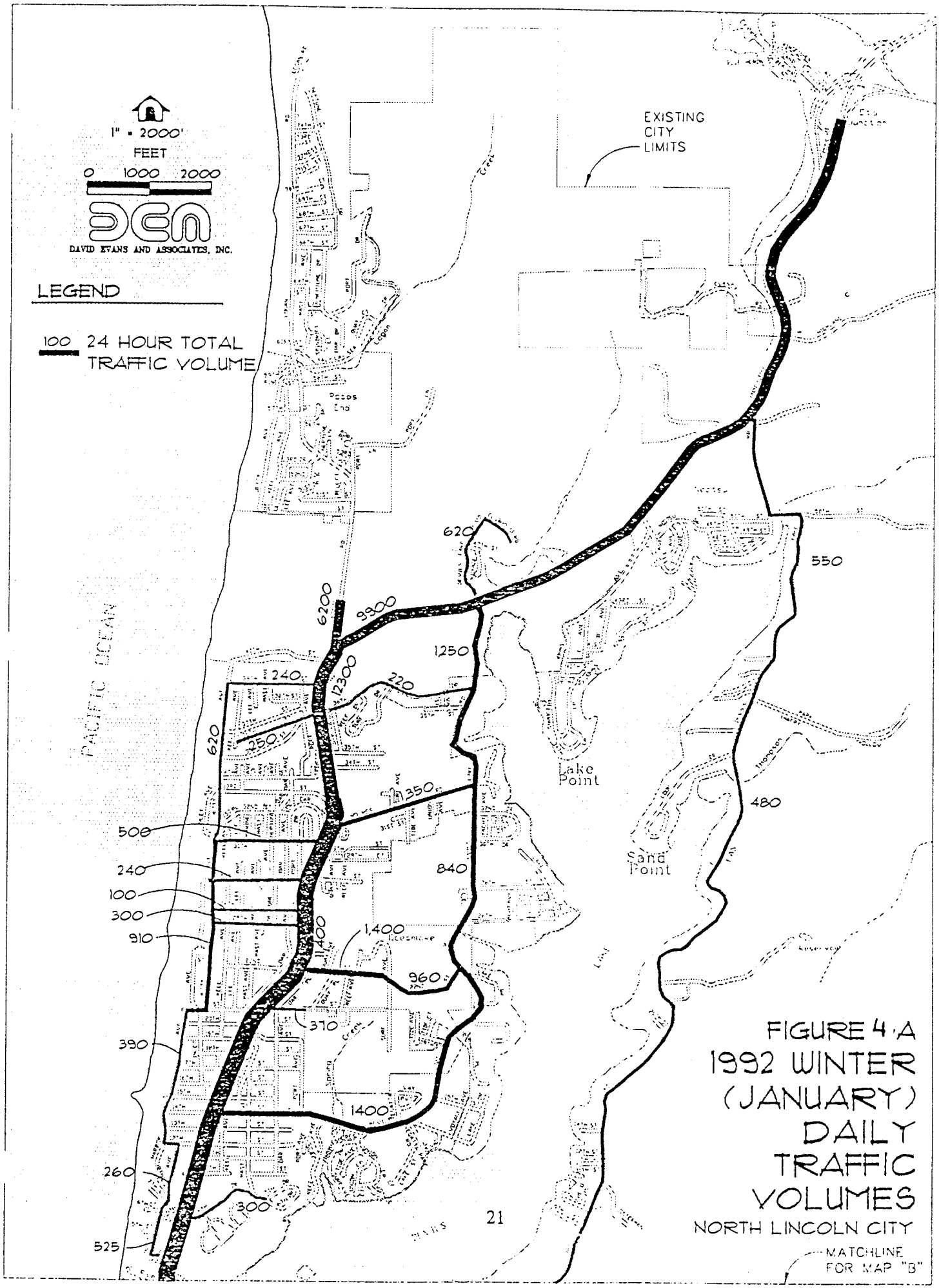


FIGURE 4-A
1992 WINTER (JANUARY) DAILY TRAFFIC VOLUMES
NORTH LINCOLN CITY

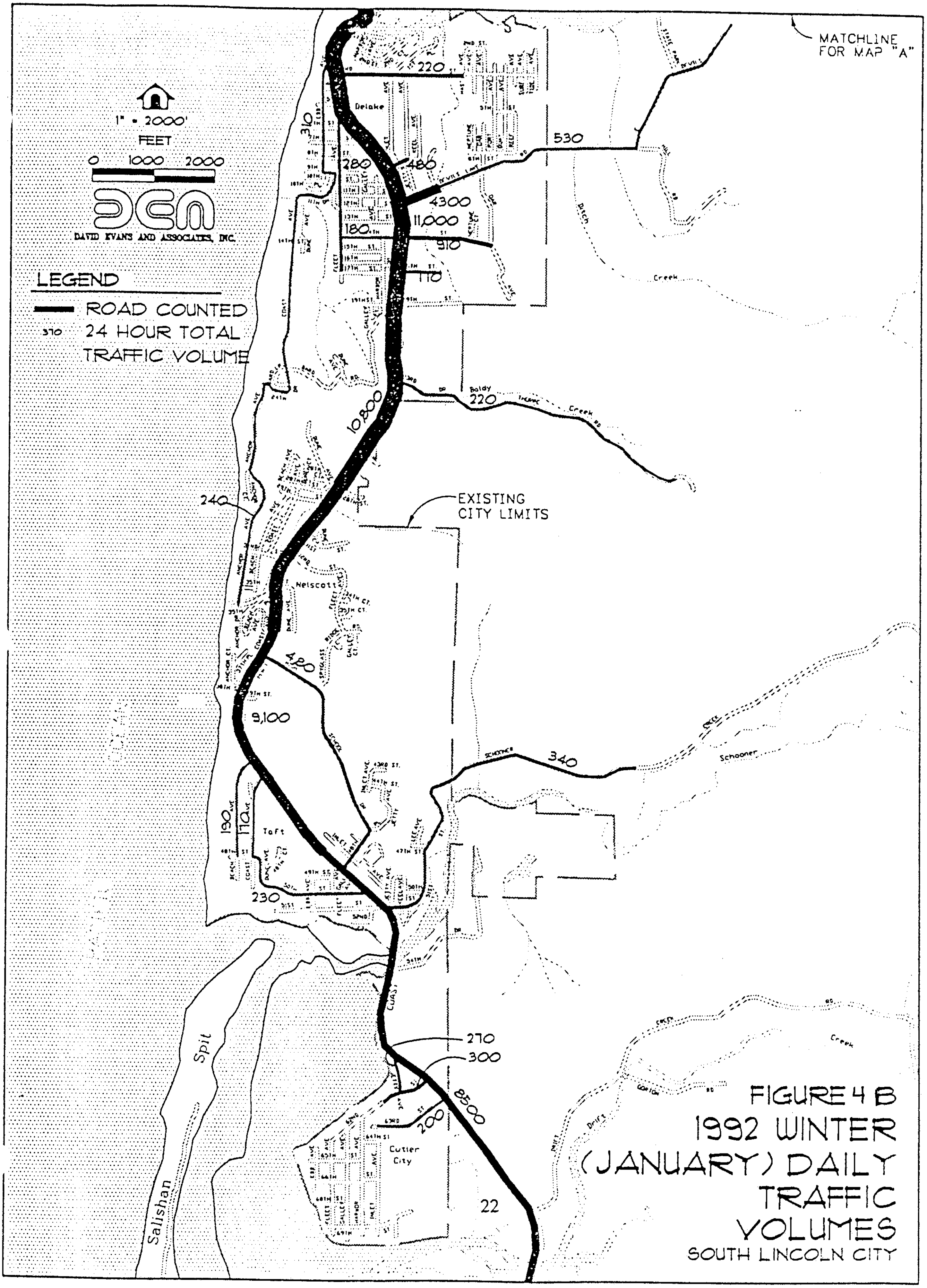


FIGURE 4 B
1992 WINTER (JANUARY) DAILY TRAFFIC VOLUMES
SOUTH LINCOLN CITY

TABLE 2
CURRENT INTERSECTION CAPACITY AND LEVEL OF SERVICE

	Friday PM Peak Hour	Saturday PM Peak Hour
US 101 & E. Devils Lake Road		A/E
US 101 & W. Devils Lake Road	0.69C	
US 101 & N.W. Logan Road	0.74D	0.76D
US 101 & N. 22nd Street		0.68C
US 101 & N. 21st Street	0.55B	
US 101 & N. 14th Street		0.53B
US 101 & S. 1st Street	0.64C	0.71C-D
US 101 & S. 12th Street/ E. Devils Lake Road	0.77D	0.74D
US 101 & S. 51st Street	0.45A	

A/E = Level of service A for the left turn movement on US 101 and level of service E for the E. Devils Lake Road approach.

0.69C = Volume to capacity ratio 0.69, or 69 percent of capacity utilized by traffic and intersection level of service C.

C - D = Borderline condition between level of service C and D.

TABLE 3
MOTOR VEHICLE ACCIDENT DATA BY YEAR

Location	1990	1989
On Highway 101		
W. Devils Lake Road	2	*
N.W. Logan Road	3	2
N.E. Holmes Road	*	3
N. 28th Street	*	4
N. 25th Street	*	2
N. 22nd Street	4	*
N. 21st Street	4	7
N. 17th Street	7	*
N.W. 16th Street	*	4
N. 15th Street	*	4
N. 14th Street	4	3
N. 13th Street	3	*
N. 6th Street	*	4
S.E. 1st Street	*	2
S.W. 2nd Street/S.E. Ebb Street	*	3
S. 3rd Street	2	*
S. 5th Street	3	3
S. 6th Street	3	*
S. 9th Street	2	*
S.W. 12th St./S.E. East Devils Lake Rd.	3	*
S. 14th Street	9	2
S. 16th Street	*	4
S. 19th Street	7	7
S.E. 23rd Street	3	*
S. 27th Street	*	2
S.W. 29th Street	*	2
S.E. 31st Street	*	3
S. 35th Street	4	*
S. 47th Street	*	3
S.W. 48th/Galley Street	7	4
S.W. 50th Street	3	*
S. 51st Street	5	4
S.E. 54th Street	3	*
S.W. Jetty Avenue	3	*

* Locations with less than two motor vehicle accidents

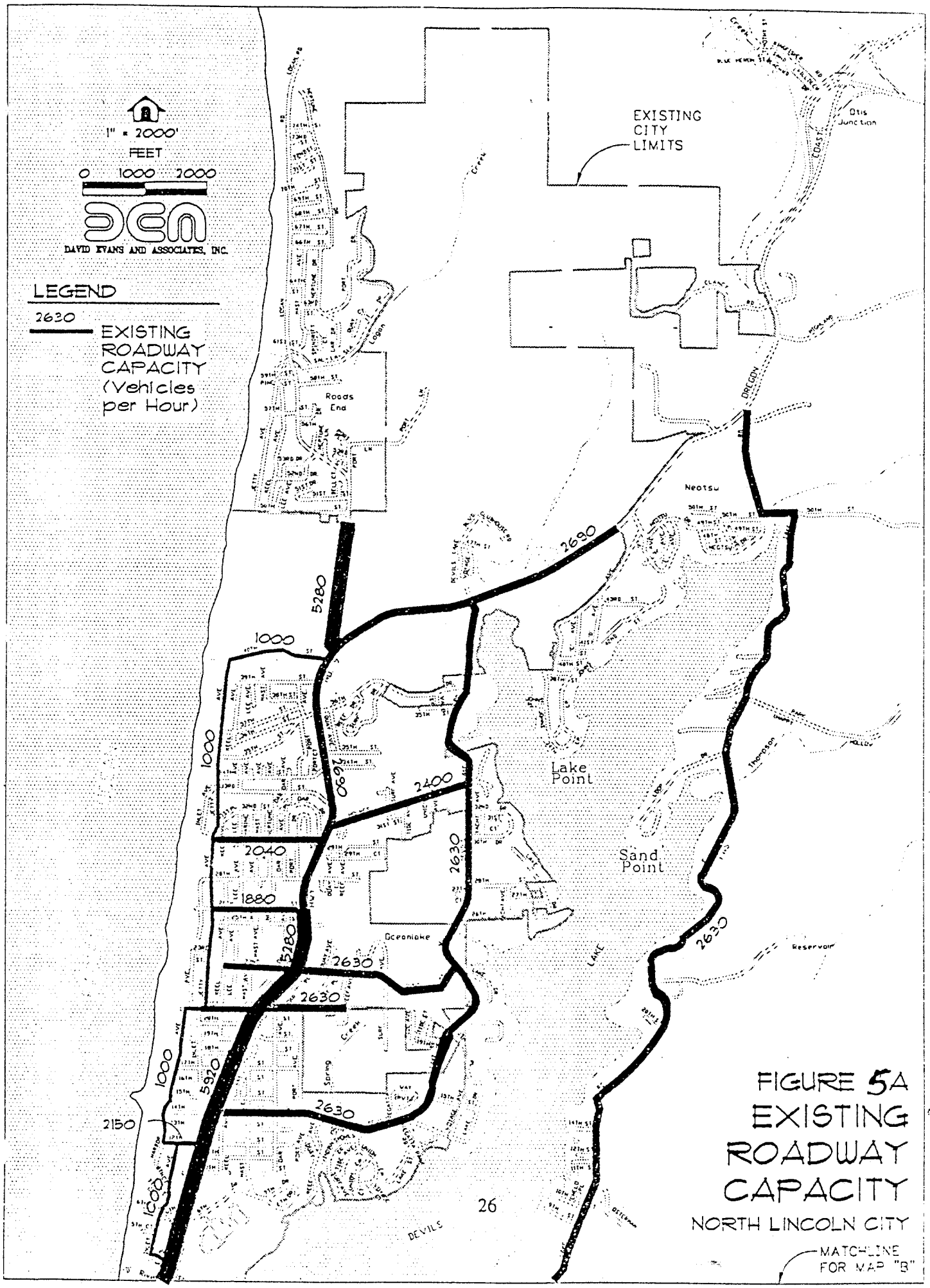


FIGURE 5A
EXISTING ROADWAY CAPACITY
NORTH LINCOLN CITY

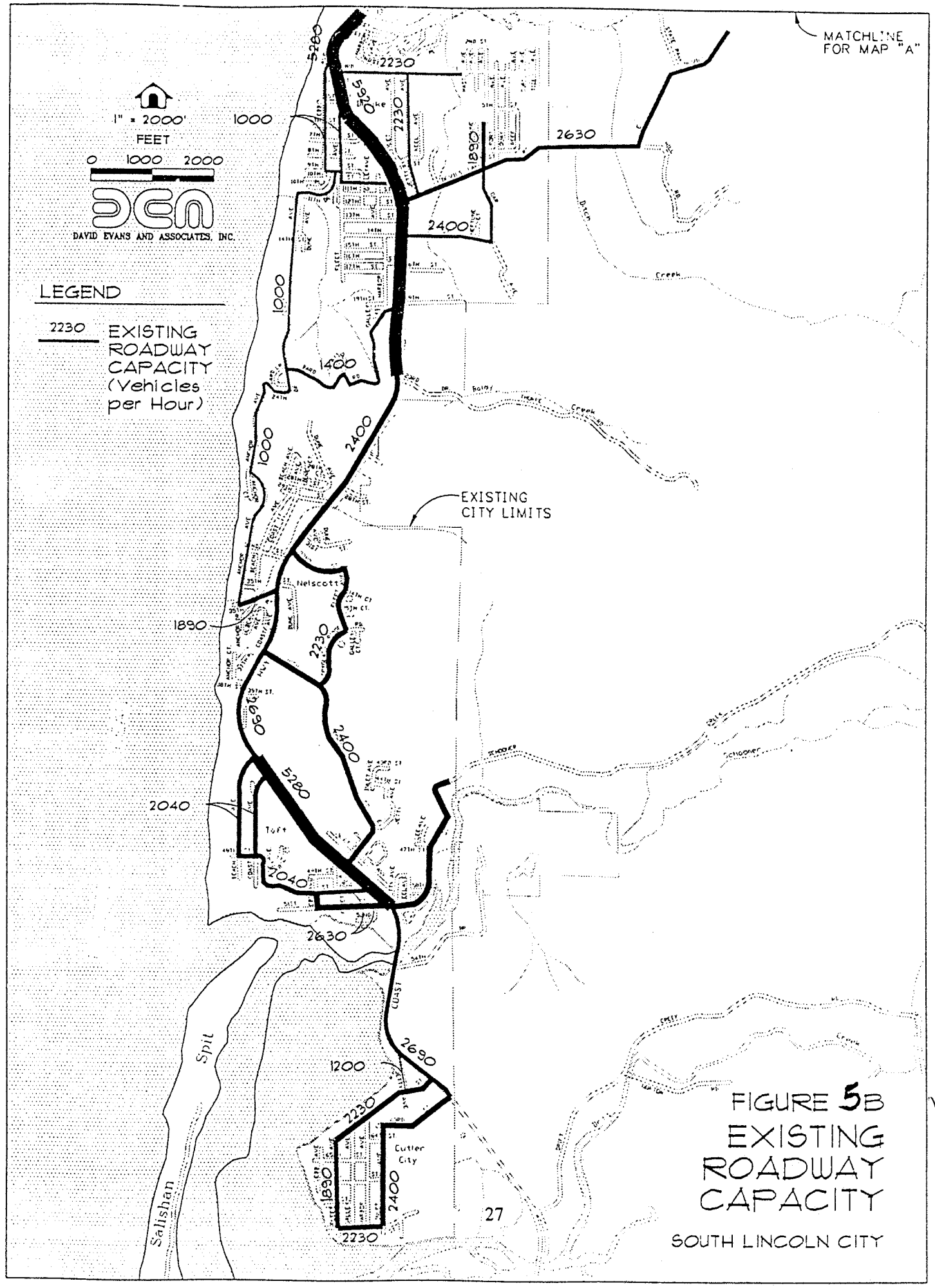


FIGURE 5B
EXISTING ROADWAY CAPACITY
SOUTH LINCOLN CITY

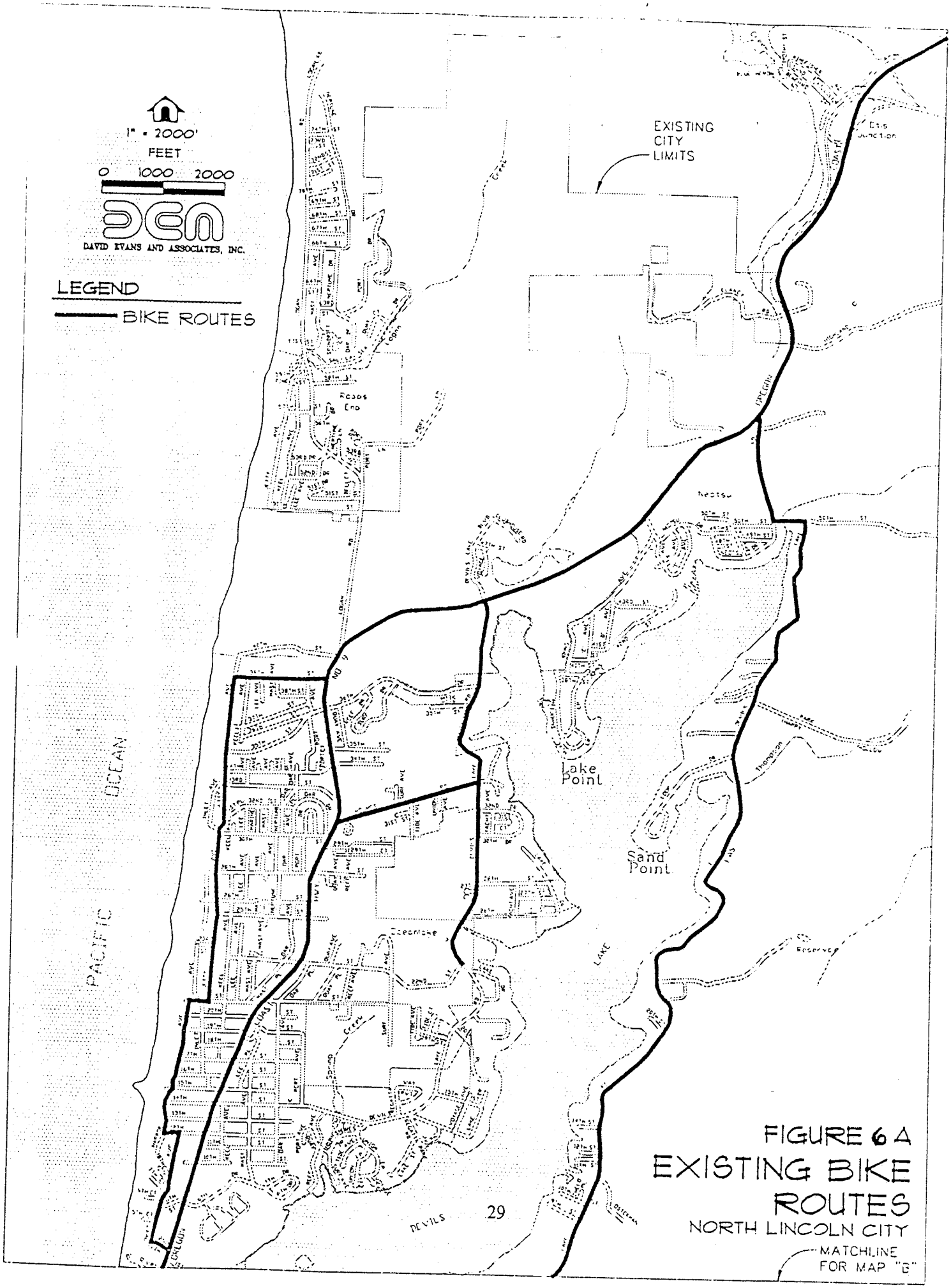


FIGURE 6A
EXISTING BIKE ROUTES
NORTH LINCOLN CITY

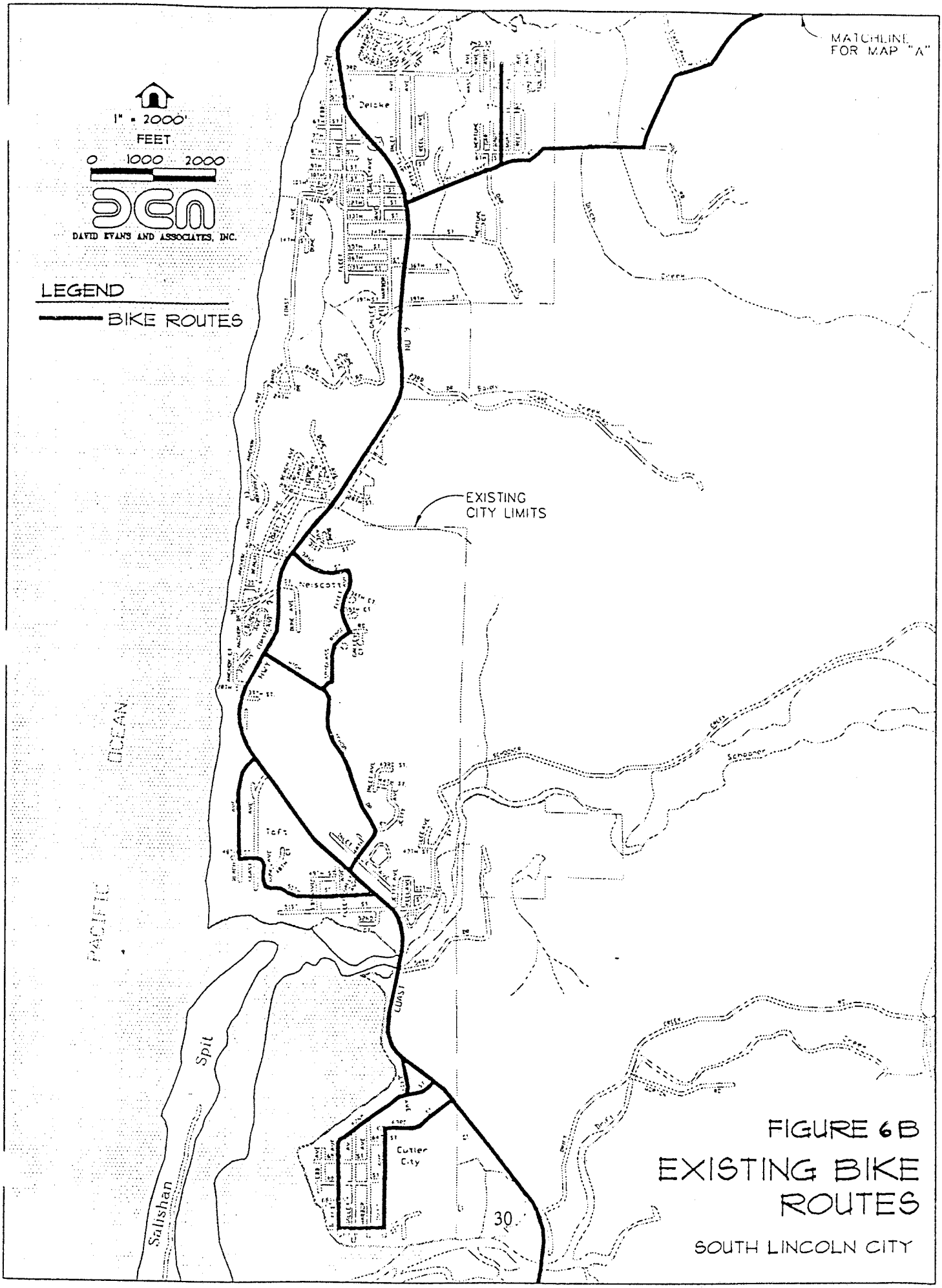


FIGURE 6B

EXISTING BIKE ROUTES

SOUTH LINCOLN CITY

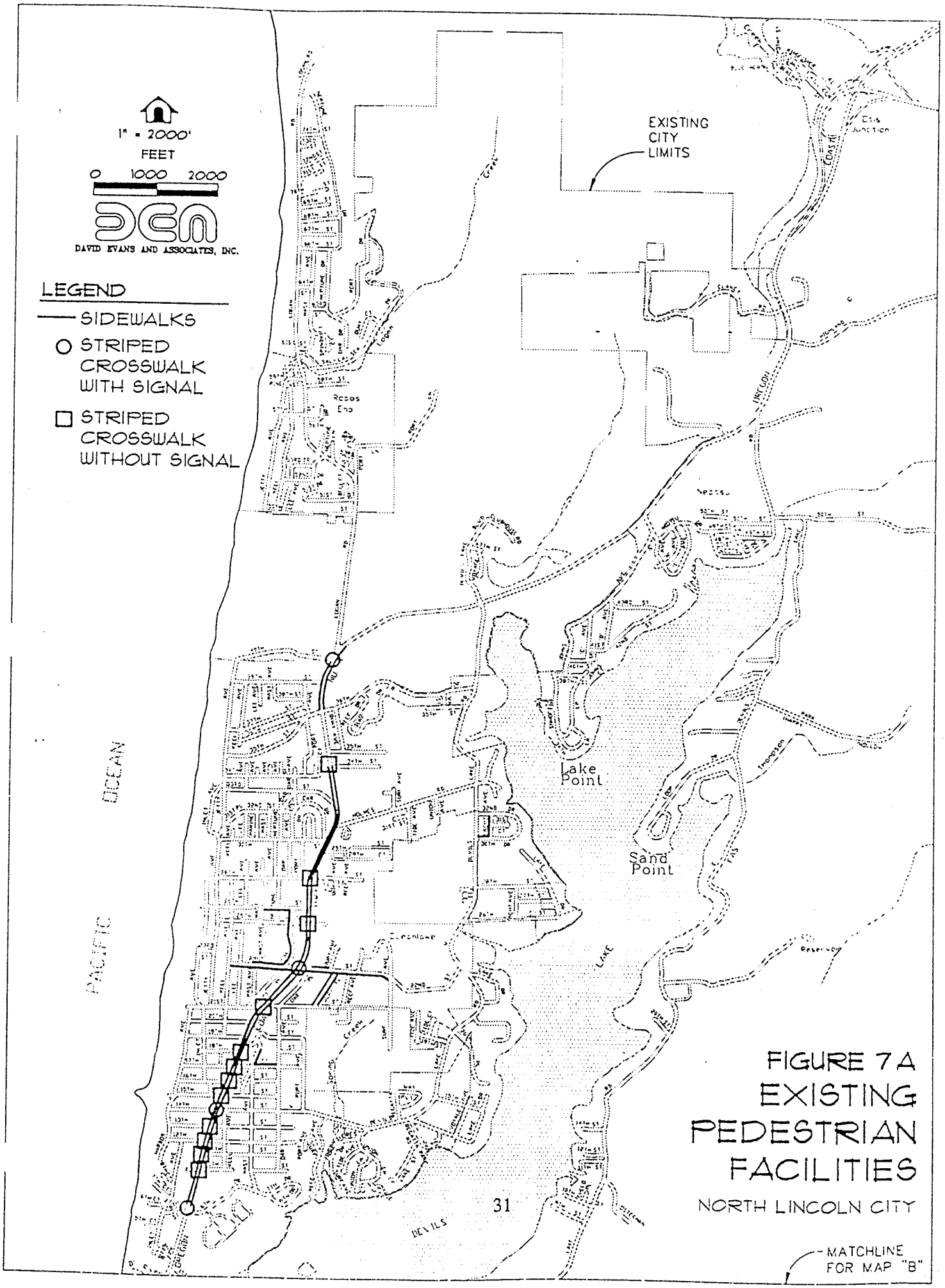


FIGURE 7A
EXISTING PEDESTRIAN FACILITIES
NORTH LINCOLN CITY

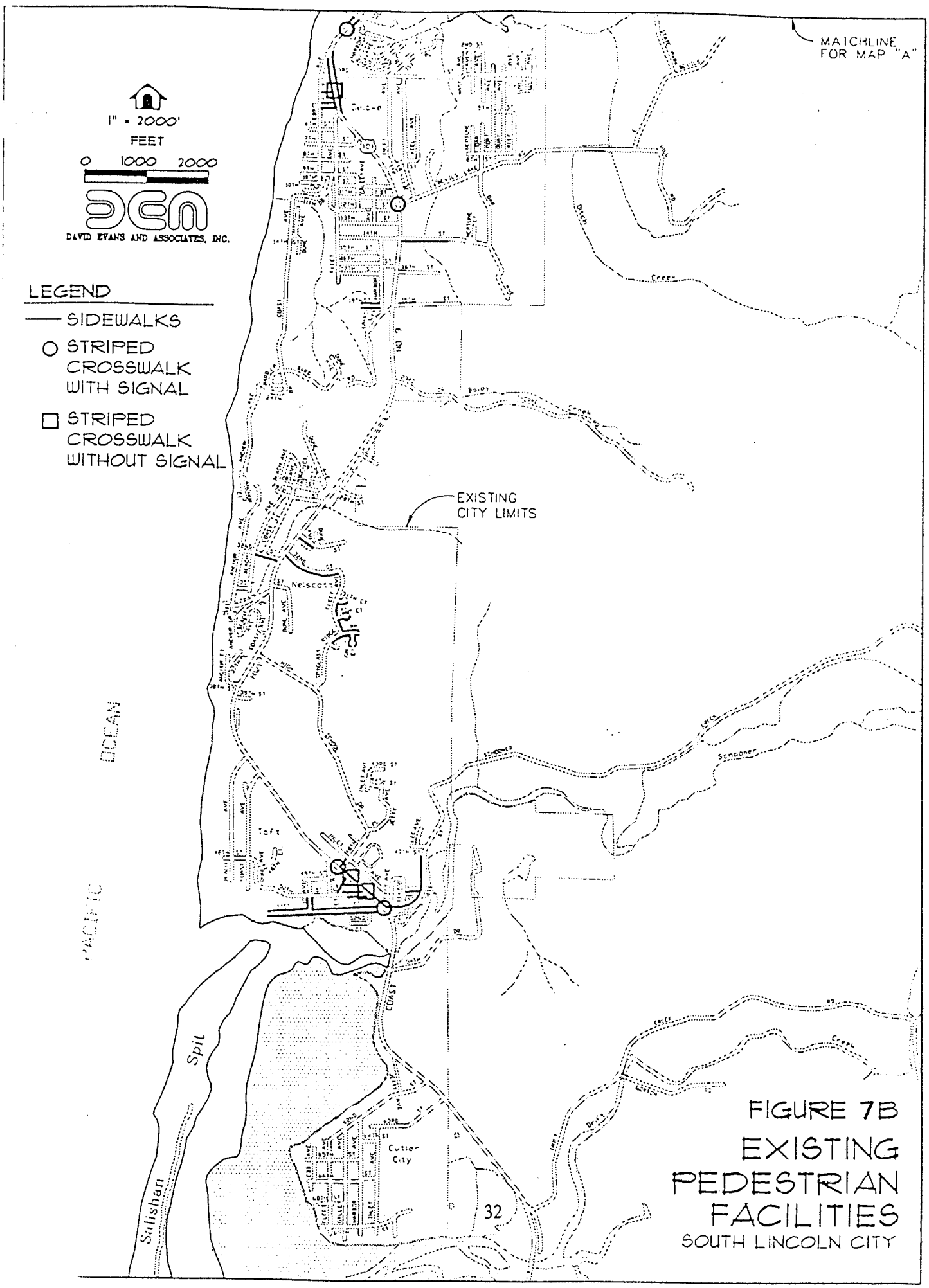


FIGURE 7B
EXISTING PEDESTRIAN FACILITIES
SOUTH LINCOLN CITY

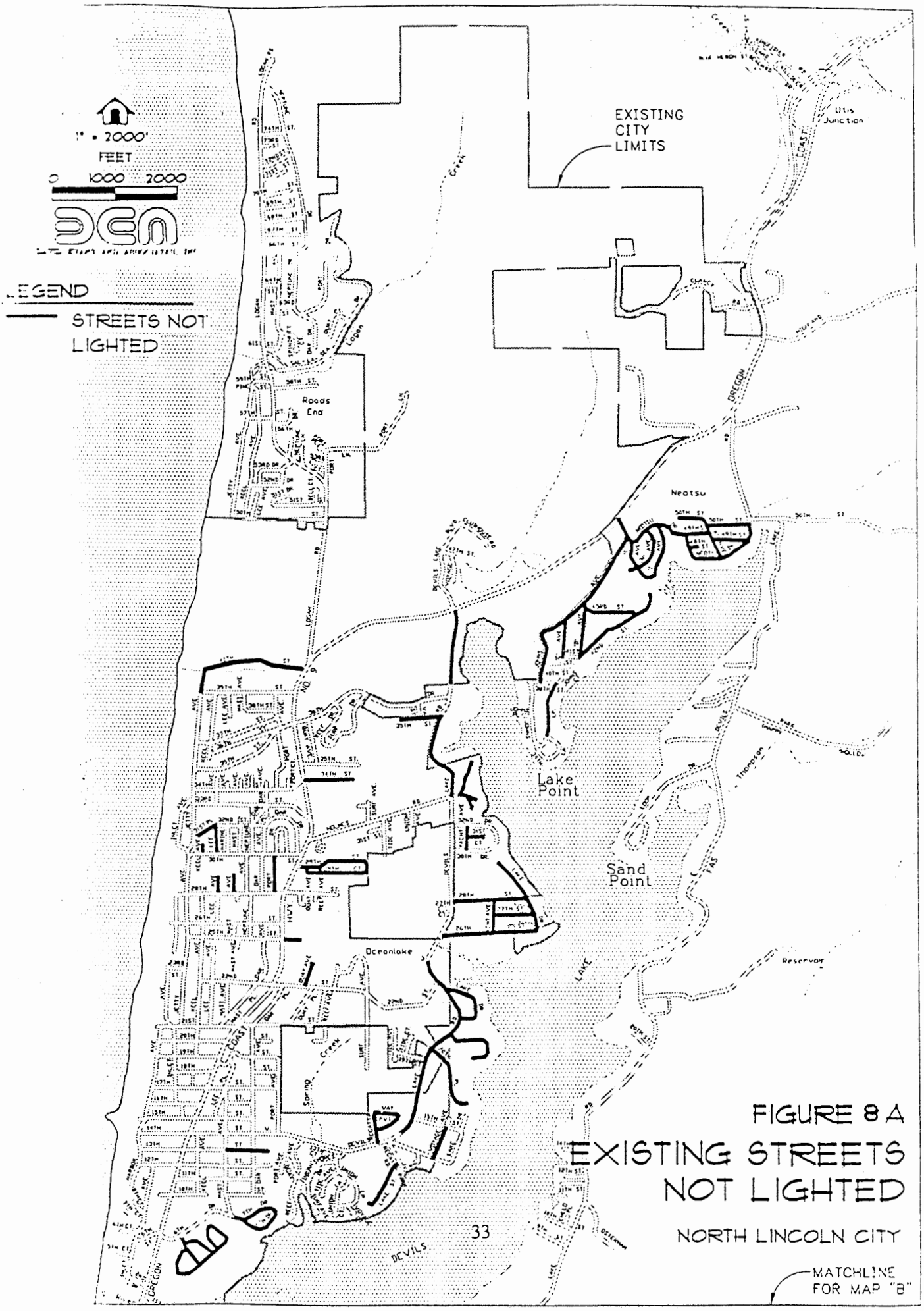


FIGURE 8 A

EXISTING STREETS NOT LIGHTED

NORTH LINCOLN CITY

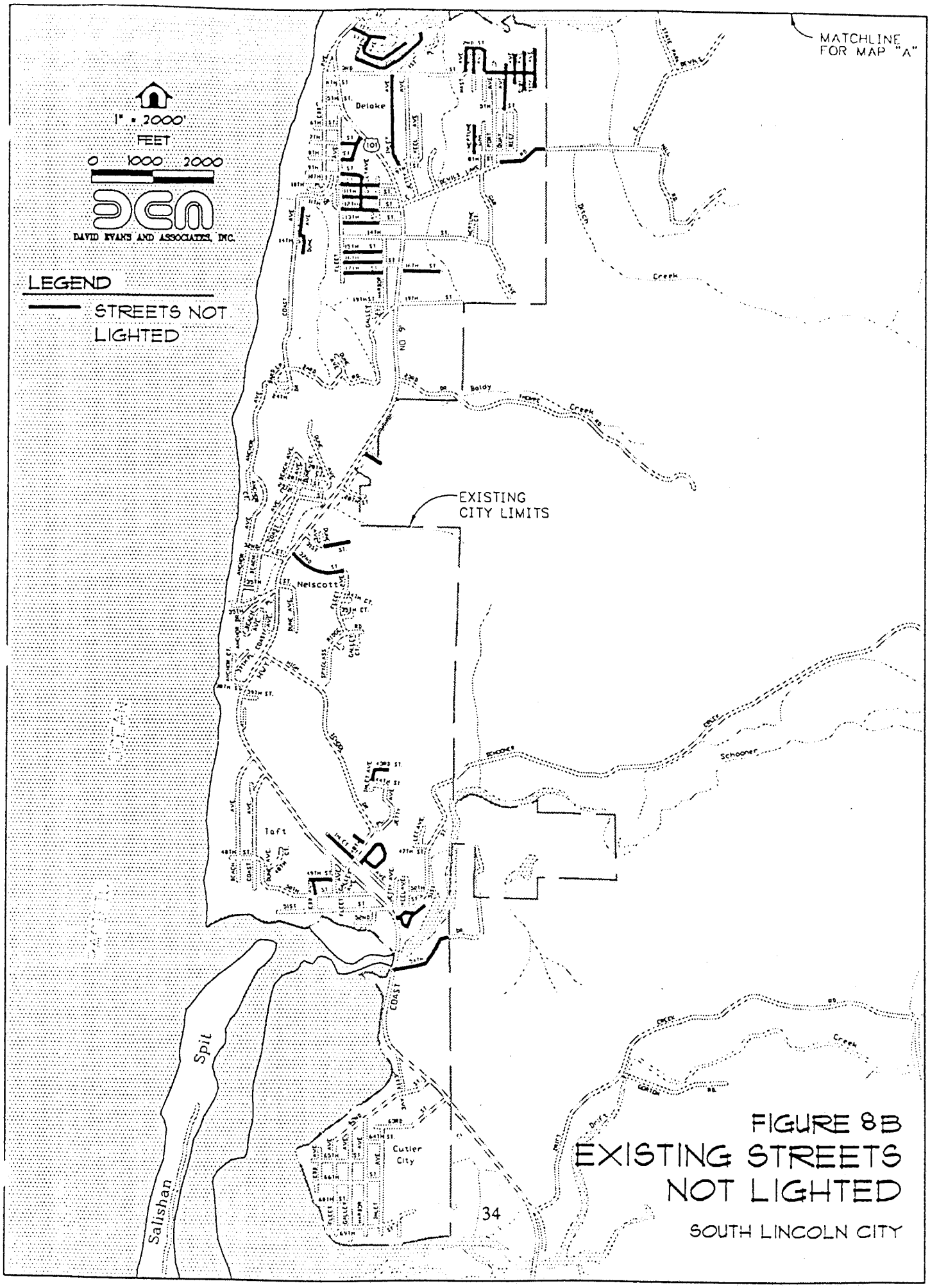


FIGURE 8B
EXISTING STREETS NOT LIGHTED
SOUTH LINCOLN CITY

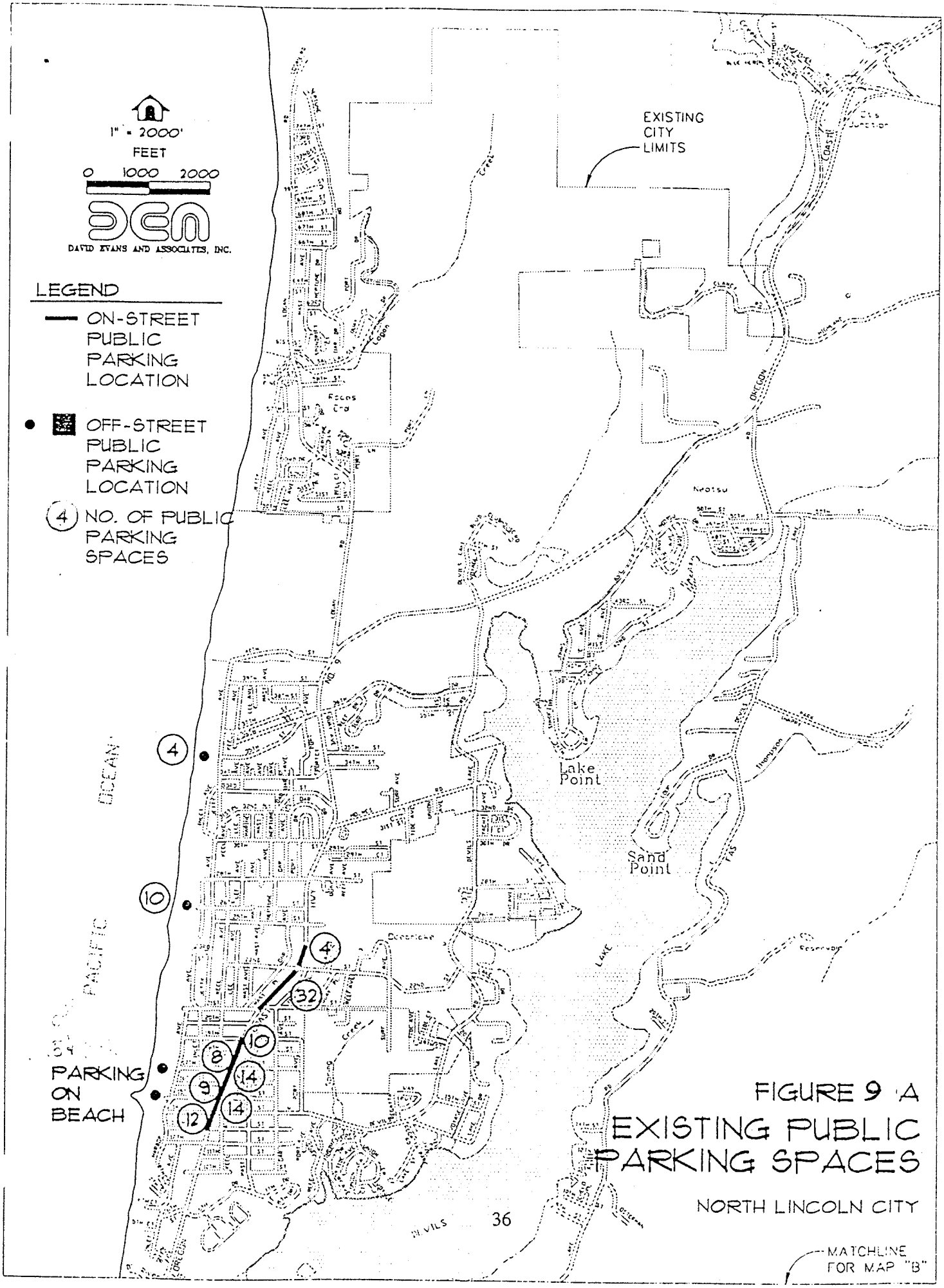


FIGURE 9 A

EXISTING PUBLIC PARKING SPACES

NORTH LINCOLN CITY

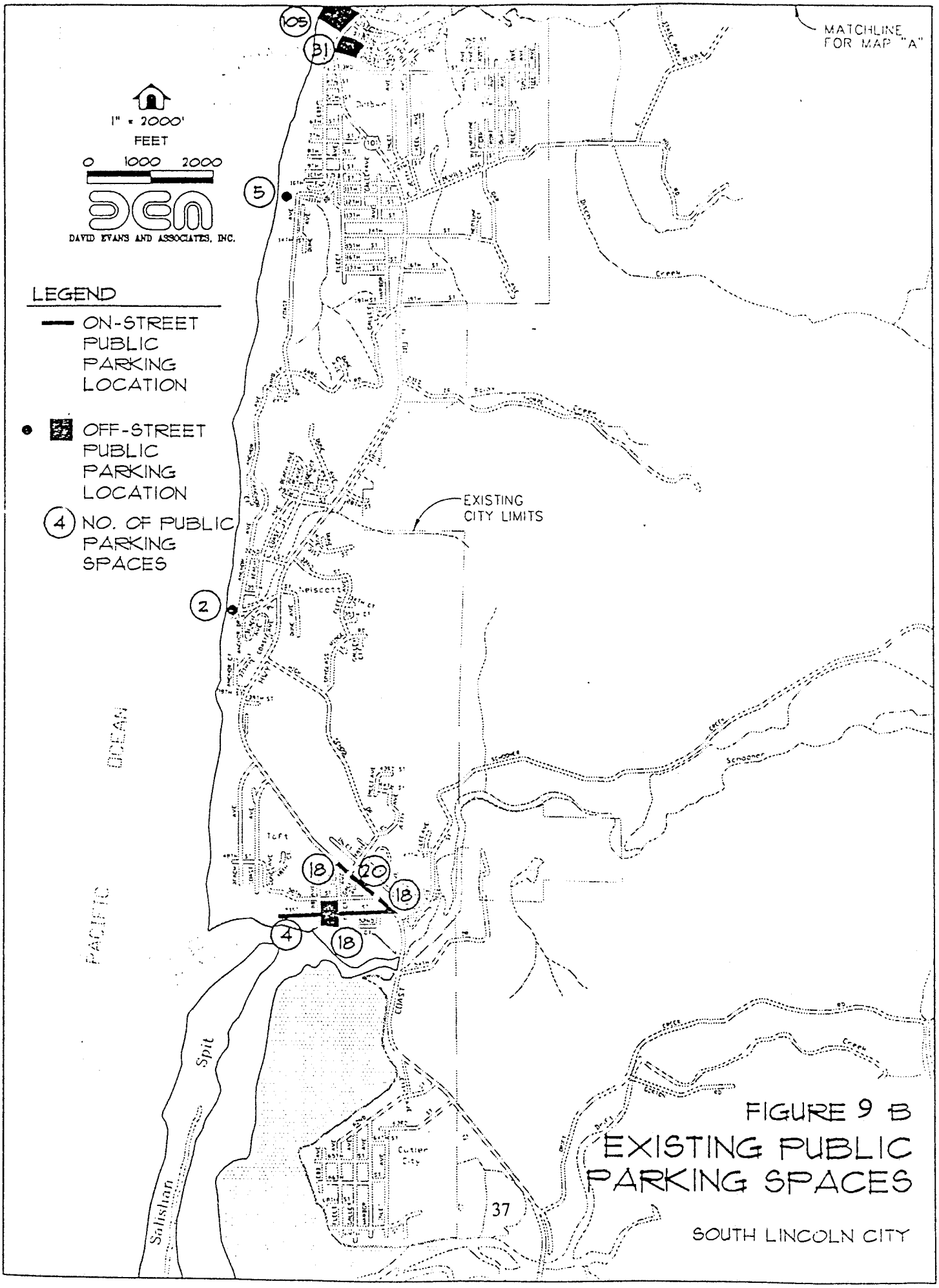


FIGURE 9 B

EXISTING PUBLIC PARKING SPACES

SOUTH LINCOLN CITY

TABLE 4
LINCOLN COUNTY COUNCIL ON AGING FLEET SPECIFICATIONS

Vehicle (car,van, bus)	Year	Capacity (# of seats)	Condition (good,fair,poor)	Lift-Equipped (yes, no)
Van	1983	14-passenger	fair	no
Van	1983	14-passenger	poor	no
Van	1986	14-passenger	poor	no
Van	1986	14-passenger	fair	yes
Van	1986	14-passenger	good	yes
Van	1992	14-passenger	good	yes
Van	1992	14-passenger	good	yes
Van	1992	14-passenger	good	yes

The existing lane configurations and type of traffic control for each study area intersection are shown in Figure 5.

TRAFFIC VOLUMES AND PEAK HOUR OPERATIONS

Existing weekend (Saturday) p.m. peak hour traffic volumes were obtained from previous traffic studies in the study area, ODOT or Lincoln County. This count data was supplemented through traffic counts completed by Kittelson and Associates on Saturday June 4, 1994. The traffic count data were factored to reflect traffic conditions expected on a average summertime Saturday. The existing 1994 traffic volumes are shown in Figure 6. Analysis of the traffic count data revealed that the peak hour volumes for design purposes occurs between 12:00 and 1:00 p.m. on a Saturday.

Current Levels of Service

All level-of-service (LOS) analyses described in this report were performed to comply with the requirements of ODOT. Signalized intersection LOS was determined using the SIGCAP analysis procedures. The minimum acceptable LOS criteria used in this study was LOS "C". A description of the LOS concept and the criteria by which LOS are determined are provided in Appendix A. For unsignalized intersections the UNSIG10 or equivalent method of analysis was used. The minimum acceptable LOS for unsignalized intersections is LOS"E" for the worst movement of the intersection. Copies of the analysis forms can be provided in a separate technical appendix to this report. To ensure that this analysis is based on worst-case conditions, the peak 15-minute period flow rate was used in the evaluation of all intersection levels of service.

Table 1 identifies the results of the LOS calculations for existing conditions at the study area intersections. As shown in the table, three unsignalized intersections have movements that are operating at LOS E during the p.m. peak hour on a peak Saturday. The intersections are U.S. Highway 101/N. 40th Street, U.S. Highway 101/N. Holmes Road and U.S. Highway 101/N. 17th Street. All the other intersections are projected to be operating at acceptable levels of service. However, it should be noted that the calculation of existing intersection level of service is based on traffic count data collected in the field. In some cases, the intersection is operating at an unacceptable level of service in the field, but the calculated level of service does not reflect this condition.

PLANNED/FUNDED TRANSPORTATION IMPROVEMENTS

Planned and funded short-term transportation improvements within the study area that are expected to influence existing and future traffic patterns include:

1. The installation of a traffic signal at the intersection of U.S. Highway 101 and N. 17th Street.
2. The removal of the traffic signal at the intersection of U.S. Highway 101 and N. 21st Street.
3. Limiting intersection turning movements to right-in and right-out at the U.S. Highway 101/N.W. 20th Street, U.S. Highway 101/N.W. 19th Street, U.S. Highway 101/N.E. 18th Place and U.S. Highway 101/N.W. 18th Street intersections.

<<<<<<<<<<<<<<<<<<<<<< C H A P T E R 3 >>>>>>>>>>>>>>>>>>>>>>

SHORT-TERM TRAFFIC SAFETY IMPROVEMENTS

Based on the assessment of existing conditions, and a review of recommended and implemented improvements (1981 Lincoln City Transportation Safety Study--Appendix A), some short-term traffic safety improvements have been identified for the Lincoln City street system. These improvements are warranted based on existing conditions, and should be programmed for implementation as soon as possible. Most of the identified short-term improvements are low-cost in nature, and could be achieved using agency (ODOT, City of Lincoln City, and Lincoln County) road maintenance forces.

SIGNALS

The major improvement needed in the signal system along Hwy 101 is the upgrade of the signal equipment. Several signal installations have deteriorated wooden poles, small (8") signal heads, and no vehicle detection capabilities. The existing signal interconnect system between N. 14th and N. 22nd Streets is not operating very well due to the lack of system detectors and less than optimum signal spacing.

Recommended signal improvements include installing new Model 170 signal controllers, new steel signal poles, and 12" vehicle signal heads. Also, recommend removal of the signal at N. 21st Street since the intersection is not well aligned, making left turns onto and off of Hwy 101 unsafe. N. 22nd Street can and should accommodate traffic needing to access Hwy 101 in that pattern.

Specific signal improvements are as follows:

Intersection Signal Modifications

- Hwy. 101/N. 22nd St. - install 12" signal head lenses, add vehicle detection;
- Hwy. 101/N. 21st St. - remove signal;
- Hwy 101/N. 14th St. - reconstruct signal, including steel poles, new controller, 12" signal heads and vehicle detection;
- Hwy 101/N. 6th Dr. - reconstruct signal, including steel poles, 12" signal heads, and vehicle detection;
- Hwy 101/S.E. 48th Pl. - install all 12" signal head lenses and vehicle detection;
- Hwy 101/S. 51st St. - reconstruct signal, including steel poles, new controller, 12" signal heads, and vehicle detection; and
- N.E. 14th St./N.E. Oar Ave. - replace red/yellow flashing beacon with all-red beacon.

New Signals

- Hwy 101/N. 17th St. - steel pole, 12" signal head, and

vehicle detection
Hwy 101/S. 62nd St. - all-red beacon

INTERSECTION LANE IMPROVEMENTS

Several intersections are in need of auxiliary lane improvements to facilitate existing traffic operations. These improvements include:

Hwy 101 (west side) south of N. 11th St - Consolidate driveway access;
Hwy 101 (west side) between S. 32nd and S. 35th Streets - reconfigure access to businesses;
Hwy 101 @ Inn at Spanish Head EAST parking lot access - Add NB accel/decel lane;
Hwy 101 (west side) between S.W. Fleet and S.W. Galley Avenues (Taft) - Install curbing to consolidate access;
Hwy 101 @ Siltez Bay Park - Add turn lane to enter and exit;
Police Department Access Road - Reconfigure access to U.S. Post Office from S.E. East Devils Lake Rd to Access Road.

ON-STREET PARKING REMOVAL

In order to utilize the roadway to its highest purpose, it is crucial that on-street parking be removed to gain needed travel lanes through the Oceanlake, Delake and Taft areas. As off-street parking facilities are identified and developed, proportional on-street parking in the general area should be removed.

Parking may be retained on the *west* side of Hwy 101 between N. 22nd and N. 21st Streets. There is more than adequate off-street parking adjacent to east-side businesses in that block.

PEDESTRIAN FACILITIES

Recommend "zebra striping" all Hwy 101 crosswalks, with **school** crosswalks in high-visibility yellow.

Recommend improved *advance* "School Crossing" warning signs at existing crossings on Hwy 101 at:

N. 28th St. - playground
N. 25th St. - playground
N. 22nd St. - (overhead and advance)
N. 21st St. - (overhead and advance)
S.E. 48th Pl. - (overhead and advance)

At unsignalized intersection approaches to Hwy 101--those approaches controlled by stop signs--vehicle stop bars should be installed. There are seven intersection approaches which need this treatment:

N.E. Holmes Rd approach to Hwy 101;
S.E. 9th St. approach to Hwy 101;
S.E. 19th St. and S.W. Bard Rd. approaches to Hwy 101;

S.W. 29th St. approach to Hwy 101;
S.W. 11th Dr. approach to S.W. Fleet Ave.;
N.W. Mast Pl. approach to N.W. 21st St.; and
N.W. Mast Pl. approach to N.W. 22nd St.

PAVEMENT MARKINGS

Inadequate and worn pavement markings on the city street system constitute a hindrance to public safety. There are numerous collector street segments which warrant but do not have centerline striping. There are other street sections which have either inappropriate centerline striping, or the striping has become illegible.

Those street segments where new/improved pavement markings are warranted are:

Add New Markings

Centerline striping on all arterials and major collectors.
Fog lines on West Devils Lake Rd from Hwy 101 (north end) to Holmes Rd; and from S.E. Oar Ave. to Hwy 101 (south end).
Fog lines on East Devils Lake Rd.

Modify Incorrect Markings

S.W. 51st St. (change yellow skipline to yellow centerline);
S.W. 12th St - S.W. Fleet Ave. to Hwy 101 (change white skipline to yellow skipline);
S.W. Beach Ave. - S.W. 48th St. to Hwy 101 (remove skip line); and
S.E. Inlet Ave. - north of S.E. 9th St. (change single yellow centerline to double centerline).

Pavement markings should be repainted on a regular basis.

SIGNING

There are several locations on the Lincoln City street system with inadequate or inappropriate traffic control signing. The Lincoln City Traffic Safety Committee has contributed to this list:

Standardize placement of "school crossing" warning signs at appropriate locations;
Add "Do Not Enter" signs on north park driveway off Regatta Park ingress road;
Add directional signs indicating W. Devils Lake Road at Hwy 101/N. 14th St. intersection;
Add curve warning signs on N.E. 22nd St. (east of N.E. Surf Ave.);
Add curve warning signs on N.E. 36th St. (west of W. Devils Lake Rd.)
Add stop sign on S.W. 11th Dr. (approach to S.W. Fleet Ave);
Add winding road curve sign on southbound W. Devils Lake Rd (north of N.E. 26th St.);

- # Add advance intersection warning signs on both both W. Devils Lake Rd. approaches to N.E. 22nd St.;
- # Add stop sign to S.W. Anchor Ct. approach to S.W. Anchor Ave;
- # Add stop sign to S.W. 35th St. approach to S.W. Anchor Ave.;
- # Add stop signs on S.W. 48th St. approaches to S.W. Coast Ave, and remove stop signs on S.W. Coast Ave. approaches to this intersection;
- # Add stop signs at S.W. Beach Ave/S.W. 48th St. intersection;

In general, the beach accesses in Lincoln City are inadequately signed from Hwy 101. The only beach guide signing currently is at the "D" River wayside and at N. 21st St. All designated beach access locations with parking facilities should have guide signing off Hwy 101. Possible locations include: S.W. 51st, S.W. 35th and S.W. 32nd Streets; and N.W. 15th, N.W. 21st, N.W. 26th, N.W. 36th and N.W. 40th Streets.

<<<<<<<<<<<<<<<<<<<<<< C H A P T E R 4 >>>>>>>>>>>>>>>>>>>>>>

TRAFFIC FORECASTS

To assess the need for and the impact of more extensive, longer-term highway improvements in the Lincoln City area, a traffic forecasting model was developed, and year 2015 traffic volumes projections generated. The model was based on an updated set of population and employment projections for the Lincoln City area, as well as some assumptions relative to the increase in future through-traffic volumes.

These projections and assumptions are based on unremarkable data. As this Master Plan is being written, an exceptional enterprise is underway: because of the Siletz Indian Gambling Casino and Convention Center anticipated in the north end of town, **all forecast and projection data used in this plan may be inaccurate.**

With that in mind, it is here recommended that actual on-site *traffic* and resident *population* counts be made biennially for the purpose of maintaining dependable data. Reviewing and evaluating data, and keeping this document dynamic and moving with the times is essential to the success of any planning effort.

POPULATION/EMPLOYMENT FORECASTS

The following describes and summarizes the methods and assumptions used to estimate the 1992 population/employment base and year 2015 population/employment forecasts for the city of Lincoln City study area.

Population

Base Population

Information for creating the 1992 base population was obtained from the 1990 Census through the Center for Population Research at Portland State University (PSU).

Census Bureau "Tiger" file maps for the Lincoln City area were obtained from PSU and the limits of the Urban Growth Boundary (UGB) and city boundary transferred to the maps. The maps were then returned to PSU where demographic information was extracted from their database for the Block Numerated Areas, Block Groups, and individual blocks contained (both partially and fully) within the UGB and city boundaries.

After the information was produced by PSU, an overlay of the Traffic Analysis Zone (TAZ) structure (see Fig.10) was applied to the tiger file maps, and the information for block groups and individual blocks was transferred to the corresponging TAZ and recorded on a "Lincoln City Population Data" spreadsheet (see Appendix D).

Seasonal vs. Resident Population

The TAZ spreadsheet prepared expresses figures for both year-round residents and peak population. The two populations are present in the TAZ spreadsheet to assist the traffic engineers in identifying high-traffic areas associated with the seasonal influx of visitors and part-time residents, and to provide more accurate assumptions when planning for public facility improvements.

Counts of year-round occupied and seasonally-vacant (or vacant) dwelling units were available for each Block Group in the Census information. The counts for each category of resident were transferred to corresponding TAZ's using the overlay method previously described. In addition to the number of seasonally vacant and vacant dwelling units in each TAZ, the number of overnight accomodations were also noted, enabling the peak population to be estimated.

The counts in the Census information also differentiated between single and multi-family dwelling units and mobile homes. For the purposes of this study, mobile homes were treated as single-family residences. Because this information was available, the total number of occupied dwelling units in each TAZ were further refined to express the number of single-family dwelling units and multi-family dwelling units. Single and multi-family dwelling units generally differ in their respective household size and thus trip generation.

The breakdown between single-family and multi-family dwelling units that are seasonally occupied was not provided for two reasons: First, the vast majority of seasonally vacant dwelling units are single-family structures. Second, these seasonally occupied structures vary drastically (over time periods) in average household size as compared with their year-round resident counterparts. Therefore, a breakdown of seasonal units would not provide useful information for the traffic modeling process.

Household Size

Several assumptions were made concerning average household size for *year-round residents* and average number of occupants in *seasonal or overnight accomodations*. Average household size for year-round single and multi-family units were estimated at 2.3 and 1.7 persons per household respectively.

The same 2.3 figure was used to estimate *peak* population associated with the periodic influx of seasoal residents and overnight guests. While the 2.3 figure is probably accurate for the number of persons in motel units, the number of people occupying a seasonal dwelling unit can vary widely. Several couples and/or families frequently occupy seasonal dwelling units that operate as vacation rentals. Therefore, because there is a lack of reliable information describing the average number of people occupying vacation rentals and seasonal dwelling units, **it is acknowledged that using the 2.3 figure undoubtably leads to significant inaccuracies in overall peak population estimates.**

Year 2015 Population

Population figures for each TAZ were projected to the year 2015. This forecast indicates that the resident population of the Lincoln City study will grow at an annual rate of 1.9% between 1992 and 2015. A slightly higher annual growth rate of 2.27% is expected for *peak* population during the same period.

Lincoln City's growth rate is expected to be greater than the state's growth rate as a whole. According to Bonneville Power Administration forecasts, Oregon is expected to grow at an annual rate of 1.40% for the next decade. Average growth rate for the state (Census Bureau statistics) was approximately 1.55% for the last two decades. According to the Census Bureau, historic annual growth rate for Lincoln City and Lincoln County for the last two decades average at 1.72% and 2.09% respectively. The decade of the '70s experienced fairly rapid growth, with rates for the City averaged at 2.68% and the County at 3.19%. The decade of the '80s was characterized by an economic recession and a slowing in the growth of the area. During the 1980s, both Lincoln City and Lincoln County grew by less than 1% annually.

The most densely-populated section along the Oregon Coast is in Lincoln County. **During the first two years of the '90s, Lincoln City's annual growth rate of 2.26% has far outpaced other communities in Lincoln County** (county-wide annual growth rate = 1.06%). With its improving economic outlook, Lincoln City has been favorably recognized nationally as a maturing retirement and resort community. Conditions in California and other states have prompted in-migrations of retirees to Oregon, some of whom have settled in the Lincoln City area.

In addition to the growth generated by this recognition, Lincoln City's proximity to the rapidly growing Portland and Salem metropolitan areas will generate significant demand for more second-homes, rental units and overnight accommodations. In fact, growth of the *peak population*--those numbers of seasonal and overnight visitors --is expected to exceed the growth rate for *full-time residents*.

Land developers have been quick to recognize the opportunities available in Lincoln City. Major resort developments, with substantial numbers of dwelling units, overnight accommodations and other attractions, are in the planning and development stages in the northern section of Lincoln City. Multiple family dwellings are planned for other areas throughout the city. The community recognizes that timely and adequate infrastructure planning to accommodate this growth is crucial to economic, environmental, and social well-being.

Employment

Base Employment

Major employers were identified and located on the TAZ map with assistance from the Lincoln City Comprehensive Plan, Lincoln City Planning and Community Development Department, State of Oregon Employment Division and individual phone contact with specific employers.

The employment base of Lincoln City is focused on retail trade and services to both permanent residents and visitors. According to Oregon Employment Division estimates, approximately 72% of Lincoln City's work force is involved in retail trade and services activities. Manufacturing and/or industrial-related employment is a very small segment of the employment base. According to the state, non-manufacturing employment accounts for approximately 95% of all jobs.

Retail trade and services are focused along the Hwy 101 corridor, creating a long commercial strip on either side of the highway. Because there are few concentrated areas of commercial activity (outside of the Oceanlake, Nelscott, Taft segments of the corridor), and because the majority of businesses along the highway are small, locating businesses in the proper TAZ was difficult.

Inventorying each and every small business along the highway was impractical, so estimates of the aggregate number (provided by the State for *retail trade*, *wholesale trade* and *services*) were apportioned to each TAZ abutting the highway. Where information on employment in retail trade, wholesale trade and services had been accounted for, an adjustment to the apportionment was made to avoid double counting of employees. Before the employment estimates were finalized, they were reviewed and revised by Lincoln City's Planning Director.

Year 2015 Employment

Retail trade and service-based employment is expected to remain as the major employer in Lincoln City. The small businesses focused along the highway are anticipated to be a strong component of Lincoln City's employment base. New jobs associated with resort projects and tourism-related facilities will provide more geographically focused employment opportunities in certain TAZ's.

Industrial and manufacturing-related employment will continue to be a smalll portion of the employment base, but may increase from approximately 3%--not to exceed 7%--of total employment in Lincoln City. The City Planning and Community Development department has recognized that Lincoln City needs additional industrial-related employment and has targeted areas in the city for planned industrial growth. Successful recruiting of individual industrial and manufacturing-related businesses to these sites will result in increased industrial-related employment--with the added benefit of higher then scale wage seasonal jobs.

Medical and hospital-related employment is expected to increase because 1) general increases in population generate a larger patient base and 2) retirees usually require more health services. Public service employment (city government school teachers, fire, police, etc.) will also increase in order to meet the rising demand for public service associated with the increase in population.

The Lincoln City study area "employment ratio" (a comparison between jobs and total population) is approximately 2.6 for 1992 and anticipated to be 2.5 for 2015. The *employment ratio* is an indirect indicator of a) unemployment levels, b) strength of the labor force and c) overall economic health. Cities in Oregon typically vary

between 2.1 and 2.9, with the smaller number indicating higher employment levels and a generally more dynamic economy. As seen from the year 2015, employment projections (refer to Appendix D), employment opportunities are expected to increase on a per capita basis during the next two decades for the study area. Many of these jobs will be service-oriented and directly related to the continued growth of the tourism industry in Lincoln City.

TRAFFIC FORECASTING METHODOLOGY

Traffic projections were developed using the TMODEL2 software package. This model has the capability of translating *projections* into *estimates* by Traffic Analysis Zone (TAZ), distributing the trafifc among zones, and assigning traffic to an identified street system. Further details on how the model goes through this process is described below.

Trip Generation

Vehicle trip generation estimates were made for each TAZ in the planning area on the basis of the type and quantity of residential dwellings and employees. Trip generation rates applied to these land uses were derived from the Institute of Transportation Engineers report: *"Trip Generation"*, (Fifth Edition, 1991). These rates were modified to reflect generalized land use categories for planning purposes on the basis of experience in other cities in Oregon of similar size, and through the travel model calibration process (See Table 5).

The trip generation from seasonal dwelling units was assumed to be identical to that from single-family dwelling units since most of them are single-family dwelling units. The traffic conditions were modeled for the peak summer month when most of these units would be occupied.

These trip rates were refined into four trip purposes for the PM peak hour as follows: home-based work, home-based shopping, home-based other, and non-home based. The amount of traffic generated at each TAZ was estimated for the PM peak hour by multiplying the number of dwellings (or employees) by the appropriate origin and destination trip generation rate by trip purpose.

Trip Distribution

The vehicle trips estimated to be generated at each zone were in terms of trip *origins* and trip *destinations* during the PM peak hour. The trip origins were then distributed to all of the trip destinations within the planning area and to the roads leading out of the study area. The total (origins and destinations) were also estimated at the external stations for the roads leading into Lincoln City.

The trip distribution was based on a conventional gravit model which distibutes trips from one zone to all other zones--in direct relationship to the size of the destinations in each zone and in inverse relationship to the travel time between the zones. This

procedure was followed for trips originating in all 60 internal zones and at the external stations for all of the roads leading into Lincoln City.

To aid in developing the trip distribution model, a telephone interview of 200 residents in the city was made to determine where people generally work and shop. The results of this survey were provided separately to the City, and are partially contained in Table E-1 and E2 in Appendix E. They are summarized below:

- 74 % of the resident labor force work in Lincoln City;
- 26 % of the resident labor force work in other cities;
- 97 % of all convenience shopping by residents is done in Lincoln City; and,
- 59 % of the comparison shopping by residents is done in Lincoln City.

It is estimated that the sampling error of this survey is less than 10 % with a confidence level of 95 %. In other words, we can be 95 % certain that the survey results are within 90 % of the results that would have been obtained if every household in the city had been surveyed.

Trip Assignment

This procedure utilized a capacity restraint microcomputer model which assigns traffic in increments to the street system and then compares each incremental assignment with the *street capacity* to determine the fastest route. The result of this procedure is to simulate "real world" motorists' choices on a travel route. It does not take into account that for through-traffic in Lincoln City, there is only one north/south travel route--Hwy 101.

Through-traffic data was obtained through an origin/destination study done by ODOT in LIncoln City in November of 1990. That study revealed that approximately 28 % of the (external) traffic along Hwy 101 is through-traffic. The remaining 72 % (external) traffic has one trip end outside and one trip end inside Lincoln City.

YEAR 2015 NO-BUILD CONDITIONS

ODOT has two permanent recorder station in the vicinity of Lincoln City. One recorder station is located south of Lincoln City on Hwy 101, 3.6 miles north of Newport. It indicates a 4.2 % exponential traffic growth rate on Hwy 101 from 1970 to 1980, and a 3 % rate from 1980 to 1990. The other recorder station is located east of Lincoln City on Hwy 18, 0.7 miles east of Valley Junction. It indicates a 2.6 % (exponential) traffic growth rate on Hwy 101 from 1970 to 1980, and a 2 % rate from 1980 to 1990.

Household growth in Lincoln City is projected at 68 % from 1992 to 2015, which translates into a 2.3 % annual (exponential) growth rate during the 23 year period. Also, employment is projected to grow 66 % from 1992 to 2015, translating into an annual 2.2 % growth rate.

Based on the historical 20-year traffic growth at the two permanent traffic recorder stations and the estimated population and employment growth in the 23-year forecast period, the external traffic (having at least one trip end outside Lincoln City) was estimated to grow annually by 66% from 1992 to 2015. Both the exteral-external (with both trip ends outside Lincoln City) and the external-internal/ internal-external (with one trip end inside and the other trip end outside Lincoln City) trips were forecast to grow by 66% from 1992 to 2015.

The increase in trip origins and destinations at traffic zones inside Lincoln City was defined by the estimated increase in population and employment in Lincoln City from 1992 and 2015. This was then balanced against the forecast growth in external-internal/internal-external trips for the various trip types.

The 2015 traffic was first assigned to the existing major street system to determine which portions of the system would be deficient within the next twenty years. The following chapter (Roadway System Alternatives) compares the forecast traffic volumes on the existing system and three different alternatives.

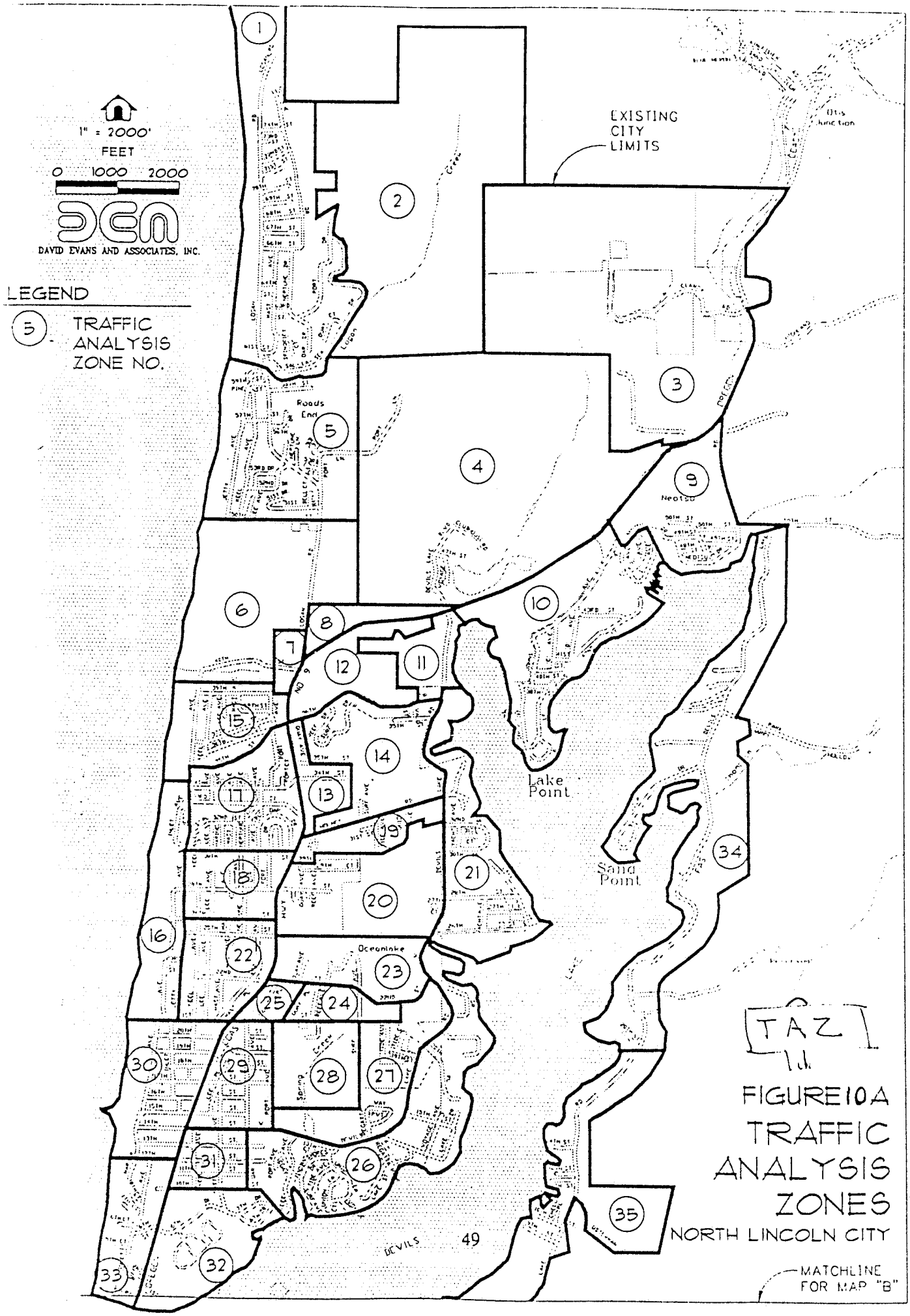


FIGURE 10A
TRAFFIC ANALYSIS ZONES
NORTH LINCOLN CITY

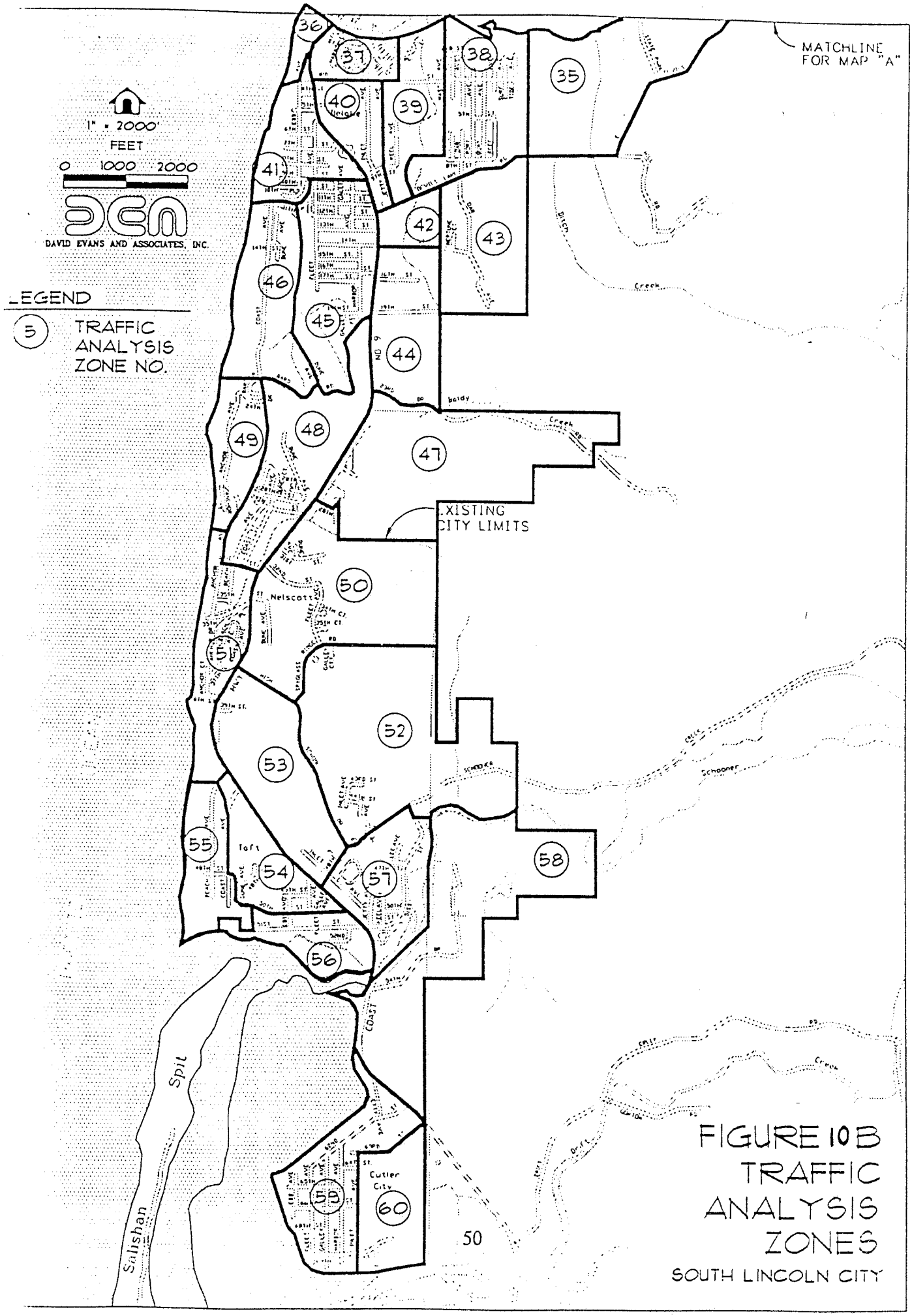


FIGURE 10B
TRAFFIC ANALYSIS ZONES
SOUTH LINCOLN CITY

<<<<<<<<<<<<<<<<<<<<<<<< C H A P T E R 5 >>>>>>>>>>>>>>>>>>>>>>>>

ROADWAY SYSTEM ALTERNATIVES

INTRODUCTION

As previously indicated, existing Hwy 101 will not have the capacity to accomodate future volumes of traffic caused by the anticipated growth in population and employment in Lincoln City.

In fact, "capacity deficiencies" on Hwy 101 occur even now during the extended tourist season, causing serious congestion and inducing traffic to divert to the local street system. These capacity deficiencies are known unofficially as "bottlenecks". Basically there are two methods for dealing with bottlenecks: 1) *eliminate them*--widen the roadway to efficiently accommodate higher volumes of traffic, or 2) *go around them*--reduce the volume of traffic on the constricted roadway by providing additional capacity--with an **alternate** highway. This Master Plan examines both alternatives along with other modifications.

Lincoln City's bottlenecks are primarily: 1) the 2-lane section in the north end of town--from Hwy 18 to N. 26th St.; 2) the 4 travel lane section of Hwy 101 through downtown Oceanlake (with 2 on-street parking lanes sometimes present) where a car waiting in a travel lane to turn left causes the traffic in that lane to stack up behind it; 3) the section of roadway through the city with 2 and 3 lane sections (mostly with no parking lanes); and, 4) the 2-lane Schooner Creek Bridge.

In the downtown Oceanlake area where on-street parking has already been removed and the space redistributed to effect 2 travel lanes in each direction with a center left-turn lane, it is obvious that--without an obstruction in a **travel** lane--traffic flows freely.

A sensitivity analysis of Transportation Demand Management (TDM) on Hwy 101--a technique which spreads travel demands to different time periods to reduce congestion--was made to determine if these measures would reduce the need for increasing roadway capacity. This analysis focuses on the home-to-work trips. Table 6 at the end of this chapter compares the journey-to-work data for 1990 with the results of this sensitivity analysis on vehicle trip reduction for 2015.

The effect of TDM proved to have a maximum reduction effect of only 2.8 % of the peak hour trips--or 300 vehicle trips at the PM peak hour--by the year 2015. Since the PM peak hour projections are 1,400 to 1,800 vehicles, and since **the capacity of one *additional* roadway travel lane would carry more than 500 vehicles per hour**, it is not expected that a TDM program would eliminate the need for additional future roadway capacity.

ALTERNATIVES

Four alternatives were developed and examined to meet the future increase in volumes of traffic and the City's goals. These

alternatives were reviewed with the Transportation Advisory Committee for the master planning effort so that conclusions could be reached on which alternative should be identified as the Lincoln City Transportation Master Plan. The alternatives were:

- No Build - Assumes no changes to the existing street system except committed improvements on the local street system and those associated with new developments..

- Alternative 1 - Completing the widening of Hwy 101 to 2 through-lanes in each direction, with a center left-turn lane where necessary, from the north to the south city limits.

- Alternative 2 - Construction of an alternate roadway (a bypass) on the east side of Devils Lake.

- Alternative 3 - Completing the widening of Hwy 101 as outlined in Alternative 1 PLUS the construction of an east side bypass.

Figure 11 shows the approximate location of the alternatives. For each alternative evaluated in detail, year 2015 PM peak hour traffic projections for the peak summer period were developed. (See Figs 12 and 13) These projections did not include the effect of a TDM program.

A traffic operations analysis was then conducted at the major intersections in the city to compare the Level Of Service (LOS = "stand time") at these locations with each roadway system alternative. This was an important analysis, given that the LOS in an urban area such as Lincoln City is largely influenced by intersection operations, particularly *signalized* intersections. Table 7 summarizes this analysis.

As stated in the 1991 Oregon Highway Plan, **statewide** highways in urban areas require an operating LOS standard of "C". The *minimum tolerable* condition for **statewide** highways is LOS "D". Highways with a *lower* Level of Importance (such as **Regional** or **District** Highways) would be expected to have lower Levels of Service standards. Levels of Service (LOS) standards are State designations; city streets have flexible standards imposed by local needs.

Some intersections in Lincoln City are presently at state LOS "D" during peak hours and, on certain off-season weekend peak hours, with LOS of "E" at certain major intersections. Attaining *acceptable* state LOS standards might require certain traffic management techniques.

ODOT's Access Management Policies (containing techniques for roadway management) have been placed in Appendix X as an informational resource only. They are categorically disallowed as blanket policy, and will not become a part of the city's Comprehensive Plan by reference. Certain techniques from this section may be tested and implemented in an effort to improve the use of the roadway, but each will be subject to council approval and the public hearings process *on a case by case basis.*

Table 8 provides a system comparison of the Hwy 101 Widening Alternative and the No-build Alternative, using the 2015 traffic projections and the following criteria:

- # Traffic diversion off Hwy 101;
- # Miles of congested road segments (PM peak hour LOS = E or F)
- # Vehicle miles of travel (PM peak hour);
- # Vehicle hours of travel (PM peak hour);
- # Removal of on-street parking along Hwy 101;
- # Social/environmental impacts; and
- # Compatibility with state planning goals.

Detailed description and evaluation of each of the three alternatives follows.

ALTERNATIVE 1 - WIDENING OF HIGHWAY 101 TO 4-5 LANES

With this alternative, the existing highway would be widened to a 4-5 lane facility in those sections that are currently 2-3 lanes. *The objective is to provide two through-lanes in each direction throughout the city, with center left turn lanes where necessary.*

To facilitate the success of this alternative, bicycle lanes would be removed from most segments of Hwy 101 by routing them to other roadways through and around the city. This is a significant step. By removing the requirement for 5-foot bike lanes from this primary city arterial, the 4-laning of the bottleneck at Spanish Head might be accomplished at minimal cost. Several bike routes are presently in use in the city.

Currently about 3.5 miles of Hwy 101 through the city have only 2-3 traffic lanes. These sections include:

- # East Devils Lake Road (north end) to N. 26th St.;
- # S. 19th St. to S.W. Beach (4200 block of Hwy 101); and
- # S. 52nd Court to Drift Creek Rd.

In developing the highway traffic projections for the Widening Alternative, the traffic model assumptions require some level of traffic-control (access) strategy, but as stated above, in this Plan each strategy will be imposed on a case-by-case basis.

Table 7 shows the year 2015 PM projected peak hour traffic impacts of the **"Widening Alternative"** on the Lincoln City street system, for the peak summer period only. When compared to the **"No-build"** condition, there would be less diversion of traffic to the local street system and generally more traffic on existing Hwy 101.

Assuming that peak hour traffic in 2015 is 10% of daily traffic, traffic volumes on Hwy 101 would range from about 28,000 vehicles a day in Cutler City and about 40,000 vehicles a day near the "D" River bridge.

The **"Widening Alternative"** would result in less traffic on the ocean-front collector streets and West and East Devils Lake Roads when

compared to the **"No-build"** condition. Overall, PM peak hour vehicle hours of travel would be about 70% less than with the no-build condition. Vehicle miles of travel would be slightly higher because the added roadway capacity would facilitate trip-making, when compared to the no-build condition.

When the peak hour traffic projections are compared to the assumed roadway link capacities in the model, no *segment* of the street system is identified to be at overcapacity. However, when looking at LOS more closely, at major *intersections* along the highway,there appear to be several locations where poor levels of service ("E") would be experienced during the 2015 PM peak hours. These locations are: N.W. Logan Road, N. 22nd St., and S.E. East Devils Lake Road. The Kittelson Report (noted earlier) also lists LOS "E" at: N. 40th St., Holmes Rd., and N. 17th St.

With the Widening Alternative, a minimum of 183 on-street parallel parking spaces would be eliminated.

Understandably, the Oregon Transportation Plan (OTP) contains Corridor-wide policies requiring certain standards and design features for overall Corridor consistency. The costs of improving Hwy 101 through Lincoln City, using the requirements of the OTP (especially those addressing Level of Service standards, Access Management, and other features--such as relocation of utilities, barrier controls, islands and medians, etc.), would certainly exceed those of the simple widening and traffic management guidelines on a city street envisioned here in Lincoln City's Master Plan.

Lincoln City's Transportation Master Plan assumes the widening of Hwy 101 from city limit to city limit, with the exception of the High School Dr. to Beach Ave. section which would be 4-lane (around the Spanish Head section). The widening of the 2-lane Schooner Creek Bridge (under a Federal Bridge grant) is called for.

Under the above premise, the cost of widening Hwy 101 as Lincoln City's "Main Street"--*without the complex features of a Scenic Byway*--would undoubtably be significantly lower than the spectacular Scenic Corridor . Although any construction project would have severe economic and social impacts to the city, this alternative--the simple widening of Hwy 101 to 4-5 lanes--would be far less disruptive than the Scenic Byway project, and appears to have the strongest prospect of endorsement by the community.

ALTERNATIVE 2 - EAST SIDE ALTERNATE HIGHWAY (BYPASS)

This conceptual alternative calls for an approximately 7.2 mile roadway which would bypass the city. It would be constructed on an alignment east of Devils Lake. It would connect to existing Hwy 101 at the north end, and again at the south end.

Current federal law requires that vehicle volumes be reduced in urban areas. An east-side Alternate roadway (a bypass) would fulfill that requirement by reducing the increasing volumes of through-traffic which currently bring negative impacts to the community.

In the early 1970s, an alignment for a Lincoln City bypass had been identified by ODOT and the public hearings process completed when a group of influential local businessmen, fearing the loss of business, pressured the state to drop the project. The need for an alternate roadway continued to intensify, and the City has continued to request that the bypass project be placed on the state's Transportation Improvement Program (Six-Year Plan/STIP).

Traffic projections for the year 2015 PM peak hour for the Alternate Roadway (Bypass) Alternative. Assuming a 10% ^ peak hour percentage of daily traffic, the bypass would attract 11,000-12,000 vehicles a day in 2015. There would still be substantial traffic volumes on an unimproved Hwy 101, ranging from about 20,000 vehicles a day through the Taft District to 30,000 vehicles a day near the "D" River Bridge.

When the peak hour traffic projections are compared to the assumed roadway link capacities (*in the model*), no **segment** of the street system is identified at overcapacity. However, there are several **intesections** along Hwy 101 where poor levels of service would be experienced during the 2015 PM peak hours--chiefly the north and south East Devils Lake Road intersections, which would experience LOS of "E".

Obviously the Eastside Alternate Highway/Bypass Alternative would not reduce the volumes of vehicles entering the city specifically to access the gambling casino attraction in the north end. However, by taking through-traffic vehicles, Scenic Byway visitors, and commercial traffic **around** the city, the Bypass Alternative would substantially mitigate Lincoln City's intensifying in-town traffic problems.

This Alternative would be expected to have greater environmental impacts in the area than Widening Hwy 101 (Alternative 1) because it might traverse forest and farm lands, and because there are wetlands in the direct path of its southern terminus.

The cost of constructing the Eastside Alternate Highway in 1994 dollars is unknown. The David Evans estimate of "around $40 million in 1992 dollars" was derived by factoring the 1974 costs for a bypass along the Rock Creek Corridor, and included costs of the extension of S.E. East Devils Lake Road to access the Alternate Highway and intersection improvements at three access locations. No mid-town access is called for in this Plan.

Since the probable alignment for the bypass would be mostly (if not totally) outside of the Urban Growth Boundary (UGB), the State's Transportation Planning Rule (OAR 660-12) would *require exceptions to one or more Statewide Planning Goals*. Therefore, although this alternative was studied, and although traffic volume projections would justify it, the request for an Eastside Alternate Highway/Bypass in this Master Plan appears to be inappropriate at this time.

ALTERNATIVE 3 - WIDENING HWY 101 TO 4-5 LANES *PLUS* EAST SIDE BYPASS

According to projections, this alternative appears to provide excess capacity to handle traffic for the year 2015 and beyond. It also results in the best level of service at major intersections along

existing Hwy 101 of any of the alternatives (with acceptable operations also experienced at the bypass access locations).

From a cost standpoint, this alternative would, of course, be the most expensive, with the cost of both projects (the bypass and the widening of Hwy 101) estimated to be around $70 million (in 1992 dollars).

The environmental and social impacts mentioned in Alternatives 1 and 2, when taken together for this maximum road development scenario, would be the greatest of any one of the alternatives alone.

CONCLUSION

It is concluded that the Widening Alternative *(four travel lanes plus left-turn lanes where necessary, removing all "bottlenecks", removing on-street parking in most locations, and relocating bicycle lanes)* will provide sufficient roadway capacity and will best serve the community well into the next century. **Alternative 1, Widening of Hwy 101 to 4 to 5 Lanes, is the chosen alternative of this Master Plan.**

Modifications of principal intersections along Hwy 101 will also be necessary in order to maintain level of service (LOS) D or minimum tolerable conditions. These intersections are:

- The north connection of East Devils Lake Road
- Logan Road
- N. 40th Street
- Holmes Road
- N. 17th Street
- The south connection of East Devils Lake Road/S. 12th.

It is hoped that the state will recognize the need for routing through-traffic around Lincoln City and will identify an eastside highwway alignment which would add critically-needed roadway capacity to the coastal highway system.

TABLE 6
POSSIBLE AFFECT OF TRANSPORTATION DEMAND MANAGEMENT
Reduction 2015 to Peak Hour Vehicle Trips

	Percent of Work Force			*PM Peak Hour Vehicle Trip Reductions*
	1980	*1990*	*2011*	
Drive Alone		64.8%	48.2%	**
Carpool		14.4	17.0	50
Transit		0.2	1.2	15
Bicycle		1.3	2.6	20
Walk		10.7	15.0	65
Other		1.0	1.0	0
Work at Home		7.6	15.0	110
Alt. Work Schedules				40
TOTAL				300

** Reduction included with effect of carpool

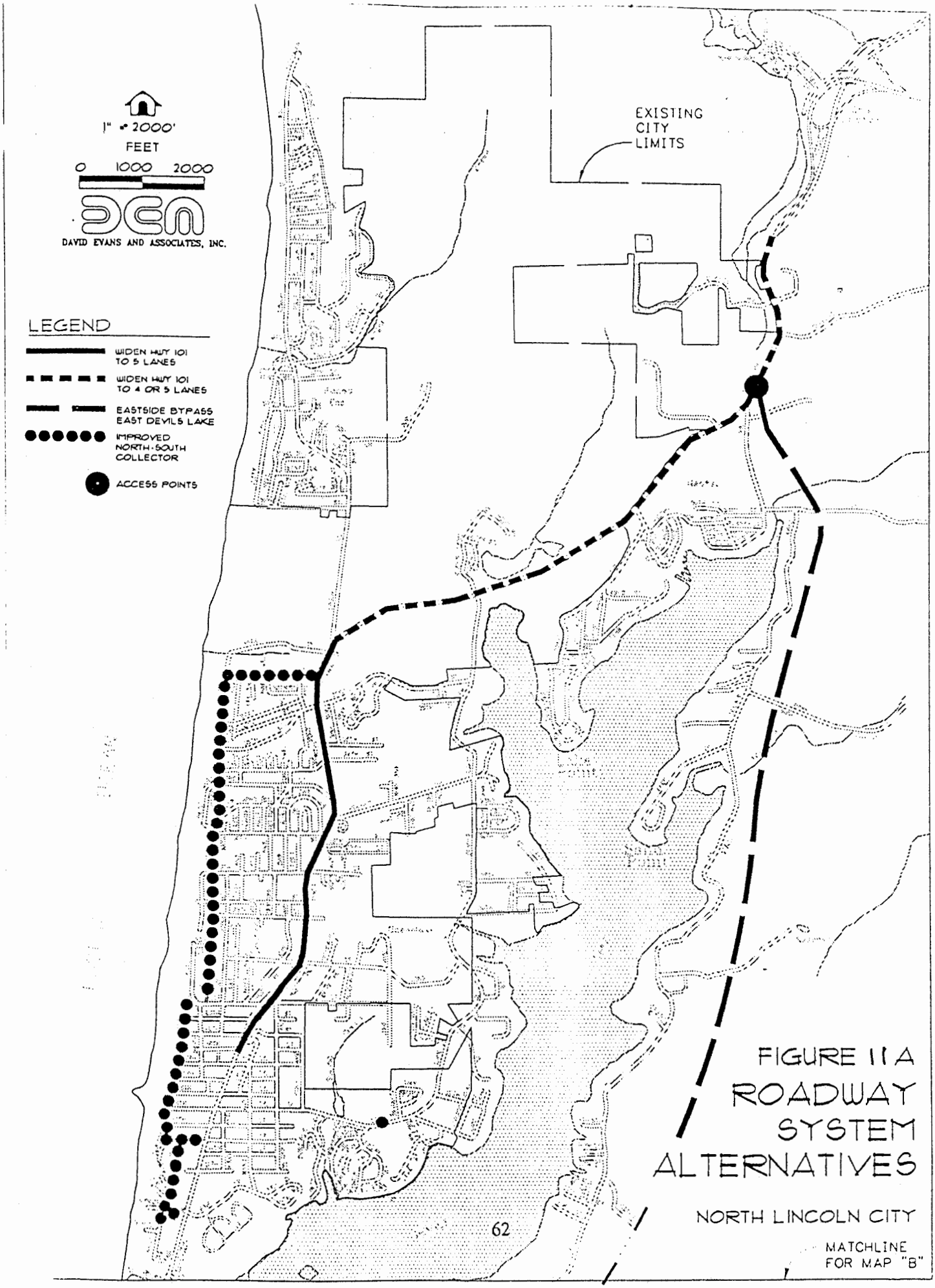


FIGURE 11A

ROADWAY SYSTEM ALTERNATIVES

NORTH LINCOLN CITY

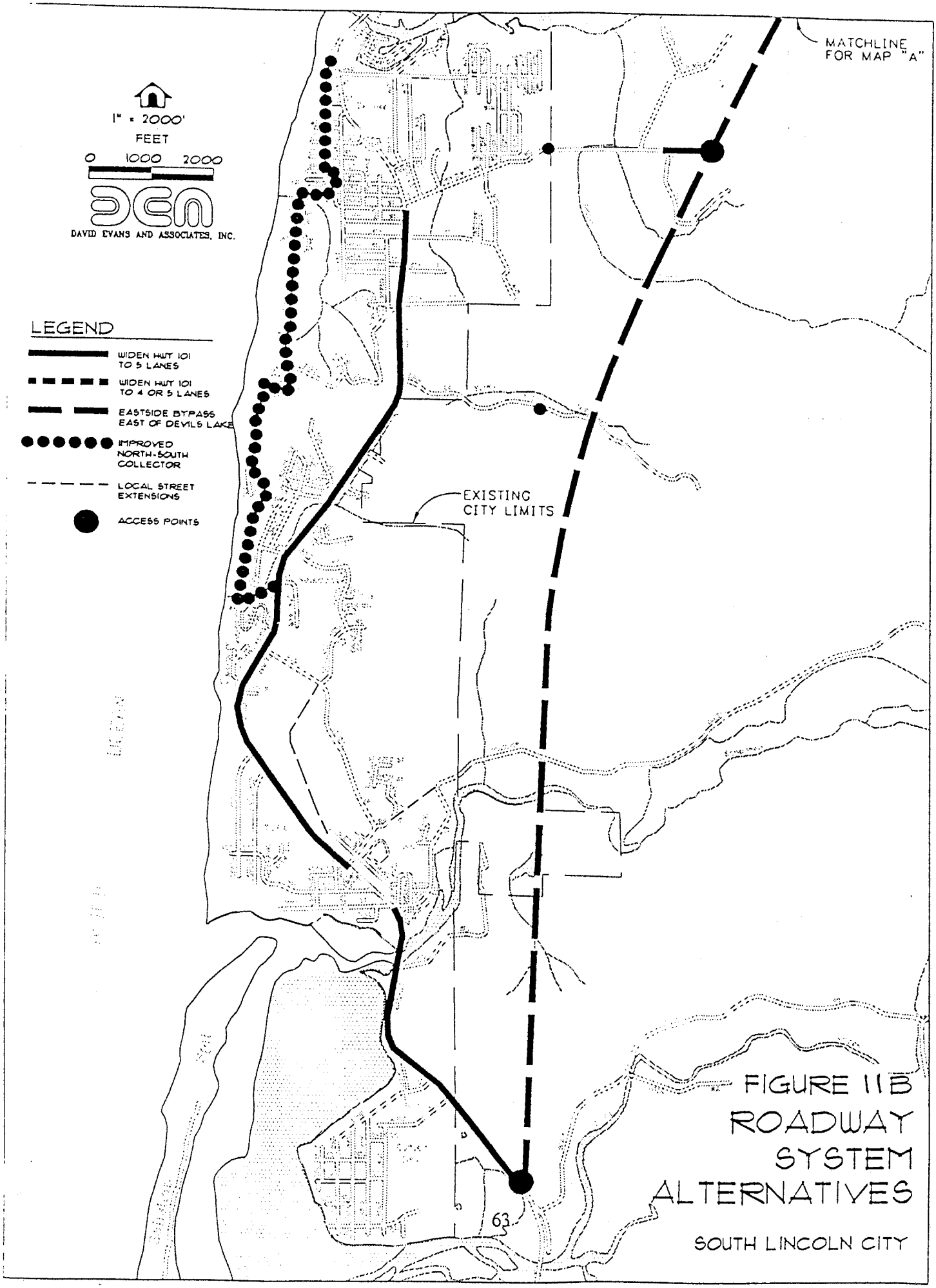


FIGURE 11B
ROADWAY SYSTEM ALTERNATIVES
SOUTH LINCOLN CITY

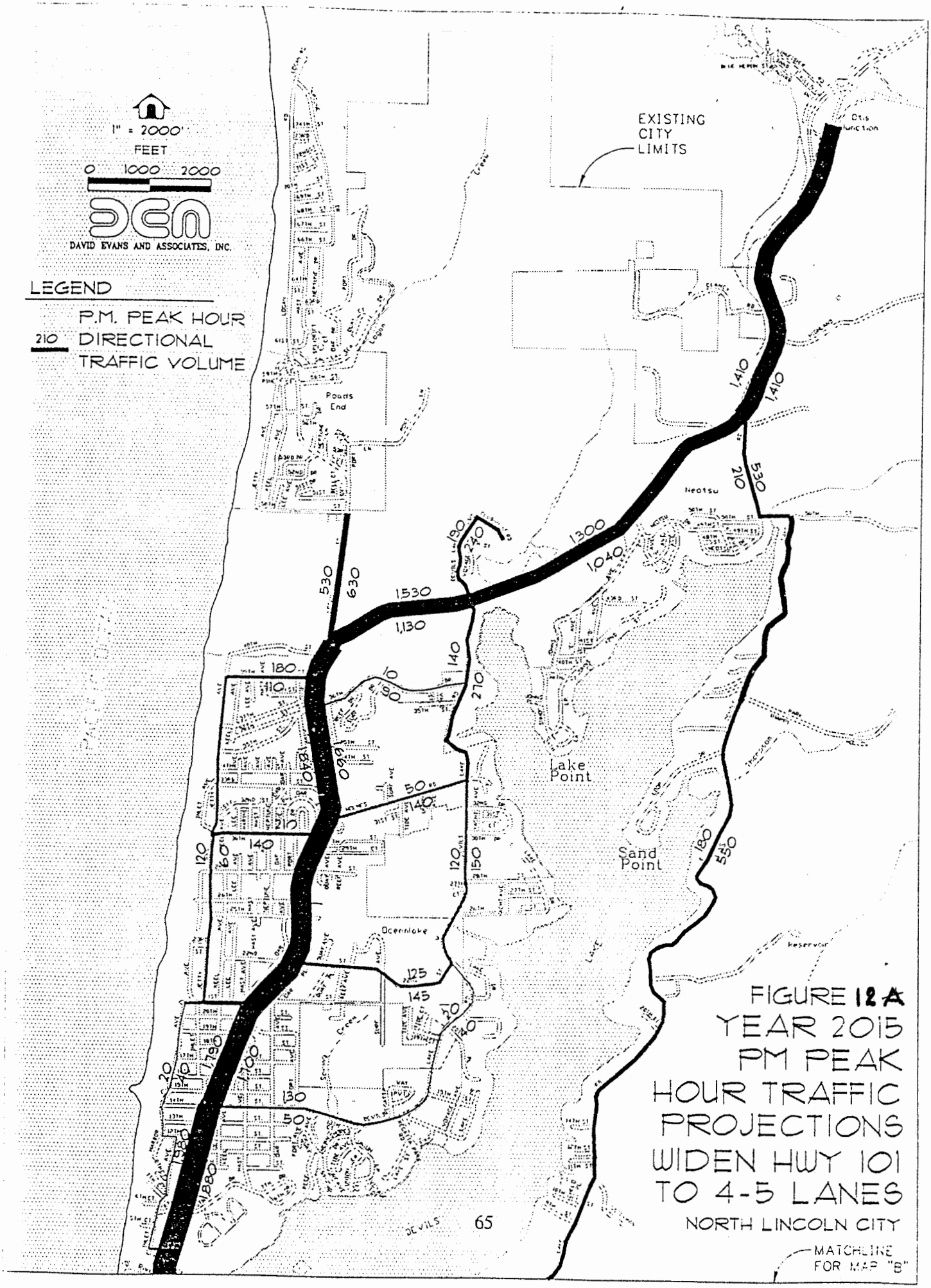


FIGURE 12A
YEAR 2015
PM PEAK
HOUR TRAFFIC
PROJECTIONS
WIDEN HWY 101
TO 4-5 LANES
NORTH LINCOLN CITY

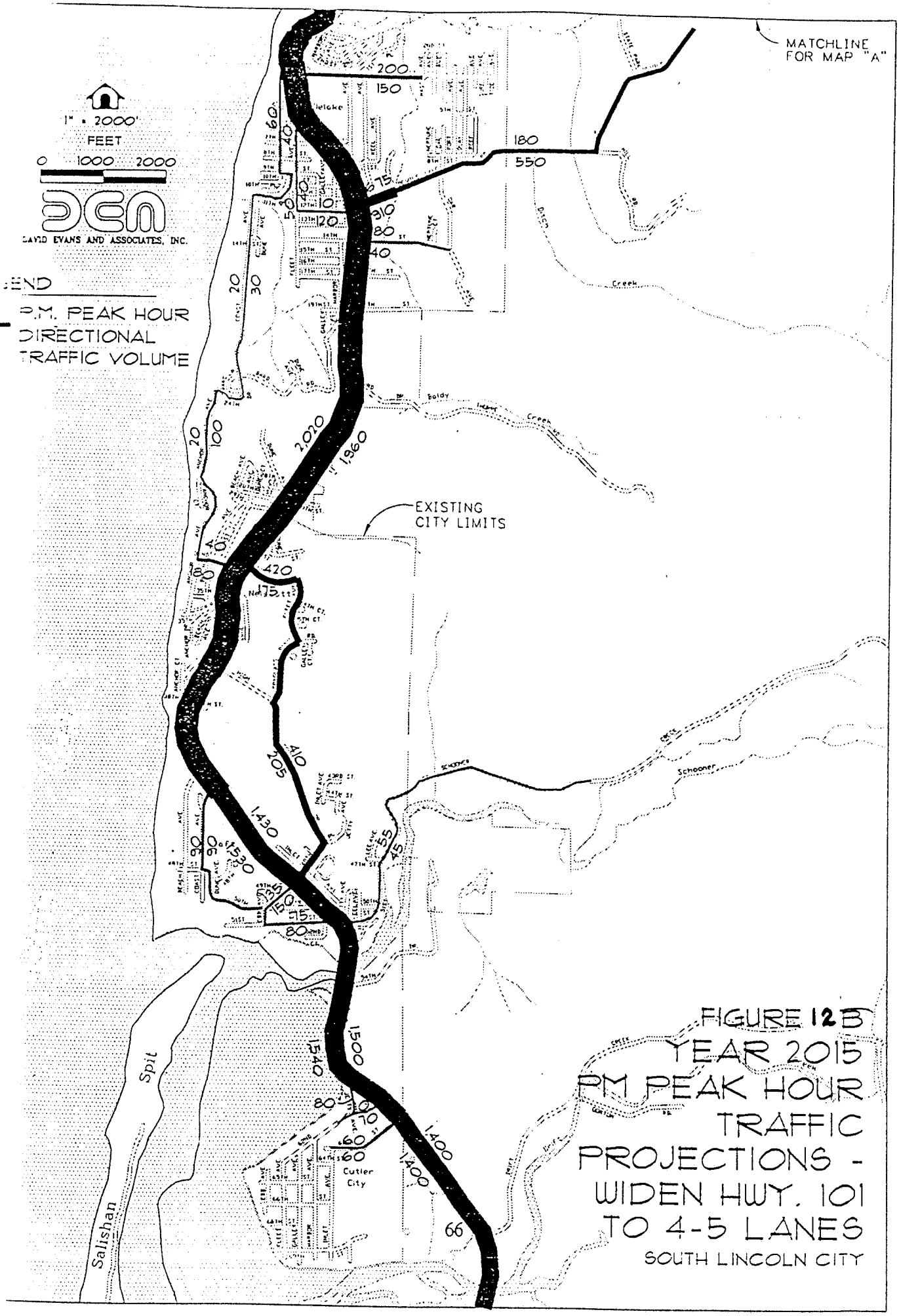


FIGURE 12B
YEAR 2015
PM PEAK HOUR
TRAFFIC
PROJECTIONS -
WIDEN HWY. 101
TO 4-5 LANES
SOUTH LINCOLN CITY

TABLE 7
YEAR 2015 SUMMER WEEKDAY PM PEAK HOUR
INTERSECTION LEVELS OF SERVICES -
COMPARISON OF ROADWAY ALTERNATIVES

Intersection	Roadway System Alternatives				
	No-Build	Five-lane US 101	Eastside Bypass	Westside Bypass	Five-lane US 101 + Eastside Bypass
US 101 and East Devils Lake Road (North End)	1.18 F	0.85 D-E (1)	0.89 E (2)		0.73 C-D
US 101 and West Devils Lake Road (North End)	0.94 E	0.64 C	0.81 D		0.59 B
US 101 and Logan Road	0.73 C-D	0.88 E (4)	0.68 C		0.75 D
US 101 and N. 40th Street	0.91 E	1.02 F (5)	0.83 D		0.91 E (6)
US 1010 and N. 22nd Street	0.74D	0.80 D	0.69 C		0.76 D
US 1010 and N. 21st Street	0.69 C	0.70 C-D	0.68 C	Dropped	0.69 C
US 101 and N. 14th Street/West Devils Lake Road (South End)	0.73 C-D	0.70 C-D	0.71 C-D		0.61 C
US 101 and S. 1st Street/Beach Access	0.75 D	0.80 D	0.70 C-D		0.67 C
US 101 and S. 12th Street/East Devils Lake Road (South End)	1.29 F	1.18 F (7)	0.92 E (8)		0.86 D-E (9)
US 101 and S. 51st Street	0.67 C	0.67 C	0.63 C		0.56 B
US 101 and S. 40th Street/High School Drive	0.99 E-F	0.74 D	0.65 C		0.63 C

Notes:

1. 0.66 C with two-lane (shared left-through and right-turn lanes) East Devils Lake Road approach.
2. 0.80 D with additional southbound left-turn lane on US 101.
3. 0.84 D-E with additional southbound left-turn lane on US 101, and two-lane (shared left-right and right-turn lanes) East Devils Lake Road approach.
4. 0.83 D with three lanes (left-, through-, and right turn lanes) at Logan Road approach.
5. 0.85 D-E with two-lanes (shared left-through and right-turn lanes) at N. 40th Street approach.
6. 0.73 C-D with two-lanes (shared left-through and right-turn lanes) at N. 40th Street approach.
7. 0.93 E with additional right-turn lane at northbound US 101 approach; shared through-right and left-turn lanes at eastbound and westbound approaches; and overlap signal phasing for east-west phasing - may require geometric improvements to align east and west approaches.
8. 0.81 D with additional right-turn lane at northbound US 101 approach; shared through-right and left-turn lanes at eastbound and westbound approaches; and overlap signal phasing for east-west phasing - may require geometric improvements to align east and west approaches.
9. 0.83 D with additional right-turn lane at northbound US 1010 approach.

TABLE 7
YEAR 2015 SUMMER WEEKDAY PM PEAK HOUR
INTERSECTION LEVELS OF SERVICES -
COMPARISON OF ROADWAY ALTERNATIVES

(Continued)

Intersection	Roadway System Alternatives				
	No-Build	Five-lane US 101	Eastside Bypass	Westside Bypass	Five-lane US 101 + Eastside Bypass
US 101 and Eastside Bypass (North End)	N/A	N/A	1.19 F (10)	Dropped	1.12 F (11)
US 101 and Eastside Bypass (South End)	N/A	N/A	0.91 E (12)		0.86 D-E (13)
US 101 and Westside Parkway (North End)	N/A	N/A	N/A		N/A
Westside Parkway and Holmes Road	N/A	N/A	N/A		N/A
Westside Parkway and West Devils Lake Road	N/A	N/A	N/A		N/A
Westside Parkway and East Devils Lake Road	N/A	N/A	N/A		N/A
US 101 and Westside Parkway (South End)	N/A	N/A	N/A		N/A

Notes:

10. 0.90 E with two lanes (through- and left-turn lanes) at southbound US 101 approach; and three lanes (one left and two right-turn lanes) at bypass approach.
11. 1.01 E-F with two lanes (through- and right-turn lanes) at northbound US 101 approach; three lanes (one through- and two left-turn lanes) at southbound US 101 approach; and two lanes (right- and left-turn lanes) at bypass approach.
12. 0.82 D with two lanes (through- and left-turn lanes) at southbound US 101 approach; two lanes (through- and right-turn lanes) at northbound US 101 approach; and two lanes (shared left-right and right-turn lanes) at bypass approach.
13. 0.78 D with two lanes (through- and left-turn lanes) at southbound US 101 approach; two lanes (through- and right-turn lanes) at northbound US 101 approach; and three lanes (one shared left-right and two left-turn lanes) at bypass approach.
14. 0.75 D with two lanes (through- and right-turn lanes) at northbound US 101 approach; three lanes (one through- and two left-turn lanes) at southbound US 101 approach; and three lanes (one left-turn and two right-turn lanes) at parkway approach.
15. 0.97 E with three lanes (left-, through-, and right-turn lanes) at northbound parkway approach; and two lanes (left-turn and shared right-through lanes) at all three remaining approaches.
16. 0.95 E with three lanes (left-, through-, and right-turn lanes) at both parkway approaches; and two lanes (left-turn and shared right-through lanes) at West Devils Lake Road approaches.
17. 1.07 F with three lanes (left-, through-, and right-turn lanes) at southbound parkway and eastbound East Devils Lake Road approaches; and two lanes (left-turn and shared right-through lanes) at northbound parkway and westbound East Devils Lake Road approaches.
18. With two lanes (shared left-right and left-turn lanes) at parkway approach.

TABLE 8
EVALUATION OF ROADWAY SYSTEM ALTERNATIVES

EVALUATION CRITERION	ROADWAY SYSTEM ALTERNATIVE			
	No-Build	5-Lane U.S. 101	East Bypass	5-Lane U.S. 101 and East Bypass
Traffic Diversion off Hwy. 101	Moderate - To ocean front collector, East/West Devils Lake Road - To off-peak periods	Minimal	Major	Moderate To Bypass
Miles of Congested Road Segments (PM Peak Hour Level of Service "E" or "F")	2.5	0.0	0.0	0.0
Vehicle Miles of Travel (PM Peak Hour)	39,170	40,289	40,532	39,942
Vehicle Hours of Travel (PM Peak Hour)	7710	2067	3625	2109
Parking Removal along Hwy. 101	Minimal (difficult on-street parking maneuvers on Hwy. 101	Major - all on-street parking on Hwy. 101, plus some off-street parking fronting highway	Minimal	Major - all on-street parking parking on Hwy. 101 plus some off-street parking fronting highway
Social/Environmental Impact	Greatest neighborhood traffic encroachment	Business disruption with on-street parking removal	Bald eagle habitat encroachment	Business disruption with on-street parking removal and Bald eagle habitat encroachment
Compatibility Issues with State Planning Goals	Compatible with Goals	Compatible with Goals	Conflicts with Goal 4 - Forest Land, Goal 11 Public Facil. and Services, Goal 12 - Transp., and Goal 14 - Urbanization	Conflicts with Goal 4, Goal 11, Goal 12, Goal 14

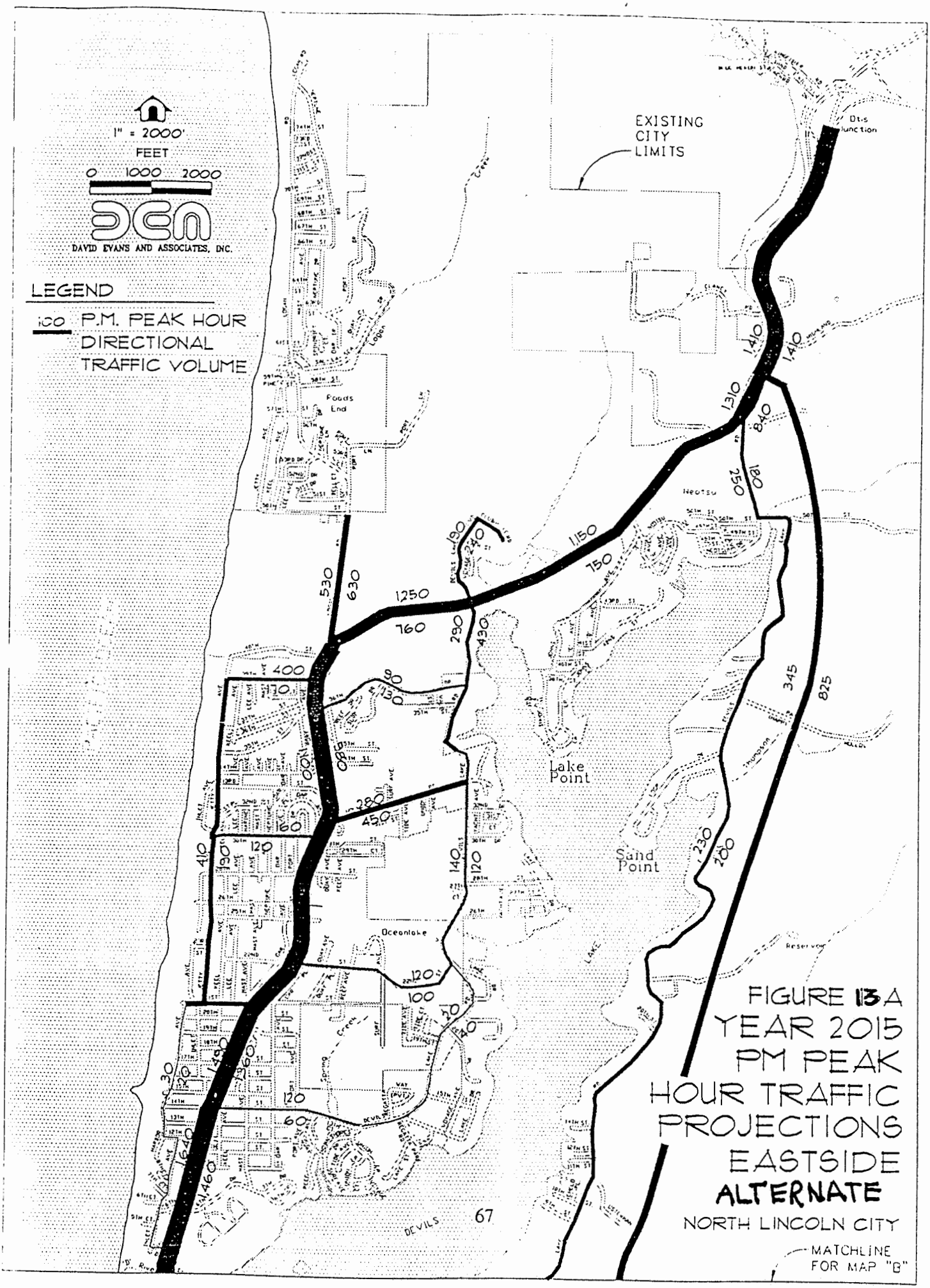


FIGURE 13A
YEAR 2015
PM PEAK
HOUR TRAFFIC
PROJECTIONS
EASTSIDE
ALTERNATE
NORTH LINCOLN CITY

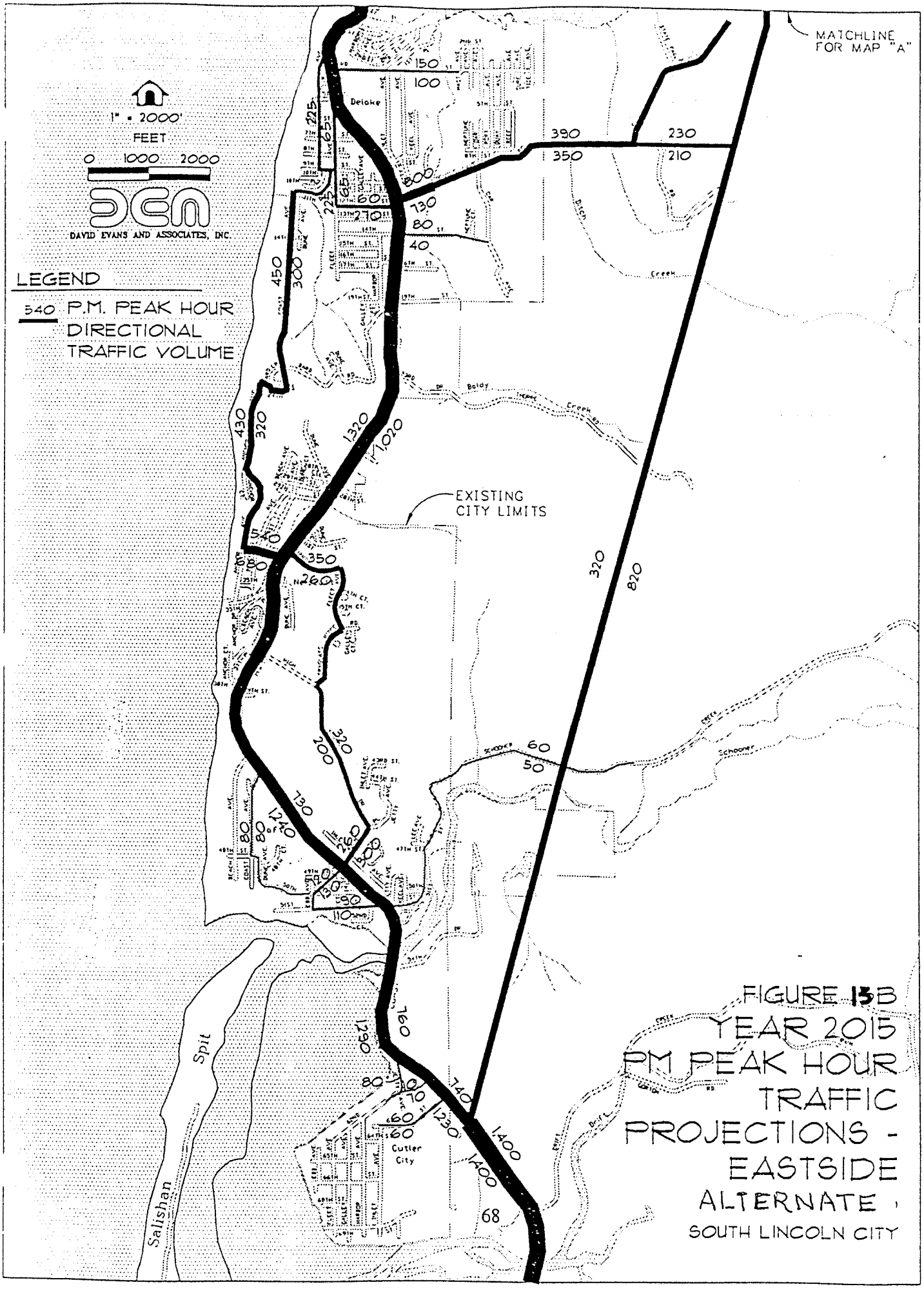


FIGURE 13B
YEAR 2015
PM PEAK HOUR
TRAFFIC
PROJECTIONS -
EASTSIDE
ALTERNATE
SOUTH LINCOLN CITY

<<<<<<<<<<<<<<<<<<<<<< C H A P T E R 6 >>>>>>>>>>>>>>>>>>>>>>

HIGHWAY 101 ACCESS MANAGEMENT ANALYSIS

The Oregon State Highway Division (OSHD), in its 1991 Highway Plan, devised a classification system to prioritize highway improvement needs; it arranges objectives in "levels of importance" on their highways. The categories of Oregon highways are: "Interstate", Statewide", "Regional" and "District". Hwy 101 is currently classified as a "statewide" highway. Such highways provide connections and links to larger urban areas, ports and major recreations areas.

ODOT has assigned Access Management Categories to every section of state highway in Oregon, and has tailored policies which would deal with every mode and circumstance--down to the number, spacing, type and location of private driveways, local street intersections, traffic signals, installation of medians, barriers and islands, etc.

ODOT's *Policies and Standards* and their *Access Management Categories*, along with the Federal Highway Aministration publication *Access Management for Streets and Highways* have been placed in Appendix X in this Plan, and will be used as an **informational** resource only. The following documents/publications are recommended for the improvement of Lincoln City streets and Hwy 101 (referred to in this plan as Lincoln City's "Main Street", and "principal arterial", the state's "Hwy 101", the "Hwy 101 Corridor", and "U.S. Hwy 101"): the *Subdivision Ordinance for Lincoln City [OR 78-32]* and *Residential Streets* (Editions 1 & 2) for design, and the *American Public Works Association Standards [OR. Chapter 1990]* plus the *Supplemental Standards for Lincoln City* for specifications.

The primary transportation policies expressed in this Master Plan are: 1. to maximize the utilization of existing roadway on Hwy 101 by removing on-street parking (converting those lanes to turn/travel lanes), 2. to relocate segments of bicycle lanes away from an overcrowded arterial to safer local roadways, 3. to widen the 2- and 3-lane sections of Hwy 101 (removing the bottlenecks throughout the length of the city), 4. to develop alternate north-south reliever routes, and 5. to improve certain problem intersections.

It is recognized that there is a need to utilize certain general roadway strategies. Present and future demands on this roadway--and present and future local economic indicators--require reasonable and prudent policies that would not only maximize road-function but also handle traffic in creative and efficient ways. Strategies may be drawn from the state Management Policies in Appendix X (or other sources) for consideration, study and testing. After the public hearings process, such policies (if adopted) may be implemented on a case-by-case basis on the city's roadways.

Hwy 101, as it traverses the city, functions as a link in the state's Hwy 101 Corridor. But it is Lincoln City's only north-south thoroughfare, and as such, it also functions as its "Main Street". Any ODOT "concept" or policy for Hwy 101 that would expedite through-traffic, disrupt functional local traffic patterns, or promote the use of the roadway as a "scenic attraction" at the expense of local access would be counter-productive to the overall goals of this Plan.

Chapt 7

STREET LIGHTING ANALYSIS

While most of the street system in Lincoln City has some level of lighting, much of the lighting is inadequate, both in terms of overall lighting level as well as the condition of poles and luminaires. There is a need to develop criteria and identify priorities for providing added street lighting in the future, to increase lighting levels on those streets which currently have lighting, as well as to add light poles on new streets and existing streets without lighting. Lighting priorities need to reflect the street classification system, as well as the type of land use in particular areas.

There is also a need to assess the feasibility and impact of City involvement in the ownership and/or maintenance of street lighting in Lincoln City. Currently the street lighting is owned and maintained by Pacific Power, with the City paying for lighting energy and maintenance costs (which are passed on to City residents and businesses through their utility bills).

CRITERIA FOR ADDITIONAL STREET LIGHTING

Street lighting warrants should be based on conditions relating to the need for lighting and the benefits that may be derived from lighting. Factors such as traffic volume, speed, road use during night, night accident rate, road geometry, and general night visibility are important in determining the minimum conditions to justify lighting. Justification for lighting should also be based on the economic returns of lighting as compared to the costs of not lighting. Economic returns for lighting are measured in terms of reductions in personal injuries, fatalities, property damage, and other societal costs. Additionally, more effective usage of the road and the possible increase in its capacity as a result of lighting should also be considered.

In general, lighting may be considered for those locations where the local jurisdiction concurs that lighting will contribute substantially to the efficiency, safety, and comfort of vehicular or pedestrian traffic. At a minimum, lighting should be provided for all major arterials in urbanized areas and for locations or sections of streets and highways where the ratio of night to day accident rates is high (say, higher than the statewide average for all similar locations) and a study indicates that lighting may be expected to significantly reduce the night accident rate.

Where such determinations to install lighting have been made on the basis of experience and accident data under certain existing conditions, application should be made of these conclusions to other similar highway sections. Lighting may also be considered at locations where severe or unusual weather or atmospheric conditions exist.

Warrants For Street Lighting

Specific criteria for improved street lighting, based on an analytical evaluation of driver information needs, were developed as a part of a national research study. The research effort identified the various driver visual information needs that can be satisfied by lighting of non-controlled access facilities, intersections, controlled access facilities, and interchanges, and then identified characteristics of the roadway facility that contribute to each of those information needs. The facility characteristics include geometric, operational, and environmental factors, and accidents. A rating system of 1 to 5 was established for each of the facility characteristics based on the extent to which the characteristics influence driver information needs. Also, each of the characteristics were weighted for unlighted and lighted conditions to account for their difference in impacts on driver information needs.

The classification factors (facility characteristics), their rating, their weights for unlighted and lighted conditions, and the warranting condition (points) are shown in warrant forms 1, 2, 3, and 4 (see Appendix G), for non-controlled access facilities, intersections, controlled access facilities, and interchanges.

Prioritizing Lighting Projects

A rational approach towards allocating street lighting funds to maximize benefits to motorists consists of computing an equivalent priority index, P_x, for any warranting lighting project, X, and then comparing it with all other competing projects. The projects are then prioritized from top to bottom, with the highest ranked project having the highest priority index. A recommended technique for calculating the priority index, as given in NCHRP Report No.152, is:

$$P_x = [E * (NADT/n) * L * (F/W)] / AC$$

where P_x is the priority index,
- E is the calculated lighting effectiveness (total warranting points),
- NADT is the design night average daily traffic,
- n is the number of lanes,
- L is the affected lane miles,
- F is the actual design level of average illumination (fc),
- W is the warranted design level of average illumination (fc), and
- AC is the annual cost.

The priority index may not, however, always govern the prioritization of lighting projects. Very often, other factors are considered in precedence of a cost-effective analysis. Such factors include funding source guidelines based on traffic facility classification, environmental ramifications of a lighting project, and political acceptability to the governing authority and citizens.

OPERATIONAL/ADMINISTRATIVE ALTERNATIVES

In a 1986 Oregon State street lighting study[4], options were identified to reduce energy-related city street light expenditures. These options included:

1. Delamping - temporary or permanent removal of selected street lights.

2. Conversion - replace existing lights with more energy-efficient lights (e.g. replace mercury vapor with high pressure sodium vapor lights).

3. System purchase - buy system from the utility company. City could maintain system or have the utility company continue maintenance.

4. Reduction in operating hours - decrease the hours of street light operation to a portion of the night instead of from dusk to dawn.

5. System redesign - possible reconfiguration of the system (i.e. reduce lumens for a given location, or replace several small lights with one large light).

The study applied the different options to all cities in Oregon, including Lincoln City. The analysis identified the following savings:

- $21,000 annual savings with a 20% delamping, $10,000 savings with a 10% delamping.
- $51,000 annual savings if City were to purchase and maintain system.
- $71,000 annual savings if a combined option were chosen (City removes 20 percent of the lights, owns and maintains the system, and converts all lights to high pressure sodium vapor).

While the study presents good options to improve the street lighting system in Lincoln City, it treated all street segments within the city equally. As the study did not take into account the differences in street width, average daily traffic, street classification, surrounding areas (e.g. CBD, residential, etc.), caution must be exercised in inferring from the conclusions of the street lighting study.

FACILITY PLAN PREPARED BY PACIFIC POWER

In September 1992, Pacific Power & Light Company completed a street lighting improvement plan for Lincoln City. The plan contains recommendations for lighting improvements within the city and identifies all costs associated with existing and proposed installations. The plan follows guidelines established in the current American National

[4] Jonathan Raab, *City Street Lighting in Oregon - Inventories, Expenditures, and Opportunities.*

Standard Practice for Roadway Lighting as sponsored by the Illuminating Engineering Society.

Recommended Lighting Units

In accordance with Pacific Power's specifications, all new street lighting should be high pressure sodium vapor. Three sizes have been recommended for installation:

1. 9500 lumen, 100 watt
2. 22,000 lumen, 200 watt
3. 50,000 lumen, 400 watt

For the 9500 lumen fixture, the mounting height of the fixture would be 25 feet, 30 feet for the 22,000 lumen fixture, and 35 feet for the 50,000 lumen fixture.

Proposed Installations

The following types of street lighting installations have been recommended by Pacific Power:

1. Wood pole installations with overhead circuits (existing wood poles to be utilized as much as possible);

2. Wood poles with underground circuits (mainly in residential subdivisions which are or will be served by underground circuits); and

3. Metal pole installations with underground circuits (mainly in new commercial areas served by underground circuits).

Photocells should be used to turn street lights on and off at established levels of natural light intensity.

Chapter 8

PUBLIC TRANSIT FEASIBILITY ANALYSIS

DEVELOPMENT AND LOCATIONAL FACTORS

Local development patterns and the street network are important to the effectiveness of fixed route transit service. Higher density residential and commercial development as well as street patterns which allow direct access to these areas increase the efficiency and convenience of transit by providing a focus for route development, and allowing easy and direct passenger access to the system. General transit guidelines indicate that fixed route transit will tend to attract the most riders within 1,500 feet (1/4 mile) from their residence and 500 feet from destinations such as offices, shopping centers, recreational areas, etc. In addition, grid or modified grid street patterns are the most conducive to efficient bus routing because they allow through travel and facilitate bus transfers.

Lincoln City has several commercial, employment and recreational centers and a relatively cohesive set of neighborhood areas (see Figure 17).[14] This development pattern combined with a modified grid street pattern, which connects most of these areas through the City's major arterial (Highway 101) and/or through collector streets which connect directly to the Highway, indicates that the City would be relatively easily served by a fixed route system. In addition, with most of the neighborhoods allowing for through access, the majority of residents and businesses could be served within the quarter mile stop standard.

Ridership Potential

Transit use is dependent upon a variety of factors. Riders, however, can usually be put into two categories: 1) those who do not have an automobile available and 2) those who find it as or more convenient to use transit than to use their car. Individuals in the former category, the transportation disadvantaged, are more likely to be low-income, over 65 years of age (elderly), under 16 years of age (students) or disabled. Those in the latter category are more likely to be using transit for a specific trip only (e.g. work trip), or unfamiliar with the community. The determining factor, however, will be their ability to easily and conveniently access the system.

The permanent population in Lincoln City was 6,149 in 1992. This is less than a 10% increase over the 1980 population and at less than 1% annually is a somewhat slower growth rate than the two previous decades (about 2% annually). The north/south orientation of the City has concentrated the population along Highway 101 with one notable exception: the Roads End area, which is not in actual city limits but is part of the Lincoln City Urban Growth Area.

Lincoln City is a "retirement community", as is reflected in the age breakdown of the population.

According to the 1990 Census, over 31% of the current population in Lincoln City is over the age of 62. This is almost 2 1/2 times the 1990 national average of 12.5% and more than twice the 1990 Oregon average of 14%. A more detailed look at the population (see Figure 18) indicates that while those 62 and over are dispersed throughout the community, a slightly higher percentage (40% to 55%) of seniors can be found in the neighborhoods to the northwest of the Lincoln City Community Center (See map next page). This includes the Roads End neighborhood where over 50% of the permanent population is aged 62 or older.

In addition to the permanent population, Lincoln City also has a considerable influx of visitors. During peak-visitor months (June - September) seasonal residents can push the population in Lincoln City to over 10,500. To date, the areas closest to the ocean front have had the greatest concentration of seasonal residents. However, it is estimated that by the year 2015 a number of new resort communities (e.g. Timbershore, No-Ah-Soo) will be developed in Lincoln City along Highway 101.

There are several potential transit markets in Lincoln City. A system which targets the specific needs of these groups, assists in reducing the transportation impacts of visitors and has strong community support in Lincoln City could have a solid ridership base for fixed-route transit service.

Community Support

Perhaps the single most important factor in implementing fixed route service is community support. Community support is critical for three reasons:

1. **System Financing**: Like other community services, finding the funds to operate a transit system during a time of fiscal constraint is not an easy task. The community must understand the benefits of and support the idea of fixed route transit in their community if difficult funding decisions are to be made and innovative financing strategies pursued.

2. **Regulatory Support**: The cost-effectiveness and efficiency of a transit system can be increased dramatically if the community can implement regulatory statutes that support transit by discouraging automobile use. Community support for a transit system can help local decision makers put restrictions on parking, require new developments to be "transit friendly", and support a transit/pedestrian environment.

3. **Marketing and System Use**: Marketing efforts and ridership can be encouraged through the community businesses and local employers that are familiar with and support the transit system. Retail and hotel/motel establishments can informally promote transit to their customers, while local employers can provide incentives to their employees that use transit.

Local concern with traffic congestion, neighborhood/environmental preservation and pedestrian environment were expressed at the June 4, 1992 Lincoln City Transportation Master Plan Study Town Hall Meeting. These issues along with more direct concerns of local mobility needs indicate that there is some direct and/or indirect community support for accommodating and providing some sort of fixed route transit service in Lincoln City. This coupled with the recent support of a fixed-route shuttle system for Antique Week by the Visitors and Convention Bureau and the recent discussion on the potential for a Light Rail/Street Car system at the local Chamber of Commerce indicate that a well defined, well targeted service might be able to receive the community support needed to finance, implement and support a fixed route transit system in Lincoln City.

POTENTIAL TRANSIT MARKETS

Functional Objectives

The brief overview of current conditions suggest that Lincoln City could support a well targeted, cost-effective and efficient fixed-route transit system. The primary functional objectives of any potential fixed route transit service for Lincoln City should be the establishment of effective linkages between current and planned alternative transportation service in Lincoln City. The system should provide a comprehensive network of transit service that would address the differing transit needs of Lincoln City. In addition, the system should contribute to the maintenance of a high standard of mobility for all the community's residents and visitors, while reducing the impacts of private auto usage on the City's neighborhoods and environment.

Target Markets

Perhaps the most difficult assignment in the development of a fixed-route system for Lincoln City is creating a system that people will use. As mentioned above, there are three populations within Lincoln City that could be targeted for a fixed route system. These include the senior population, the service-worker employee and the seasonal visitor. We recommend that the primary ridership market of any potential fixed-route transit for Lincoln City should be the in-town trips of the seasonal visitors while the in-town trips of local residents, including employees and the senior population, should be secondary.

The recommendations are based on the following observations:

1. **Senior Transit Needs:** The transit needs of the Lincoln City population 65 and older are currently serviced by the Council on Aging curb-to-curb demand responsive service and the Senior Center door-to-door service. Ridership statistics from the Council on Aging indicate that the fixed-route system which ran for a limited time in Newport had no impact on the Council on Aging demand responsive service in that community. This is not

surprising, since a curb-to-curb service offers transportation which is closer, easier to access, more convenient and more flexible than its fixed route (schedule and stop specific) counter-part. Essentially this means that a fixed-route service which targeted the senior population would: a) have to work out an agreement with the current providers to limit their service and/or ridership base (something which would be very unpopular among their current riders), or b) try to compete with curb-to-curb/door-to-door services which would likely be unsuccessful.

2. **Employee Transit Needs:** Targeting an employee ridership market in major cities has some merit since employers are often concentrated in a particular area (e.g. downtown) and parking is often limited. Smaller urban areas, like Lincoln City do not offer the same type of opportunities for employee transit use nor do they have a sufficient employee base to sustain ridership numbers to make an all day fixed-route transit system cost-effective and efficient. In addition, the peak period emphasis of the Lincoln City - Newport service, which will begin in Fall 1992, is designed to offer transportation options to employees who live and work along Highway 101.

3. **Visitor Transit Needs:** While it almost seems like a contradiction to believe that visitors who come to Lincoln City in their automobiles would have transit needs, the opportunities to provide an effective and cost-efficient service to seasonal visitors are considerable. There are three reasons for this:

   - Local officials have the opportunity to restrict and/or concentrate parking opportunities and street access during peak-visitor periods making auto travel inconvenient;
   - Visitor destinations are fewer than those of local resident (e.g. beach, recreational opportunities, retail shopping and restaurants) and can be directly targeted;
   - People who are unfamiliar with a community and/or destinations within that community (especially if parking or driving is made inconvenient) are more likely to use another form of transportation.

The visitor population has the potential of providing a ridership base for fixed-route service in Lincoln City, if such service is part of a comprehensive transportation plan.

VEHICLE TYPE

Recently, there has been some discussion about the possibility of a Light Rail and/or People Mover in Lincoln City along Highway 101. While a fixed-route Light Rail Transit (LRT) system does have some advantages for a tourist oriented economy, minimum Federal requirements for LRT construction and operation assume 15,000 boarding riders per day.

Lincoln City does not have the population base (even at peak seasonal population) to support the ridership, construction and operating costs of such a system.

There are several criteria that should be considered in the selection of fixed-route service vehicles. Vehicles should be attractive, easy to access and in good condition. Also, the coloring and outward appearance of the vehicles should be enticing to the visitor and build upon current community themes. Finally, vehicle cost should reflect the size of the community and the ridership potential.

Based on these criteria, it is recommended that any fixed-route bus service be provided by newly purchased, colorfully designed 25-passenger, lift-equipped vans.

ROUTE AND SERVICE LEVEL ALTERNATIVES

Two route/service options for improved public transportation in Lincoln City were identified for analysis. The first option would be the institution of fixed-route bus service throughout the year, with more routes and a higher frequency of service during the summer peak visitor period (Memorial Day to Labor Day). The second option would have fixed-route bus service only during the summer peak period, with an expanded demand-responsive bus service developed to handle off-season (Labor Day to Memorial Day) travel demands.

Option #1 - More Extensive System

Summer Peak Period Operation (Memorial Day - Labor Day)

Emphasis

During the summer peak period the emphasis of the fixed-route service would be to encourage visitors to use transit during their stay in Lincoln City. The system would be coordinated with other transportation plans to respond to visitor-related transportation concerns. The key to this service would be ease, convenience and accessibility to major attractions.

Routes

The summer peak fixed-route system would have three routes (see Figure 19). The routes would be as follows:

Route #1 - Highway 101 from Roads End Neighborhood to Culver City

This route would have 15 minute headways (run every 15 minutes) from 10:00 am to 9:00 pm seven days a week. While the system would be flag stop (you can flag the bus to stop on any portion of the route) major designated stopping points would include: the shopping centers at N.W. Logan Road and Highway 101 (also a transfer point to route #2), the Lincoln City Community Center, the Delake shopping area (another transfer point for route #3 and possible intercity transit service to Newport), Devils Lake State Park, outlet stores, the Factory Stores at Lincoln City outlet center, and the Lincoln City City Hall.

To implement the above route four vehicles and seven full-time and one part-time driver would be necessary.

Route #2 - North Ocean Front and West Devils Lake Road Circulator

This route would have 30 minute headways (run every 30 minutes) from 10:00 am to 9:00 pm seven days a week. While the system would be flag stop (you can flag the bus to stop on any portion of the route) major designated stopping points would include: grocery stores at N.W. Logan Road and Highway 101 (also a transfer point for route #1), beach access points at 40th, 33rd, 26th, 21st and 15th street, Regatta Park on Devils Lake, North Lincoln Hospital and Holmes Road Park.

To implement the above route, two vehicles and three full time and one part time driver would be necessary.

Route #3 - South Ocean Front and High School Drive Circulator

This route would have 30 minute headways (run every 30 minutes from 10:00 am to 9:00 pm seven days a week. While the system would be flag stop (you can flag the bus to stop on any portion of the route) major designated stopping points would include: Delake shopping area (transfer point for route #1 and possible transfer for intercity transit service to Newport), Canyon Drive Park, beach access on 33rd and 51st Streets, the Taft shopping district, and Lincoln City City Hall.

To implement the above route, two vehicles, and three full-time and one part-time drivers would be necessary.

Service Coordination

Any potential fixed route service will need to comply with the regulations of the new Americans with Disabilities Act (ADA). The act requires that new fixed route services be 100% accessible to individuals in wheelchairs and that each public fixed route system provide paratransit or other special service to individuals with disabilities that is "comparable to the level of service provided to individuals without

disabilities who use the fixed route system." If coordination with the current Council of Aging services can be achieved, complementary ADA service should not be an issue for weekdays.

A fixed-route bus service would directly impact the Lincoln City Cab company. It would be appropriate for the City to consider contracting with the current Cab owner to provide the fixed-route service and/or to provide the complementary paratransit service on weekends.

The system should provide an appropriate transfer facility for the proposed inter-city Lincoln City to Newport. This facility should be convenient and provide shelter for individuals who wished to transfer. The facility should be located on Highway 101 and could be integrated into a proposed visitor parking facility.

Capital Costs

Estimated start-up cost for the system would include:

1.	8 vehicles @ $60,000 each	$480,000
2.	25 stop signs @ $250 (includes labor) each	6,250
3.	2 potential transfer areas (will vary depending on design could be as much as $75,000).	150,000
	TOTAL	**$636,250**

Operating Costs

Operating costs have been estimated @$18.00 per revenue hour. (This assumes seasonal labor costs and costs necessary to implement ADA.)

Total costs for a seasonal peak service (100 day x 8 buses x 11 hours a day x $18/hour = $158,400

System Financing and Fare Structure

Since the seasonal peak period service is designed to meet the needs of the seasonal visitor, we recommend that the service be financed through the transient room tax - specifically, from the 3% that have been set aside for transportation projects. This would allow the service to have a consistent funding source, would effectively tax the targeted market, and would provide a way for the community to deal with visitor-related transportation concerns.

Based on the target market, and the proposed financing we recommend that the service be free of charge.

Ridership

It is estimated that annual boarding riders (one-way trips) on the 3 routes would be about 30,000.

Off-Peak Period Operation (Labor Day - Memorial Day)

Emphasis

During the off-peak periods the emphasis of the system would be to improve alternative transportation options to local residents. This would include facilitating mobility between neighborhoods and local activity centers.

Routes

The off-peak fixed route service would have one route. This route would be as follows:

Route #1 - Highway 101 from Roads End Neighborhood to Culver City

This route would be almost identical to route #1 in the seasonal peak period. However, the headway on the route would be reduced from 15 minutes to 30 minutes headways (run every 30 minutes) and service hours would be reduced from 10:00 am to 3:00 pm seven days a week.

Like the seasonal peak service, the system would be flag stop (you can flag the bus to stop on any portion of the route) major designated stopping points would include: grocery stores at N.W. Logan and Highway 101 (also a transfer point to route #2), the Lincoln City Community Center, the Delake shopping area (another transfer point for route #3 and possible intercity transit service to Newport), Devils Lake State Park, the Factory Stores at Lincoln City outlet center, and the Lincoln City City Hall.

To implement the above route, two vehicles and two full time drivers would be necessary.

Service Coordination

Like the seasonal peak service, if coordination with the current Council of Aging services can be achieved, complementary ADA service should not be an issue for weekdays. It would be recommended, however, if Lincoln City were to implement such a seasonal off-peak, fixed-route service that they work with the Council on Aging to place restrictions on the eligibility requirement for those who would be able to use the curb-to-curb service. This will keep the two services from competing for

riders and funds. (See additional discussion below under Financing System and Fare Structure.)

This service would also impact the Lincoln City Cab company. It would be appropriate for the City to consider contracting with the current Cab owner to provide the fixed-route service and/or to provide the complementary service on weekends.

The service is proposed from 10:00 am to 3:00 pm to compliment the proposed inter-city Lincoln City to Newport. Inner-city to Inter-city transfers should be encouraged during the midday.

Capital Costs

Assuming that the seasonal peak vehicles were purchased, no additional capital costs would be required.

Operating Costs

Operating costs have been estimated @$24.00 per revenue hour. (This assumes yearly labor costs and costs necessary to implement ADA.)

Total costs for a seasonal peak service (256 day x 2 buses x 5 hours a day x $24/hour = $61,400.

System Financing and Fare Structure

Since the seasonal off-peak period service is designed to meet the needs of the local resident, and because the Council on Aging would be asked to curtail current curb-to-curb service as a response to implement the service, we recommend the service be financed from the city's general fund and through County Special Transportation Funds.

Based on the target market, and to provide some consistency with the seasonal peak service, we recommend that the service be free of charge.

Ridership

It is estimated that annual boarding riders (one-way trips) on this route would be about 15,000. This would include a reduction in annual Council on Aging ridership from 22,000 to about 11,000. Estimated annual gains would be about 4,000 boarding riders.

Option #2 - Less Extensive System

Summer Peak Period Operation (Memorial Day - Labor Day)

Emphasis

During the peak period the emphasis of fixed-route service would be to encourage visitors to use transit during their stay in Lincoln City. The system would be coordinated with other transportation plans to respond to visitor-related transportation concerns. The key to this service would be ease, convenience and accessibility to major attractions.

Routes

There would be two routes (see Figure 20). The routes would be similar to the route #2 and route #3 in option #1, with six major differences.

1. The full length of the routes would be 30 minutes long. With 15 minute headways on each route.

2. The two routes would have a transfer point in the Delake shopping area.

3. Route #3 would not go down High School Drive, but would stay on Highway 101.

4. Route #2 would not go down West Devils Lake Road, but would stay on Highway 101.

5. Both routes #2 & #3 would be tied to the creation of new parking facilities. Suggestions might include a parking facility at N.W. Logan Road and Highway 101 for south bound drivers and a parking facility near the outlet stores for north bound drivers. Day visitors would be encouraged, through other parking restrictions and marketing efforts, to park their automobiles in these areas and to use transit for their in-town trips.

6. The emphasis of routes #2 & #3 would be major tourism activity areas with the goal to mitigate traffic congestion and parking issues in-town.

7. Since the emphasis would be to mitigate traffic congestion and parking issues it would be important to target the times of the day when tourist traffic is highest. It is assumed that would be between 9:00 am /10:00 am through 4:00 pm/5:00 pm during seasonal periods.

To implement the above routes four vehicles and five full-time and one part-time driver would be necessary.

Service Coordination

Service coordination with the other providers would as described in your scenario, with three transfers from the inter-city route to the inner-city route.

Capital Costs

Estimated start-up cost for the system would include:

1.	4 vehicles @ $60,000 each	$240,000
2.	25 stop signs @ $250 (includes labor) each	6,250
3.	1 major transfer area (will vary depending on design could be as much as $75,000).	75,000
	TOTAL	**$321,250**

Operating Costs

Operating costs have been estimated @$18.00 per revenue hour. (This assumes seasonal labor costs and costs necessary to implement ADA.)

Total costs for a seasonal peak service (100 day x 4 buses x 8 hours a day x $18/hour = $57,600

System Financing and Fare Structure

System financing would be through the transient room tax and the service be free of charge.

Ridership

It is estimated that annual boarding riders (one-way trips) on the two routes would be about 20,000.

Off-Peak Period Operation (Labor Day - Memorial Day)

Emphasis

During the off peak periods the emphasis of the service would be to improve alternative transportation options to local residents. This would include facilitating mobility between neighborhoods and to local activity centers.

Routes

The Council on Aging (COA) would be provided with additional funding and the peak-period buses so that they may expand their current services and hire paid drivers. The City could stipulate that the service be provided to the general public and that a minimal fare be charged (e.g. $.25).

Service Coordination

Service coordination with inter-city service would be assured.

Capital Costs

Assuming that the seasonal peak vehicles were purchased no additional capital cost would be required.

Operating Costs

Additional operating costs could include two full-time drivers (estimated @ $25,000 each, includes full benefits).	$50,000

System Financing and Fare Structure

General funds and minimal fare ($.25).

Ridership

The Council on Aging estimates that with two full-time drivers and additional buses they could double ridership in Lincoln City. This would be 44,000 boarding riders annually.

Summary

Option #1, the more extensive fixed-route system with three routes during the summer peak period and one route during the off-peak months, would cost about $2.8 million, in today's dollars, for capital and operating costs over the next ten years. This compares to about $1.4 million in capital and operating costs over the same period for the less extensive fixed-route system, with two routes during the summer and only expanded Council on Aging dial-a-ride service during the off-peak months. The annual ridership with the more extensive system is expected to be around 50,000, with 20,000 for the less extensive system. However, the less extensive system could double the dial-a-ride ridership.

SUMMARY

Given its unique geographic layout and extensive elderly population, fixed-route bus service has potential application in Lincoln City. It appears that this service can be most economical if focused on serving tourists and seasonal residents during the summer peak period (Memorial Day to Labor Day). The most economical service strategy would be to limit the fixed route service to summer months, with an expanded dial-a-ride operation to handle off-peak month travel demands (option #2). This strategy would also have the least impact on the existing dial-a-ride, cab, and intercity bus operations, and would best complement these services.

This analysis is only intended to be a starting point in the evaluation of the feasibility of fixed-route bus service in Lincoln City. A more extensive Transit Development Program study should be sponsored by the City to further evaluate service and administrative alternatives and to develop a final transit plan. Funds for such a study may be available through a grant program administered by the Public Transit Division of the Oregon Department of Transportation.

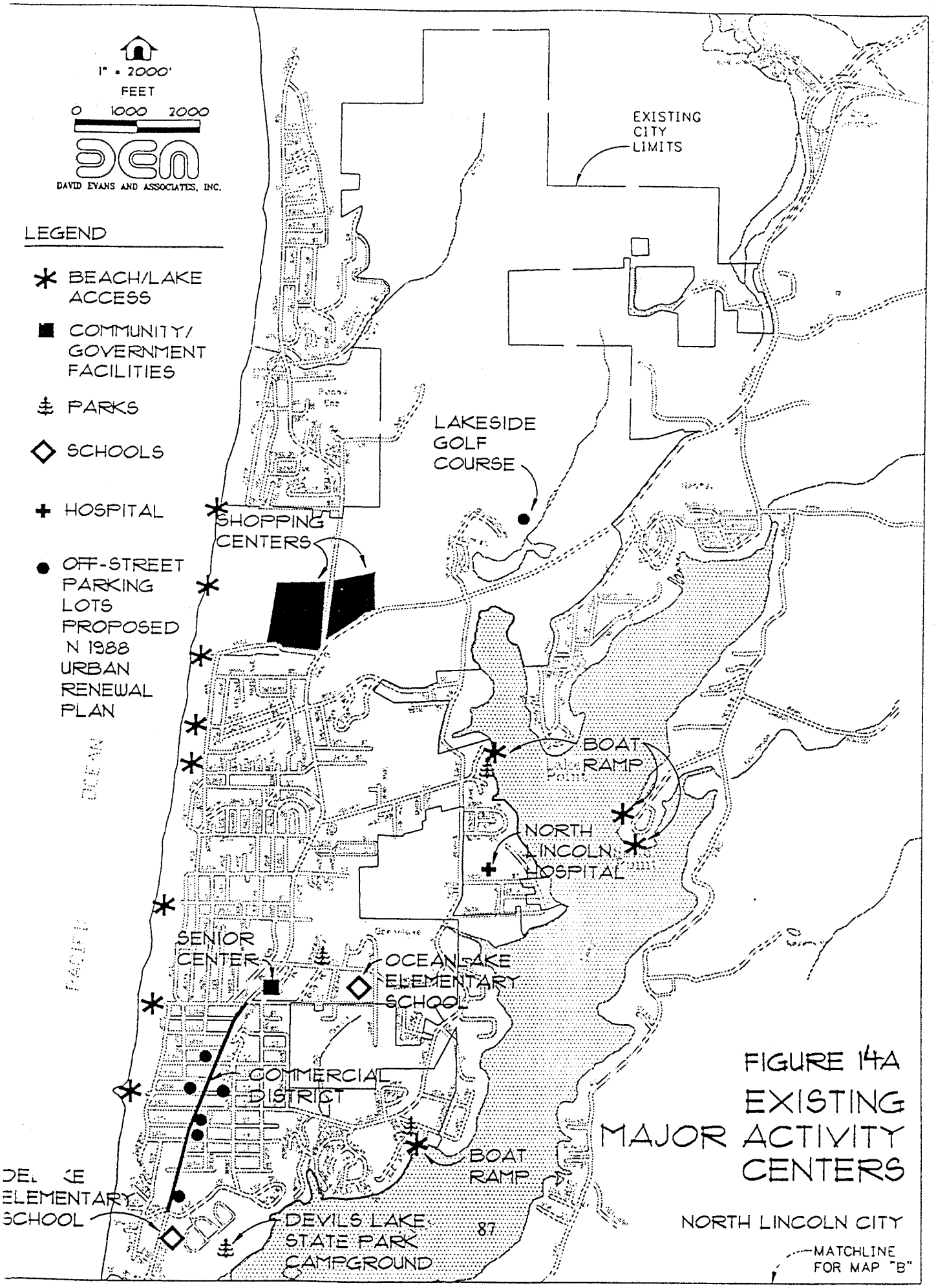


FIGURE 14A

EXISTING MAJOR ACTIVITY CENTERS

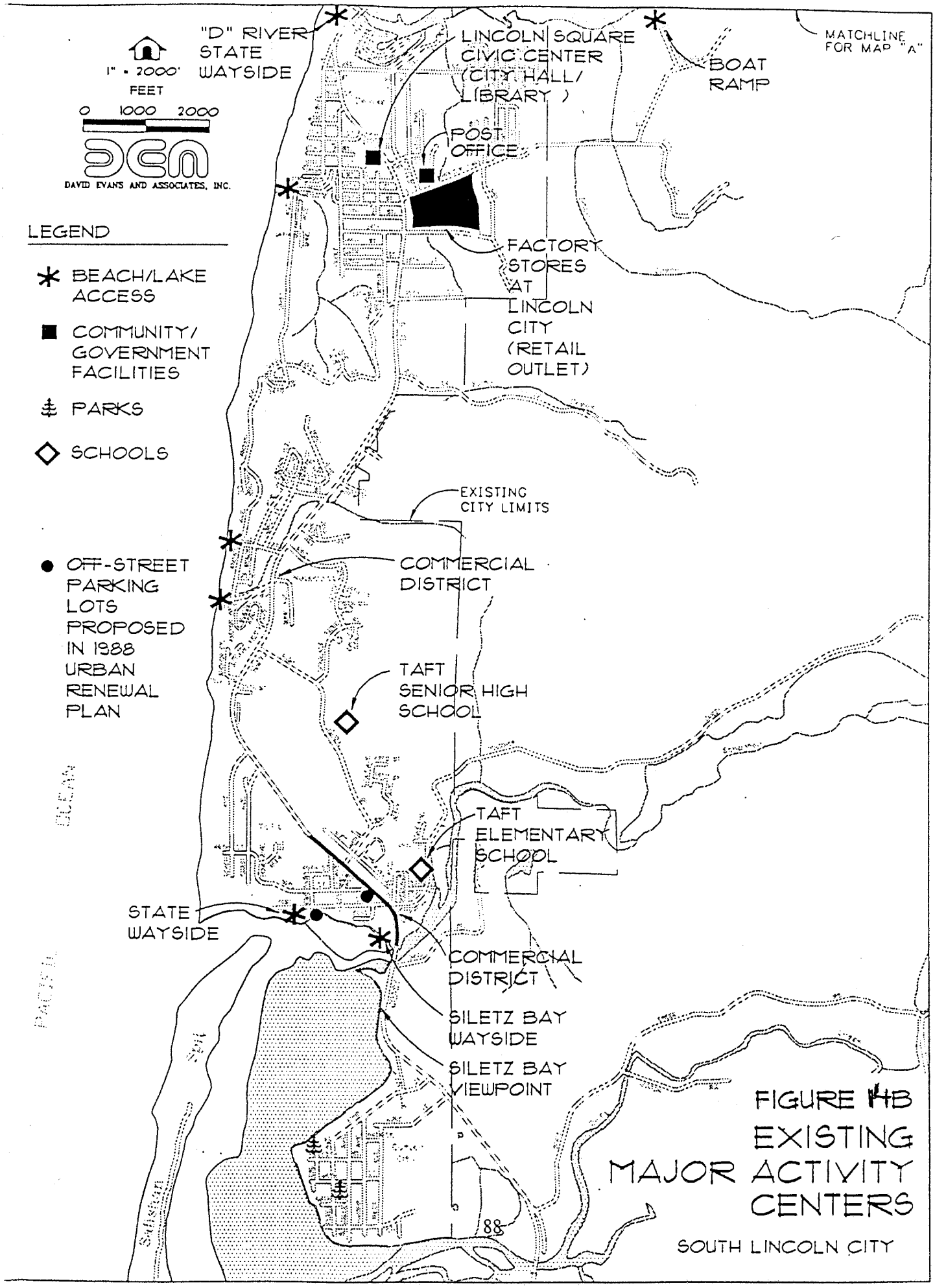
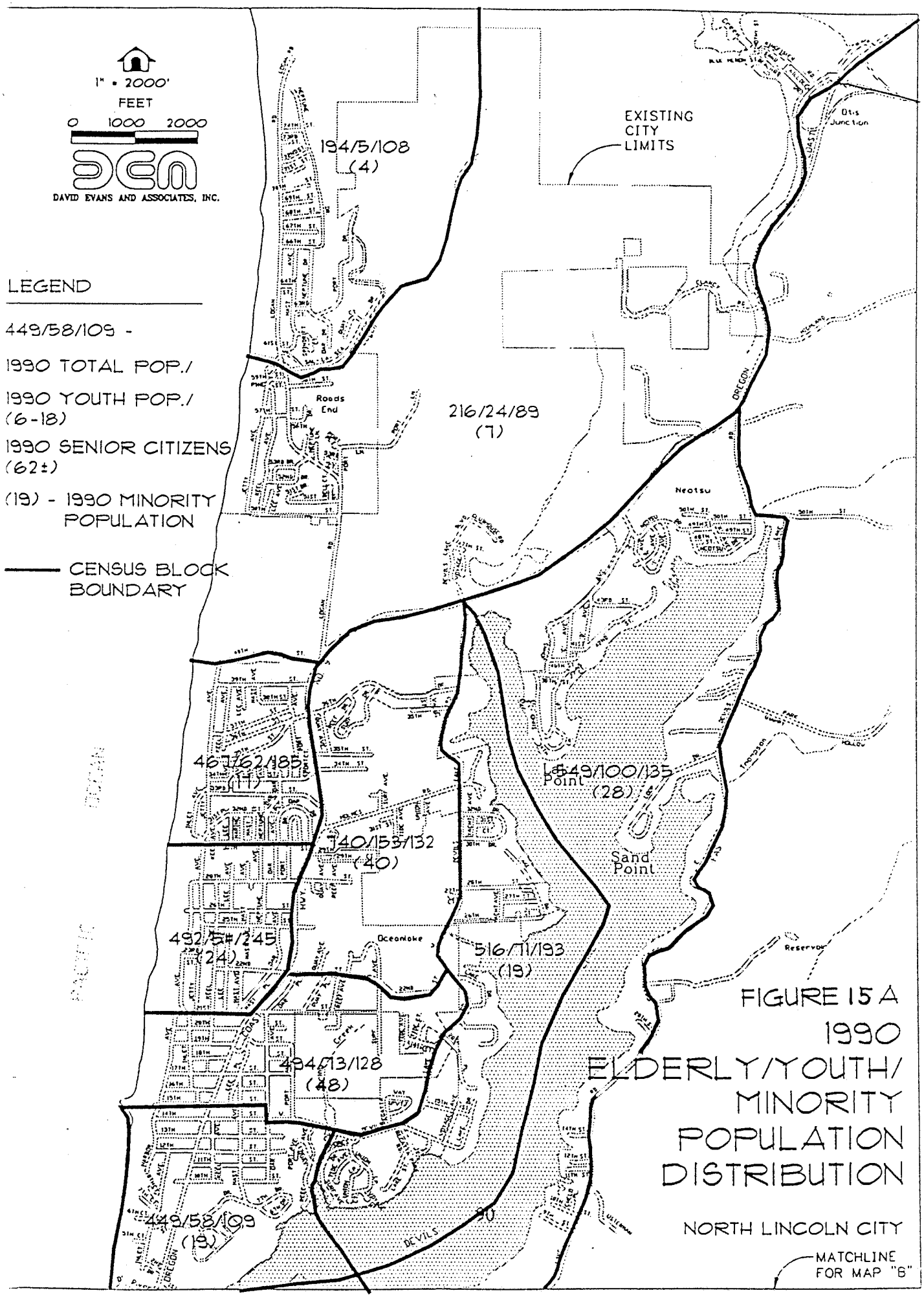
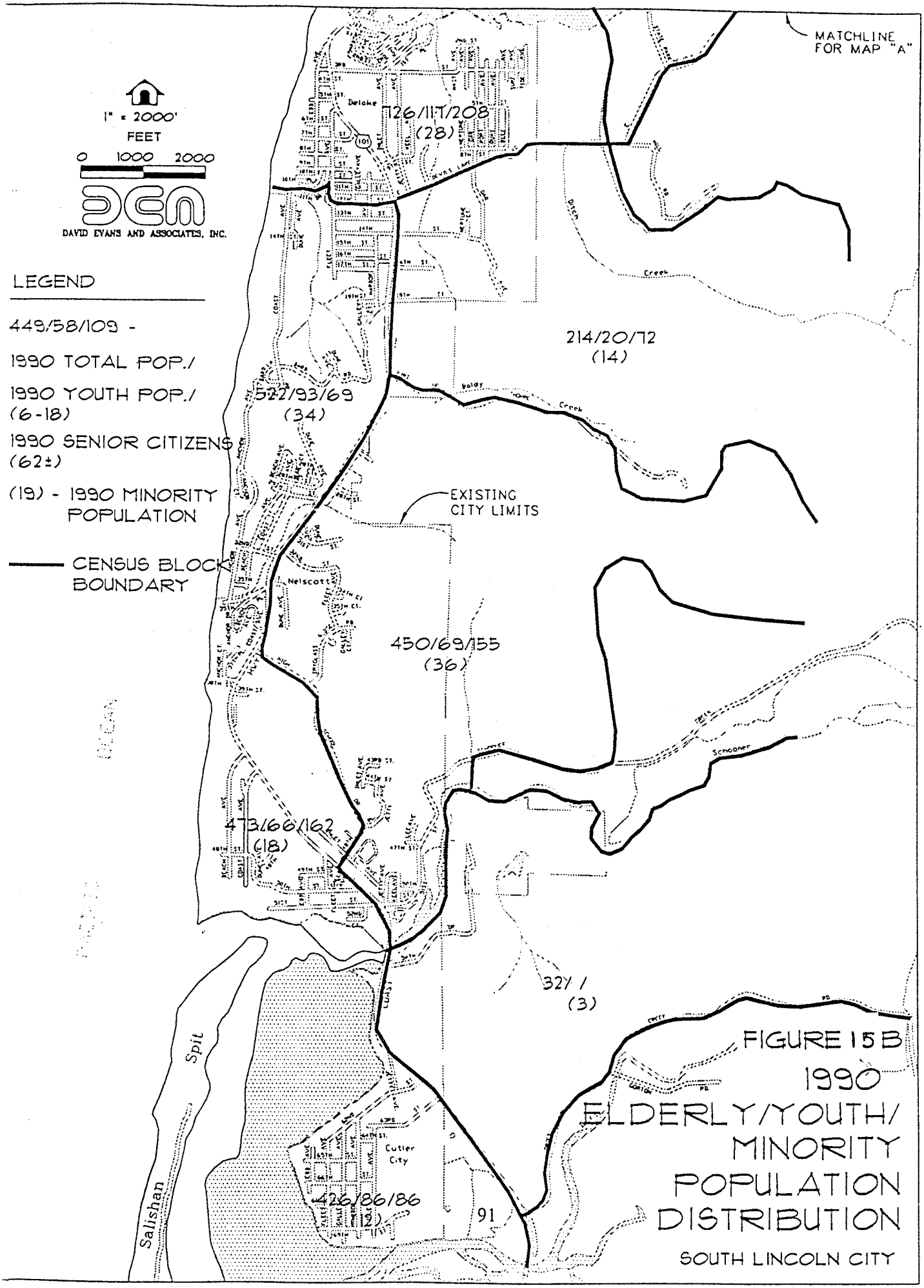


FIGURE #B

EXISTING MAJOR ACTIVITY CENTERS

SOUTH LINCOLN CITY


1" = 2000'
FEET
0 1000 2000
DAVID EVANS AND ASSOCIATES, INC.
LEGEND
449/58/109 -
1990 TOTAL POP./
1990 YOUTH POP./
(6-18)
1990 SENIOR CITIZENS
(62±)
(19) - 1990 MINORITY POPULATION
CENSUS BLOCK BOUNDARY
EXISTING CITY LIMITS
194/5/108
(4)
216/24/89
(7)
Roads End
Otis Junction
Neotsu
OREGON
467/62/185
(11)
740/153/132
(40)
492/5#/245
(24)
Oceanlake
516/11/193
(19)
494/13/128
(48)
449/58/109
(19)
549/100/135
(28)
Point
Sand Point
Reservoir
DEVILS
FIGURE 15A
1990
ELDERLY/YOUTH/
MINORITY
POPULATION
DISTRIBUTION
NORTH LINCOLN CITY
MATCHLINE FOR MAP "6"


1" = 2000'
FEET
0 1000 2000
DAVID EVANS AND ASSOCIATES, INC.
LEGEND
449/58/109 -
1990 TOTAL POP./
1990 YOUTH POP./ (6-18)
1990 SENIOR CITIZENS (62±)
(19) - 1990 MINORITY POPULATION
CENSUS BLOCK BOUNDARY
MATCHLINE FOR MAP "A"
126/117/208
(28)
214/20/72
(14)
522/93/69
(34)
EXISTING CITY LIMITS
450/69/155
(36)
473/66/162
(18)
327/
(3)
426/86/86
(12)
Delake
Nelscott
Cutler City
Salishan
Spit
Creek
Schooner
91
FIGURE 15B
1990
ELDERLY/YOUTH/
MINORITY
POPULATION
DISTRIBUTION
SOUTH LINCOLN CITY

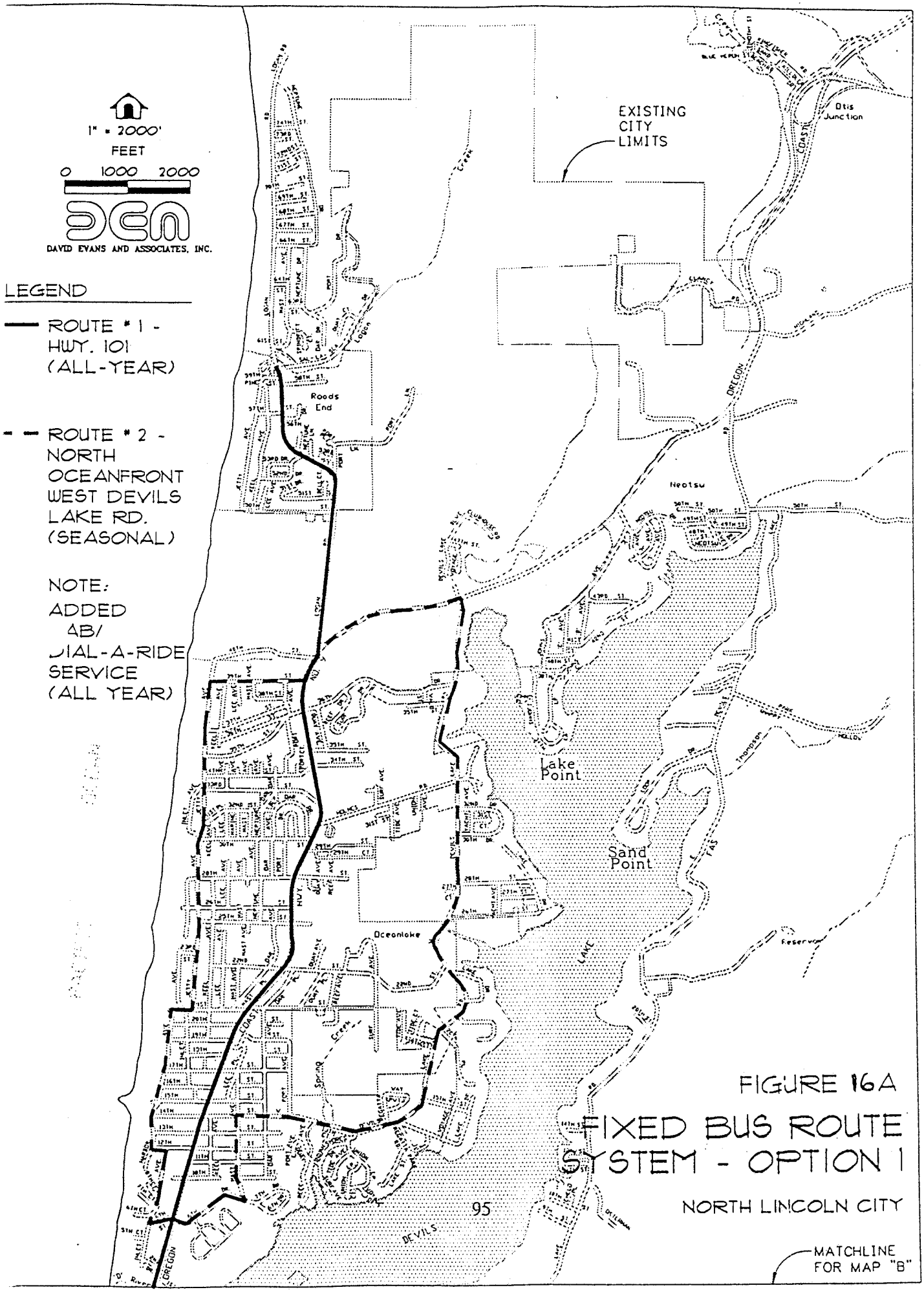


FIGURE 16A

FIXED BUS ROUTE SYSTEM - OPTION 1

NORTH LINCOLN CITY

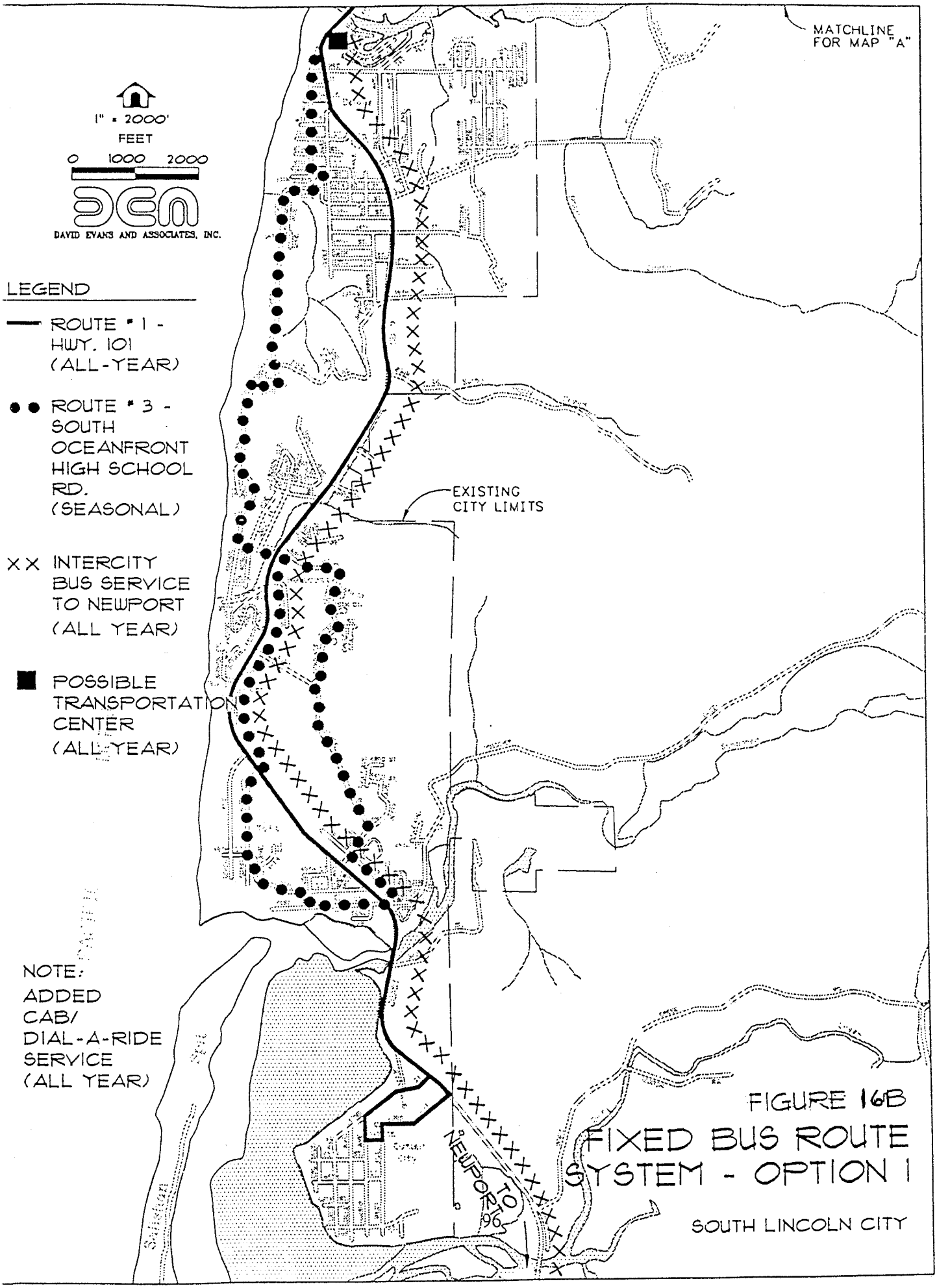
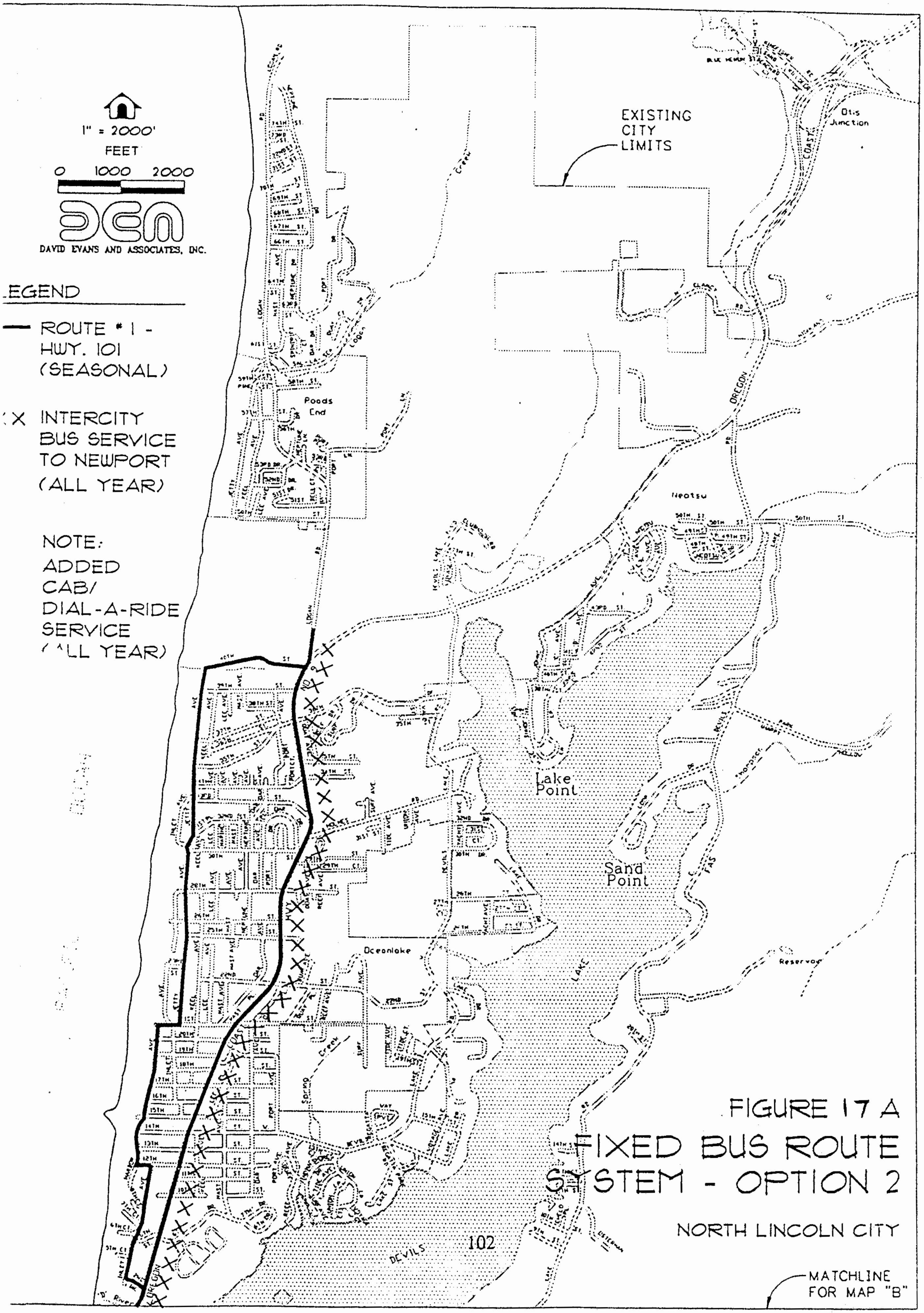


FIGURE 16B
FIXED BUS ROUTE SYSTEM - OPTION 1


1" = 2000'
FEET
0 1000 2000
DAVID EVANS AND ASSOCIATES, INC.
LEGEND
ROUTE # 1 - HWY. 101 (SEASONAL)
X INTERCITY BUS SERVICE TO NEWPORT (ALL YEAR)
NOTE: ADDED CAB/ DIAL-A-RIDE SERVICE (ALL YEAR)
EXISTING CITY LIMITS
Otis Junction
Roads End
Neotsu
Lake Point
Sand Point
Oceanlake
Reservoir
DEVILS
LAKE
FIGURE 17 A
FIXED BUS ROUTE SYSTEM - OPTION 2
NORTH LINCOLN CITY
MATCHLINE FOR MAP "B"

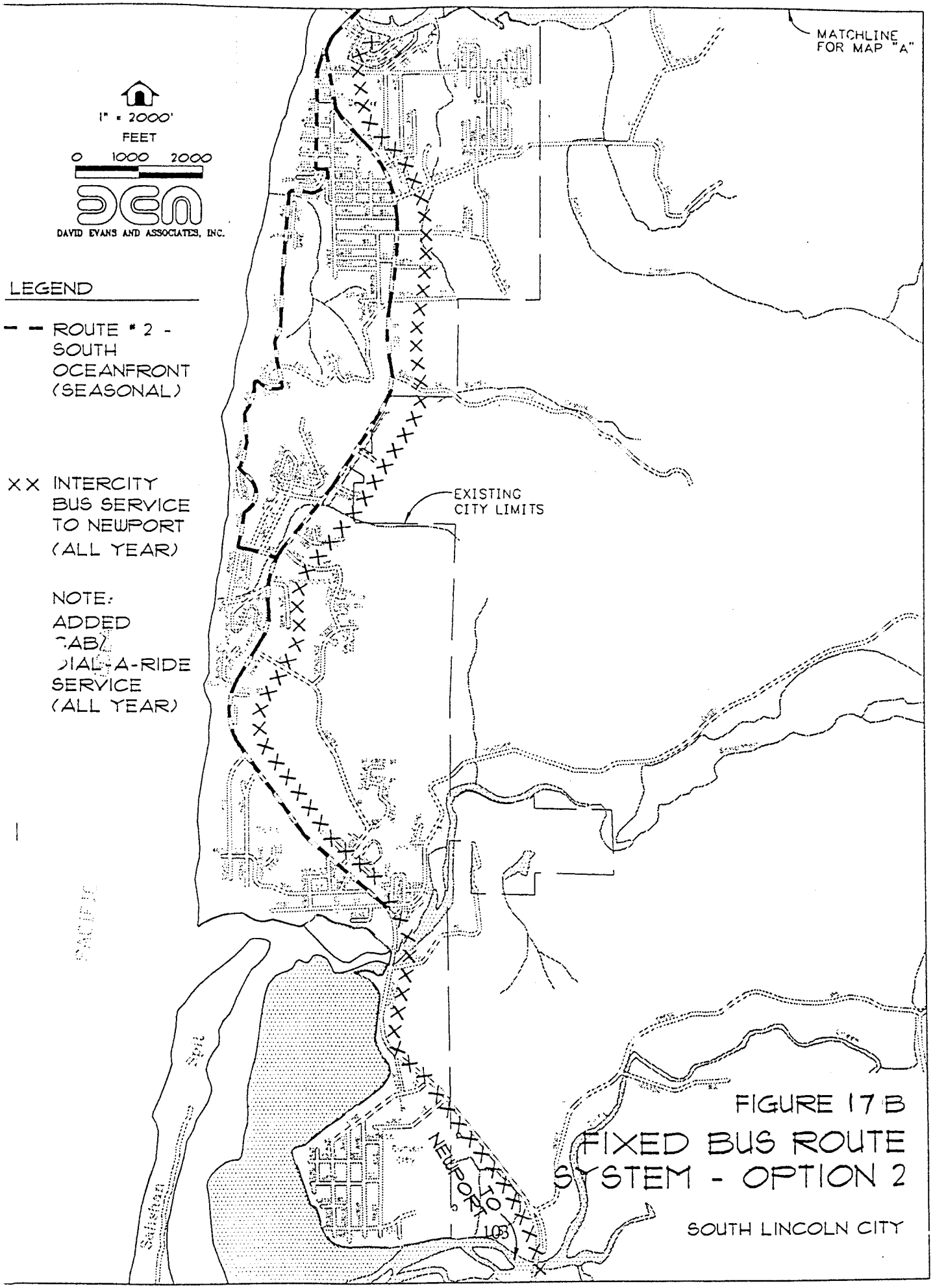


FIGURE 17 B

FIXED BUS ROUTE SYSTEM - OPTION 2

SOUTH LINCOLN CITY

<<<<<<<<<<<<<<<<<<<< C H A P T E R 9 >>>>>>>>>>>>>>>>>>>>

TRANSPORTATION PLAN

The Transportation Master Plan includes functional street classification and street width standards, reasonable and prudent policies that deal with maximizing roadway function and intersection congestion, bicycle and pedestrian facilities, a public transit plan, and a discussion of transportation demand management strategies.

For all of the facility and service improvements which are indicated, overall priorities in implementation were identified. The top priority improvements were then incorporated into an updated Capital Improvement Progam for transportation investment in Lincoln City, as presented in Chapter 10 - IMPLEMENTATION.

In the Conclusions in the Roadway System Alternatives Chapter (5), the preferred alternative for the Transportation Plan improvements is stated as Alternative 1: "Highway 101 Widening to 4 - 5 Lanes". All available data supports this alternative, and the improvements cited in this Transportation Master Plan are based on it.

Since a bypass--which has long been the community's number one request for relief from high volumes of through-town traffic--would be outside the city's Urban Growth Boundary, since it would require exceptions to LCDC planning goals, since it would conflict with State Goals 4, 11, 12 and 14, and since it would be outside the scope (horizon) of this Plan, it would appear that further discussion of the bypass would be inappropriate in this Plan.

However, all studies, projections and events point to the fact that even if the Hwy 101 roadway is maximized (as this Plan requires), it would appear that the construction of an alternate roadway (a bypass) --with *additional capacity* to carry future volumes of traffic around Lincoln City--must constitute a near-term priority for the state.

STREET FUNCTIONAL CLASSIFICATION STANDARDS

Street design standards are needed to guide the construction of new roadways and improvements to existing roadways in a community. These standards (right-of-way width, pavement width, presence of sidewalks and/or bike lanes, etc.) are related to *street functions*. *Street functional classifications* also relate to *operational characteristics* (traffic volume, operating speed, safety and capacity).

Although this Plan takes serious and constructive note of the state's classification standards, this Plan primarily conforms to the *Subdivision Ordinance for Lincoln City [OR 78-32]*. The *American Public Works Association Standards (Or. Chapter - 1990)*, including the *Supplemental Standards for L.C.* adopted by Resolution 84-09, contains specifications for new construction and reconstruction. The publication, *Residential Streets* (by the American Society of Civil Engineers, the National Association of Home Builders, and the Urban Land Institute), contains flexible guidelines which are here

recommended for design considerations. Excerpts from these referenced documents will be found in Appendix E.

The David Evans fold-out cross-section drawing of the state's Street Design Standards is included in Appendix X, for comparison purposes and for optional use as described in Chapter 1 (under "Relationship to Other Planning Efforts").

Five categories of streets have been identified in Lincoln City. They will be referred to with some flexibility as:

- Local street;
- Minor collector;
- Major collector;
- Minor or Secondary arterial; and
- Principal or Primary arterial

The *Residential Streets* document refers to the street classifications in ascending order as "Access Streets", "Subcollector", "Collectors", and "Arterials". The hierarchy is similar to those listed above.

The street classification categories suggested here are generally consistent with or similar to the classifications used by ODOT in indicating the Federal Aid Urban street system in the city. The percentage distribution between local, collectors, and minor and principal arterial streets in Lincoln City is fairly consistent with the Federal Highway Administration classification guidelines. In Lincoln City, 80% of the streets are designated local streets, nearly 10% are collectors, 5% are minor arterials, with Hwy 101 (the sole major arterial) at 5%.

Local Streets

Local streets (also known as local "access" streets) are intended to serve abutting properties without carrying through-traffic. These streets are designed to carry less than 1,200 vehicles per day. If the forecast exceeds 1,200 per day, as determined in the design stage, the street system configuration should either be changed to reduce the forecast volume, or the street shoud be re-designed as a collector. Local streets should extend for only a few blocks to maintain a low traffic volume and to minimize the potential for through-traffic.

On low-volume residential streets, where curb parking might occur on both sides of the street, one lane of traffic will move freely. This condition has been found acceptable in residential areas where curb parking does not extend for great distances. The level of residential inconvenience occasioned by the lack of two moving lanes is very low.

Optimally, local residential streets should be designed so they are only several blocks (approximately 1,500 feet) in length. These kinds of local streets should not be upgraded to function as collector streets. Adequate driveway depth or garage setbacks should be required to assure room for parking.

Minor Collector Streets

Minor collectors (also known as "sub-collectors") are primarily

intended to serve abutting property and local-access needs of neighborhoods, including limited through-traffic. Developments likely to generate a high traffic volume should be discouraged from locating on minor collectors that also serve residential districts.

Designated minor collector streets in Lincoln City include:

- N.W. 26th St.;
- N.E. 21st St. (east of Hwy 101);
- N.E. Mast Ave/N.E. 11th St./N. Oar Pl. (between N. 6th Dr. and N. 22nd St.;
- N.W. 14th Ave (west of Hwy 101);
- N. 6th Dr.;
- S.E. 3rd St.;
- S.E. Port Ave.;
- S.W. 12th St. (west of Hwy 101);
- S.W. Coast Ave between S.W. 11th Dr. & S.W. Bard/S.W. 24th St.;
- S.W. Anchor Ave. (between S.W. Bard Rd. and S.W. 32nd St.);
- S.W. 50th St./S.W. Coast Ave. (Taft district);
- S.W. 51st St.;
- S.W. 62nd St; and
- S.W. 63rd St.

A new collector (with bikeways) is shown in Fig 18 A, joining N.E. Devils Lake Blvd. and Logan Rd. north of Hwy 101, to serve future development in that area.

Major Collector Streets

Major collectors are intended to move traffic from local streets or minor collectors (streets which have less traffic and less potential for heavy future traffic) to arterials. _Major collectors are intended to carry from 1,500 to 10,000 vehicle trips per day.

Designated major collector streets in Lincoln City include:

- N.W. Logan Rd;
- N.W. 39th St.;
- N.E. Holmes Rd./N.W. 30th St.;
- N.W. 21st ST. (west of Hwy 101)/N.E. 22nd St. (east of Hwy 101);
- N.W. Jetty Ave. (between N.W. 21st and N.W. 39th Streets);
- N.W. Inlet Ave/N.W. Harbor (between N.W. 6th Dr. and N.W. 21st St.);
- S.W. Ebb Ave;
- S.W. 32nd St.;
- S.E. Fleet Ave./S.E. Spyglass Ridge Rd./S.E. High School Dr./S.E. 48th Pl. (between S.E. 32nd Dr. and Hwy 101); and
- Schooner Creek Rd.

Minor Arterials

Minor (or "secondary") arterial streets are intended to provide for the fluid movement of traffic between areas and across portions of a city, with priority given to through-traffic. Because of relatively h

high traffic volumes, parking should be discouraged on minor arterials.

Two roadways are designated as secondary arterials in Lincoln City:

1) East Devils Lake Road, and
2) West Devils Lake Road.

Principal or Primary Arterials

Primary arterial streets are intended to serve as the principal route for travel between major urban activity centers.

In Lincoln City the only designated primary arterial is Hwy 101. As stated earlier, bicycle lanes through the congested/downtown sections of Lincoln City should be relocated to collectors and secondary/minor arterials.

STREET IMPROVEMENTS

Several modifications to the street system in Lincoln City are incorporated into the Transporation Master Plan. Major capacity improvements relate to widening Hwy 101 to 4-5 lanes. Most other arterial and collector street improvements involve shoulder widening, realignment, and sidewalk and bike lane improvements to enhance traffic safety and, where possible, to increase capacity. The recommended staging of improvements to arterial and collector streets is described in Chapter 10 - "Implementation Program".

Arterials

Highway 101

The completion of widening Hwy 101 to 4-5 lanes requires widening in the following sections to provide **four travel lanes** with a left-turn lane where neceessary:

From Hwy 18 to N.W. 26th St.
From S. 19th to S.W. Beach Ave.
From S.W. 52nd Court to the south city limits

Beginning at the north city limits, subsidiary improvement strategies would occur, including:

traffic signals (removal/addition),
on-street parking removal,
center left-turn lane development,
bicycle lane relocation,
side street modifications, and
sidewalk development.

A posted speed of 35 MPH is appropriate for the through town primary arterial.

East Devils Lake Road

A segment of East Devils Lake Rd. at its south terminus (from Hwy 101 to S. Port Ave.) would be widened to provide **four travel lanes plus a center left-turn** lane. This improvement would facilitate access to the Factory Stores at Lincoln City shopping center, the Post Office, future residential areas, and the City Police and Public Works Departments. The balance of East Devils Lake Rd., from S. Port to its north terminus at Hwy 101 (via the corridor east of Devils Lake), would have shoulders widened for bike lanes and road realignment. (See the Kittelson & Associates Report)

East Side Scenic Byway/Bypass

Although the community has long been committed to a Lincoln City Bypass, and although the data support the need, the city recognizes that **state** must identify the need for an alternate roadway corridor which, when built, will increase the **state highwy system capacity.** This has been recognized as a priority project for the state to meet its long-range goals, and Lincoln City wants to be helpful toward that end.

The city recognizes that cooperative efforts between the state and its citizens are crucial when dealing with shared problems. Therefore, the city will lead in the formation of a **regional task force** to study, evaluate and implement a process (local, regional, state and/or national)--through alliances, organizations, and measures--to aid the state in achieving this necessary alternate state highway on the east side of Devils Lake.

Collectors

North Side Ocean Front Collector

In north Lincoln City, shoulder widening on existing streets along N.W. Inlet Ave. (between N.W. 6th Dr. and N.W. 12th St.), and along N.W. Harbor (between N.W. 12th St. and N.W. 21st St.), are needed to allow these street segments to operate as part of an overall ocean front collector system between N.W. 6th Dr and N.W. 39th St. It would require using N.W. Jetty Ave (north of N.W. 21st St.), and includes intersection realignment on N.W. Harbor Ave. at N.W. 15th and N.W. 21st Streets.

South Side Ocean Front Collector

Shoulder widening and minor road realignment along S.W. Ebb, S.W. 11th St., S.W. Coast, and S.W. Anchor Ave. between S. 32nd St. and Hwy 101 would be required to develop an improved ocean front collector on the south side of Lincoln City.

S. W. Coast Avenue Extension

Because of physical constraints S.W. Coast Ave. will remain a de facto **minor** collector. However, the roadway should be extended south of S.W. 24th Dr. to S.W. 32nd St. as a **two-lane street** associated with new development in that area. Sidewalks and bike lanes may be a

possibility on this extension, where they are not feasible on the built-out section.

S.E. Inlet Avenue Extension

S.E. Inlet Ave. should be extended north of S.E. 48th Pl. to intersect with S.E. High School Drive. This should be a **two-lane street** with bike lanes and sidewalks. S.E. Inlet Ave. south of S.E. 48th Pl. should also be widened to provide some parking for the on-street parking which will be removed from Hwy 101 in the Taft district.

S.W. Galley Avenue/S.E. 48th Place Connection

At Hwy 101, S.E. 48th Pl. should be realigned to the south to meet S.W. Galley Ave., with a traffic signal installed at the Hwy 101 intersection. S.E. 48th Pl. should also be extended as a **two-lane roadway** between S.E. High School Dr. and Schooner Creek Road.

STREET LIGHTING

Pacific Power has developed a set of detailed maps (1" - 200' scale) indicating where new or improved street lighting is warranted on the Lincoln City street system. These maps represent the street lighting facility component of the Transportation Master Plan. The plan includes the following components:

1. All existing, antiquated vertical-type mercury vapor street lights be removed;
2. Existing horizontal mercury vapor and high pressure sodium vapor street lights which are in proper locations should be retained. (In the future, however, when defects occur, all mercury vapor units should be replaced with high-pressure sodium vapor units); and
3. High pressure sodium vapor street lights should be installed in all cases where illumination is recommended for new locations, or where unit replacements are necessary to achieve higher lighting levels.

The proposed system will increase lighting levels by as much as 1/3 over present levels. Still at issue is "who pays for the cost of the system improvements?" The preliminary plan, where Pacific Power would own, operate and maintain the recommended street lights, is estimated to cost $136,300 per year.

BICYCLE FACILITIES

Three reasons why Lincoln City should have quality bicycle facilities: 1. Bicycling is the fastest-growing physical fitness sport in America; 2. Oregon is one of the most popular states in the nation for recreational bicycle touring; and, 3. the Oregon Coast Bike Route, which passes through Lincoln City on its way from Astoria to Brookings, is one of the most used. It should be adequately signed. The Coast Route has received priority treatment in the past, and the city shares the state's view that improving the safety of bicycle routes is a worthy goal.

Bikeway facilities are divided into 4 categories: **shared** roadway (motorists and cyclists compete for roadway--best used where there is minimal auto traffic); **shoulder** (common in rural areas--few vehicle conflicts); bike **lanes** (designated/painted lanes for exclusive bicycle use); and, bike **paths** (minimum of 5 feet separation from roadway).

Safe bicycle and pedestrian facilities should be easily identified on all streets where there is a potential for conflicts with motor vehicles--in particular the major collector and arterial streets, which exhibit higher volumes and speeds than local and minor collectors.

The 3 classifications in the 1987 bicycle plan are: 1) routes with bike lanes within the roadway; 2) routes which are shared roadways and only signed; and, 3) recreational-ride routes. This Master Plan modifies the bicycle route structure initially proposed in the **1987 Lincoln City Bicycle Master Plan** to limit designated bicycle routes to collector and (principally) minor arterial streets. Although the system utilizes the Hwy 101 roadway minimally, it connects all major activity centers in the city including the commercial areas, schools, hospital, parks, Community Center, and beach access locations.

A description of each proposed Lincoln City bicycle route follows with its official category in **bold** print:

Route 1. Roads End Park Route - would extend along N.W. Logan Rd from Hwy 101 to the Roads End Wayside. The route is recommended to be a **striped bike lane.**

Route 2. North Coast Line Loop - would serve bicycle touring and several beach access locations and residentail areas. The route would be a **shared roadway** following N.W. Jetty, N.W. Harbor and N.W. Inlet Ave., between N.W. 39th and N.W. 3rd streets. Added east-west spurs of the route would extend along N. 30th, N. 21st St., and N. 14th to provide access to points through town.

Route 3. Hwy 101 - Through the Oceanlake, Delake and Taft commercial areas, with their left-turn lanes and right-on/right-off only treatments, bicycles have the potential to seriously impact the flow of traffic and could not safely be accomodated. Route 3 would enter town as a **striped bike lane** segment of the State Bicycle Route System. The treatment for this facility will be dependent on the implementation of the widening alternative. Bicycles could be routed away from Hwy 101 to the North Coast Line Loop (Route 2 above) via N.W. 39thSt. After returning to Hwy 101 (via N.W. 2nd Dr.) and crossing the D River Bridge, the bike route would divert again on S.W. Ebb to the South Coast Line Loop. (Route 8)

Route 4. Holmes Road /30th Street Connector - would connect West Devils Lake Road with Hwy 101, providing access to Holmes Road Park. The route is recommended to be a **striped bike lane.**

Route 5. West Devils Lake Loop - would extend along the entire length of West Devils Lake Rd. Widening of this road will be required (to two 12-foot travel lanes and two 5-foot bike lanes) for a **striped bike lane** to be achievable.

Route 6. North 21st/22nd Connector - would serve as a second connector between West Devils Lake Rd. and Hwy 101, also serving the city pool and Oceanlake Elementary School. (Initially that section of N. 21st between Hwy 101 and N. Surf Ave. should have **striped lanes**; when N. 22nd is widened, this section should also be **striped** as a designated bike lane.)

Route 7. East Devils Lake Loop - would serve as a scenic bike-bypass route. Given the arterial classification of this road, it is recommended that widening be effected allowing **striped and signed bike lanes** to be added.

Route 8. South Coast Line Loop - would serve bicycle touring and several beach access locations and residential areas, and would follow S. Coast and S. Anchor Avenues. Currently, given the narrowness of these streets, this route is recommended for implementation as a **shared roadway.**

Route 9. High School Loop - would serve Taft High School and the residential area east of Hwy 101. This is proposed as a **signed route** only, due to low traffic volumes along this route and the difficulty of removing on-street parking to provide a striped bike lane.

Route 10. High School Connector - would be a short connector between Hwy 101 and the High School Loop on a **shared roadway.**

Route 11. Taft Loop - would serve the Siletz Bay Wayside and the residential and commercial areas west of Hwy 101 using S.W. 50th street and S.W. Coast Ave. on a **shared roadway.**

Route 12. Cutler City Loop - would serve the Cutler City residential area, following S.W. 62nd St., S.W. Fleet Ave., S.W. 69th St., S.W. Inlet Ave., and S.W. 63rd St. on a **shared roadway.**

Route 13. Drift Creek/Schooner Creek Scenic Route - would be for bicycle touring, and would not have any special bike route signing.

PEDESTRIAN FACILITIES

Fig 19 identifies the pedestrian facility plan for Lincoln City. The plan includes three components:

1. Streets requiring added sidewalk development,
2. Retrofitting existing sidewalks with wheelchair-accessible curbing as sidewalk repair is performed, and

3. Pedestrian access to beach locations, including ramp treatments to accommodate handicapped individuals.

Sidewalk development is divided into four priorities:

Priority 1 - would involve adding sidewalks on one or both sides of designated **arterials streets in developed areas** where there are currently no sidewalks: Hwy 101, West Devils Lake Road, East Devils Lake Road west of S.E. Port Ave..

Priority 2 - in accordance with the federal *Americans with Disabilities Act*, an inventory would be made of sidewalks needing **ramp curbing** facilitating wheel chair use at crosswalks.

Priority 3 - would add sidewalks to one or both sides of **collector** streets in already developed areas (i.e. East Devils Lake Road).

Priority 4 - would add sidewalks to one or both sides of **arterial streets in undeveloped areas** (i.e., East Devils Lake Rd.).

Sidewalks should conform to the APWA Supplemental Standards for Lincoln City.

Pedestrian access to the beaches at the current beach access locations needs to be improved for the elderly and handicapped. In addition, bike safe-storage facilities at all beach access locations would be desirable.

PUBLIC TRANSPORTATION

The public transit feasibility analysis concluded that a limited fixed-route bus service during the summer months (Memorial Day to Labor Day) has potential and should be evaluated in further detail in a follow-up Transit Development Program (TDP) study. This study would further evaluate service and administrative alternatives, and develop a final transit plan. The limited fixed-route service option appears to be the most economical as it is focused on serving tourists and seasonal residents during the summer peak period. An expanded Dial-A-Ride operation might then be developed to handle off-peak-month travel demands. This strategy would also have the least impact on the existing Dial-A-Ride, cab and intercity bus operations, and would best complement these services.

OFF-STREET PARKING

Future Parking Demand

The 1988 Lincoln City Urban Renewal Plan indicated a future demand for about 1,200 added parking spaces in the Hwy 101 corridor and at the beach assess locations. When Hwy 101 is widened to 4-5 lanes through the city, it is projected that an additional 1,500 off-street parking spaces would be required.

The success of both the short term and the capacity improvements to Hwy 101 is contingent on the availablility of sufficient off-street parking spaces so that removal of on-street parking can occur and Hwy 101 roadway improvements can be made in timely fashion.

Added Off-Street Parking Opportunities

Proposed off-street parking development is shown in Fig 20. Five potential off-street parking locations (identified in the 1988 Urban Renewal Plan) plus three additional facilities are shown. These

facilities would add about 800 off-street parking spaces in Lincoln City.

The off-street parking sites identified in the 1988 Urban Renewal Plan--which total 532 potential spaces--include:

- N.E. 12/13th Sts., east of Hwy 101 (surface lots) - **68 spaces**
- N.W. 15th/16th Sts., west of Hwy 101 (surface lot) - **92 spaces**
- N.W. 17th/18th Sts., west of Hwy 101 (planeed 2-level structure) **142 total spaces**, surface lot portion completed
- S.W. 50th/51st St., west of Hwy 101 (surface lot) - **80 spaces**
- S.E. Inlet Ave., between S.E. Jetty Ave. and S.E. 48th Pl. (surface lot) - **150 spaces**

In addition, the city has plans for a **20-space** facility at S.W. 32nd, west of Hwy 101.

All of these parking lots provide suitable off-street parking for the Oceanlake Delake and/or Taft commercial areas. They abut designated collector or arterial streets, with access to nearby signalized intersections along Hwy 101. The S.W. 50th St. location supplements existing parking at the Siltez Bay Wayside.

Based on field survey, three potential sites for off-street parking development along the Hwy 101 corridor have been identified. All of these sites have direct access to designated collector streets and would accomodate 160 vehicles. They are:

1. East side of Hwy 101 north of N.E. 1st St. - 1.1 acres (**110 spaces**)
2. N.E. 15th St. and N.E. Lee Pl. (northwest corner, City Shop site) - 0.5 acre (**50 spaces**)

Limited parking is currently provided at four of the existing beach access locations: S.W. 33th St., S.W. 11th St., N.W. 21st St., N.W. 26th St., N.W. 35th St., and N.W. 40th St. There appears to be little or no opportunity for additional parking at these locations.

The present severe shortage of off-street parking spaces connotes the importance of identifying potential sites that may become available for acquisition by the city in the near future.

HIGHWAY 101 TRAFFIC AND ACCESS MANAGEMENT

Strategies for traffic and access management along the highway through the city have been conceptualized. Table 9 at the end of this chapter identifies a set of acceptable management policies.

This Plan includes the following strategies:

- Arterial/collector street intersections;
- Signal locations;
- On-street parking removal;
- Center left-turn development;
- Right-on/right-off movement at specified low-volume intersections;
- Local driveway consolidation;
- Pedestrian crosswalk definition;
- Sidewalk development; and
- Guide sign improvements.

A description of each strategy follows.

Arterial/Collector Street Intersections

The in-town function of arterial and collector streets is to conduct traffic between residential areas and activity centers. **Full movement access** should be considered at the intersections of these streets with Highway 101. The following streets are recommended for Arterial/Collector Street classification (from north to south):

- East Devils Lake Road (north end);
- N.W. Logan Road;
- N.W. 39th Street;
- N.E. Holmes Road/N.E. 30th Street;
- N.W. 26th Street;
- N.W. 21st Street (west of Hwy 101; N.E. 22nd Street east of Hwy 101);
- N.W. 14th Street/West Devils Lake Road;
- N. 6th Drive;
- S.E. 1st Street;
- S.E. 3rd Street;
- S.W. 12th Street/ East Devils Lake Road (south end);
- S. 32nd Street;
- S.W. Coast Avenue; (south of Taft cemetery)
- S.E. 48th Place;
- S. 51st Street;
- S.W. 62nd Street; and
- S.W. 63rd Street.

These streets function to channel traffic from local neighborhoods to Hwy 101, keeping through-traffic off of local streets as much as possible.

Signal Locations

Full movement access should be provided at all vehicular **signalized** intersections. Traffic signals along Hwy 101, located at arterial/collector street intersections will make these routes more attractive for neighborhood traffic accessing Hwy 101.

Signals should be limited to the following intersections along Hwy 101:

Existing

- West Devils Lake Road;
- Logan Road;
- N. 22nd Street;
- N. 14th Street;
- N. 6th Street'
- S. 1st Street;
- S. 8th Street;
- East Devils Lake Road/S.W. 12th Street;
- S. 51st Street;

Future - When Warranted

- East Devils Lake Road (north end)
- N.E. Holmes Road (when aligned with N.W. 30th Street)
- N. 17th St. (when signal removed from N. 22nd St.)
- S. 32nd Street; and
- S.E. 48th Place (when realigned with S.W. Galley Ave. and extended to Schooner Creek Road)

The existing signal at the N. 21st Street intersection should be removed because the intersection is not aligned and requires a different treatment, and there is already a signal at 22nd St. N.W. Mast Pl. on the west side of Hwy 101 (between N.E. 22nd and N.W. 21st streets) should be designated as a collector street. It would carry east-bound traffic on N.W. 21st to the Hwy 101 intersection at N.22nd.

Further analysis will be required before a final overall signal plan for Hwy 101 is implemented. In particular, this will require conducting corridor operations analyses to identify the impact of new traffic signals on overall vehicle progression along Hwy 101. This analysis should be incorporated when an intersection meets volume and/or accident warrants for signalization.

On-Street Parking Removal

On-street parking exists at two areas along Hwy 101:

- between N. 22 and N. 12th Streets in the Oceanlake district,
- between S.E. 48th Place and S.W. 52nd Court in the Taft district.

This curb parking creates conflicts with through traffic and ties up roadway that could be better utilized as travel lanes. However, off-street parking facilities must be on-line **prior** to removing on-street parking, and, ideally, they should be accessed from collector streets intersecting Hwy 101.

Center Left Turn Development

Removal of parking in the Oceanlake, Delake and Taft districts will create the opportunity to develop a center left-turn lane treatment at N. 22nd-N. 12th Streets, and at S.E. 48th Place-S.W. 52nd Court. **Dedicated** left-turn lane should be developed at S. 51st St. intersections, with a two-way left-turn lane treatment at the other intersections..

When other sections of the Hwy 101 corridor are widened to provide five lanes, a center left-turn lane treatment should be developed in those areas with closely spaced side street intersections. This would include the portion of Hwy 101 between N.W. Logan Rd and N. 22nd St., and between S. 14th and S. 19th Streets.

In the other segments of the Hwy 101 corridor which would be widened, left-turn lanes should be developed at principal intersections (major collectors and minor arterials) and essential private driveways (if relegating these driveway accesses to local streets is not possible), and where the accessing street gathers considerable off-Hwy 101 traffic (a housing development, offices, production facility, country club, church, etc.). These Hwy 101 segments include: from the Hwy 18 interchange to N.W. Logan Rd.; from S. 19th St. to S.E. 48th Pl.; and from S.W. 62nd to S.W. 63rd Streets. Existing intersections where left turn lanes would presently be desirable include:

- Neotsu Drive;
- S.W. Bard Road;
- S.E. 23rd Drive;
- S. 32nd Street;
- S.W. Beach Avenue;
- S.W. Coast Avenue;
- S.W. 63rd Street.

In all cases discussed above, when the left-turn lane has performed its function, it either merges back into the travel lane or remains a fifth lane as it travels through the area--an "Emergency Lane"--painted typically (zebra-striped)--to indicate that it is neither a left-turn lane nor a travel lane.

Right On/Right Off Treatment at Local Street/Hwy 101 Intersections

There are cetain local streets intersecting Hwy 101 with low traffic volumes (less than 200 vehciles a day) which should be considered for conversion to "right-on/right-off" only access. Most of these streets are convenient to collector or local streets where left turn movements would be allowed. Most of the existing intersections where this treatment should be considered are "T" intersections. Other streets for consideration should include: N.W. 33rd, N.W. 20th, N.W. 18th, N.W. 16th, S.E. 16th, S.E. 28th, S.W. 35th, S.W. 38th and S.E. 39th Streets.

For the side street approaches to the Hwy 101 intersection, signage ("Right Turn Only) and curved double stripes painted on the pavement would indicate the "right-on/right-off" control.

Local Driveway Consolidation

There are several locations along Hwy 101 where existing driveways could be consolidated, modified, or closed to reduce traffic conflicts and improve safety without reducing property access. The following improvements would be helpful:

- Consolidate driveway access on west side of Hwy 101 south of N.E. 11th Street (Premier/At'sa Pizza);

- Same location (businesses north of Premier);
- Consolidate access by installing curbing on west side of Hwy 101 between S.W. Fleet Drive/S.W. Galley Avenue/3rd St. triangle (Risberg Trucking).
- Reconfigure access to businesses on west side of Hwy 101 between S.W. 32nd and S.W. 35th Streets (Nelscott); and
- Channelize access into and out of Siletz Bay Park, using yellow-double-stripe or curbing treatment.

Frontage Road Development

In certain existing developed sections of the Hwy 101 corridor, there are opportunities to develop frontage roads in front of businesses or improve parallel streets behind the highway frontage to consolidate access to the highway and provide access to off-street parking opportunities. Two locations in particular have been identified as possibilities:

- Extension of frontage road on west side of Hwy 101 south of S.W. 32nd Street to S.W. 35th Place (Nelscott); and
- Provision of on-street parking on S.E. Inlet Avenue in the vicinity of S.E. 48th Place (the Taft Parkade).

Frontage roads could also be developed in currently undeveloped areas along Hwy 101 for use when development occurs in those areas. These roads could serve to channel access to local developments through one Hwy 101 intersection. After widening Hwy 101, a look at developing frontage roads in these area might be useful:

- North of N.W. Logan Road; and
- Between S.E. 23rd Drive and S. 32nd Street ("No Man's Land").

Sidewalk Development

FOr safety, pedestrian traffic should be separated from vehicular traffic on those streets with significant vehicular volume. A range of options are available for local streets. On low-traffic streets (such as cul-de-sacs) the street itself often fulfills the function of a side-walk. (See *Subdivision Ordinance for L.C.* and *Residential Streets.*) On arterials, pedestrians enjoy greater safety if there is a planting strip between the street and the sidewalk. Provision of sidewalks in the following areas of Hwy 101 will reduce conflicts between pedestrians and vehicles:

- Between N. 36th and N.34th Streets;
- Between N. 6th Drive and S.E. Ebb Avenue; and
- Between S.W. Fleet Avenue and S.E. 63rd Street.

Sidewalk improvements, if needed, should be included in any Hwy 101 widening project.

Guide Sign Improvements

Guide sign improvements along Hwy 101 are desirable to provide sufficient information to motorists to lead them to destinations off

the highway. This signing will help to reduce traffic circulating through neighborhoods trying to find certain destinations. In particular, guide signing of beach access points at the intersections of N.W. 40th, N.W. 36th , N. 14th and S. 51st Streets, and at off-street parking lots.

NEIGHBORHOOD TRAFFIC MANAGEMENT

With an increase in traffic projected on the arterial system, there is always a potential for diversion of through-traffic onto the collector and local street system. Several techniques may be evaluated for the purpose of minimizing this possibility.

A process for Oregon City'S PROGRAM (patterned after Portland's "Neighborhood Traffic Management Program") is discussed in the Monitoring Program section of the report which will be found in Appendix X. State Policies and Tables relative to access management will be found in Appendix X. They are an informational resource.

TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) techniques, applied during the peak travel hours, might someday alleviate work-force generated traffic congestion and provide more efficiency in the transportation system. Techniques which have been successful in larger cities include carpooling and vanpooling, alternative work schedules, working at home, high-density development along transit routes, and bicycle/pedestrian facilities, and programs focused on high-density employment areas.

Carpooling and Vanpooling

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

Alternative Work Schedules

Alternative work schedules (such as *flex-time* or *staggered work hours*), especially with large employers in larger cities, can help spread the peak period traffic volumes over a longer time period, thus providing better service out of a fixed capacity roadway. Many industrial employers already have work schedules which are earlier than the norm. This innovative scheduling should be encouraged when new industries establish in the area.

Transit and Bicycle/Pedestrian Facilities

Transit and bicycle/pedestrian use can be encouraged by implementing strategies discussed earlier. Secure bicycle parking, showers and locker facilities would help to encourage bicycle commuting and

walking to work. In addition, where possible transit use can be encouraged with fare subsidies and by providing convenient access to transit facilities.

Working At Home

Advances in telecommunicating technology have enabled a portion of the work force to work at home using home comupters, fax modems, etc. This is likely to increase over the next several decades. By the year 2015, if that trend continues, an additional 7.4 percent of the work force could possibly stay home and work. Peak hour trips might be reduced by 100.

High Density Employment Areas

Transportation Demand Management (TDM) programs work best in areas of high density employment, and they are most successful when applied to firms with more than 50 employees. As the city grows, it can work toward implementation of TDM strategies through coordination with new employers moving in to Lincoln City. Successful implementation requires public support, industry involvement, quantifiable goals, and incentives.

TABLE 9
HIGHWAY 101 TRAFFIC MANAGEMENT POLICIES

1. Implement a street functional classification plan for Lincoln City that limits access to neighborhoods off Hwy 101 as much as possible to properly spaced collector streets.

2. Provide vehicular traffic signals mainly at collector/arterial street intersections with Hwy 101.

3. Remove on-street parking in the Oceanlake, Delake and Taft districts and develop a center left turn lane treatment from the five lanes created in those areas.

4. Restrict traffic movement at certain low volume street approaches to Hwy 101 to right-on/right off.

5. Consolidate local driveway access where possible (on a case-by-case basis) and when private property improvements occur in developed areas.

7. Develop a plan (for the current undeveloped or underdeveloped segments of Hwy 101) which would guide the development of highway access plans for site-specific development proposals in those areas.

8. Develop sidewalks along those segments of Hwy 101 that currently have none when making improvements to the highway.

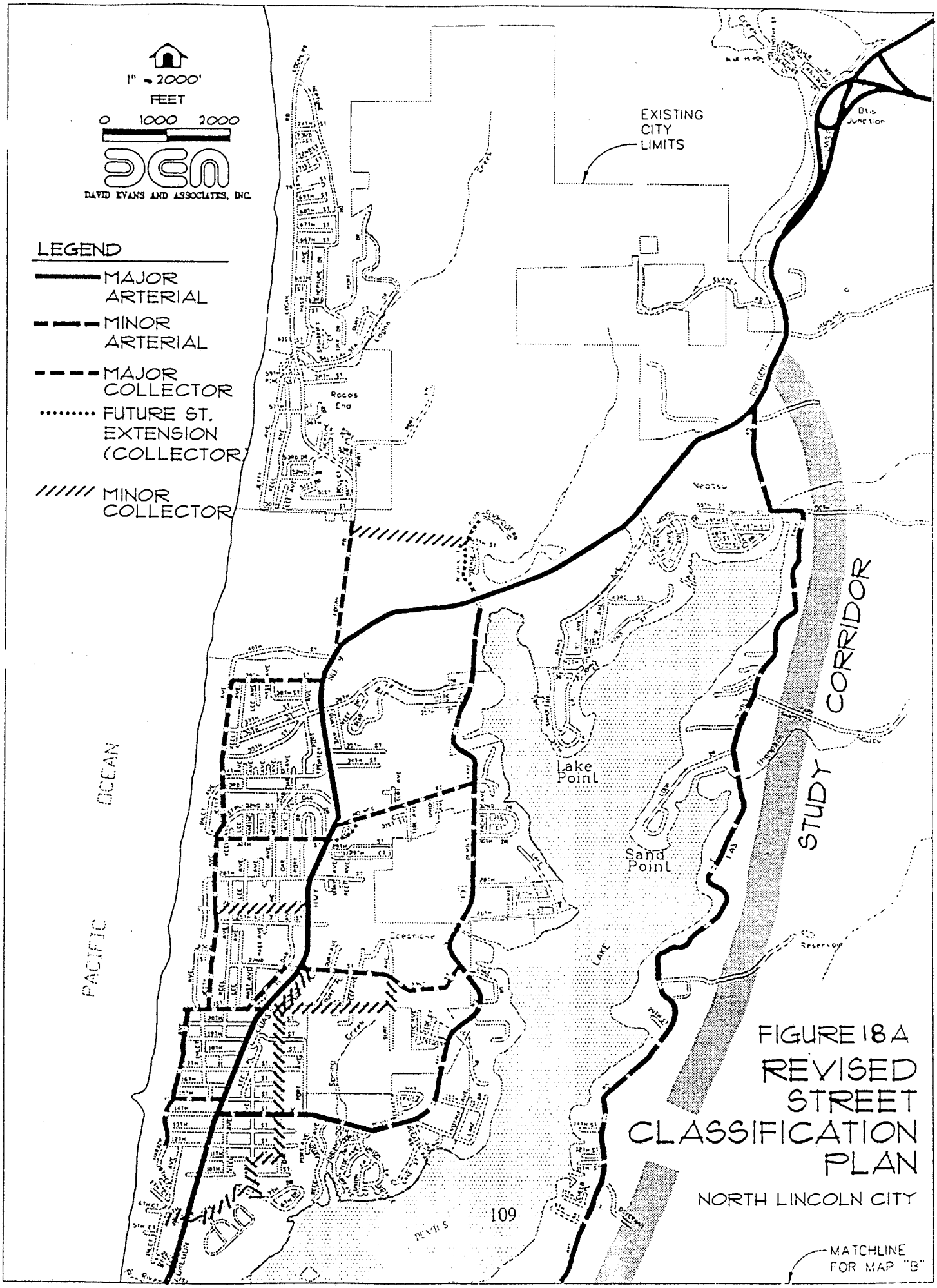


FIGURE 18A
REVISED STREET CLASSIFICATION PLAN
NORTH LINCOLN CITY

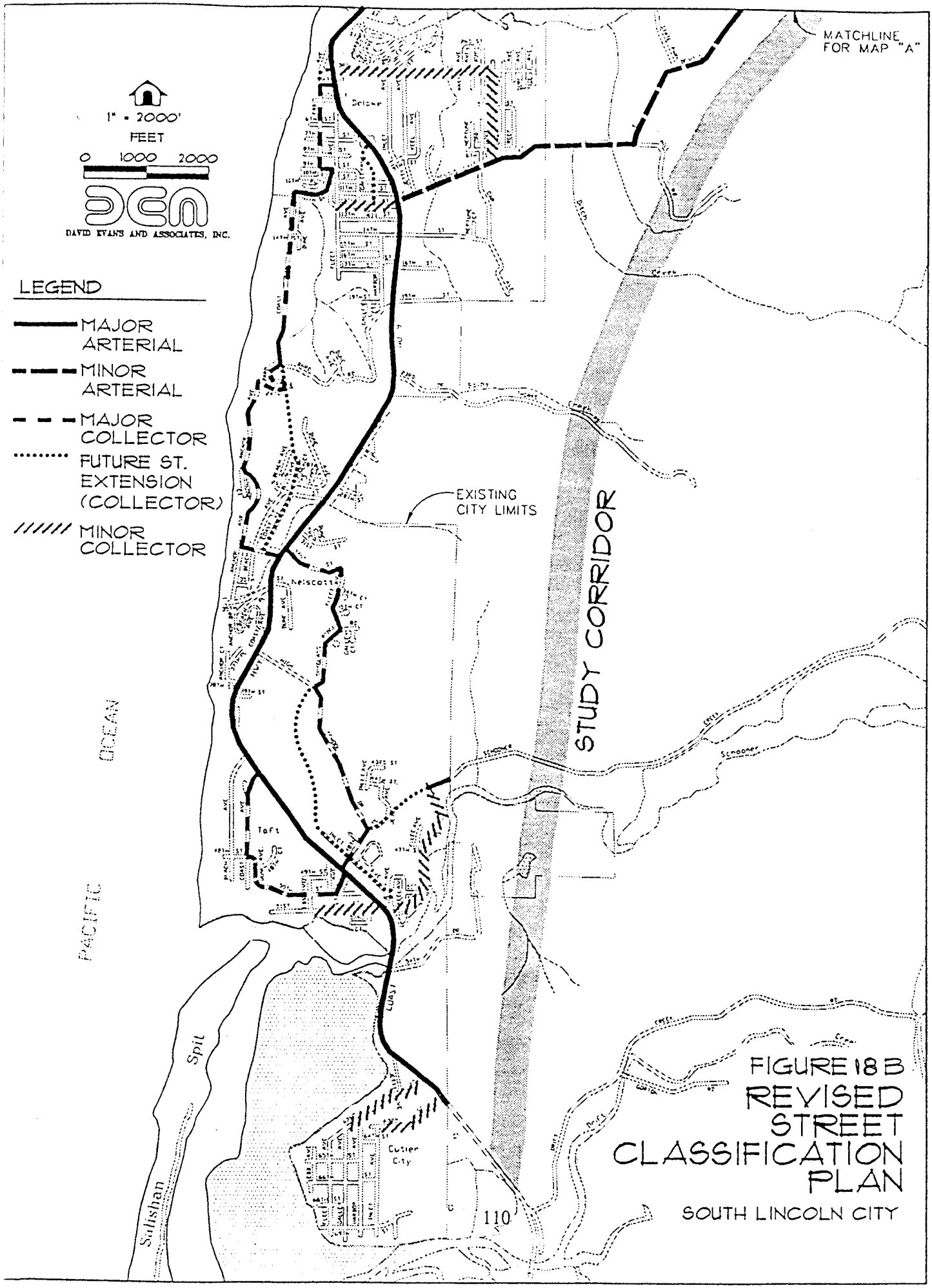


FIGURE 18 B
REVISED STREET CLASSIFICATION PLAN
SOUTH LINCOLN CITY

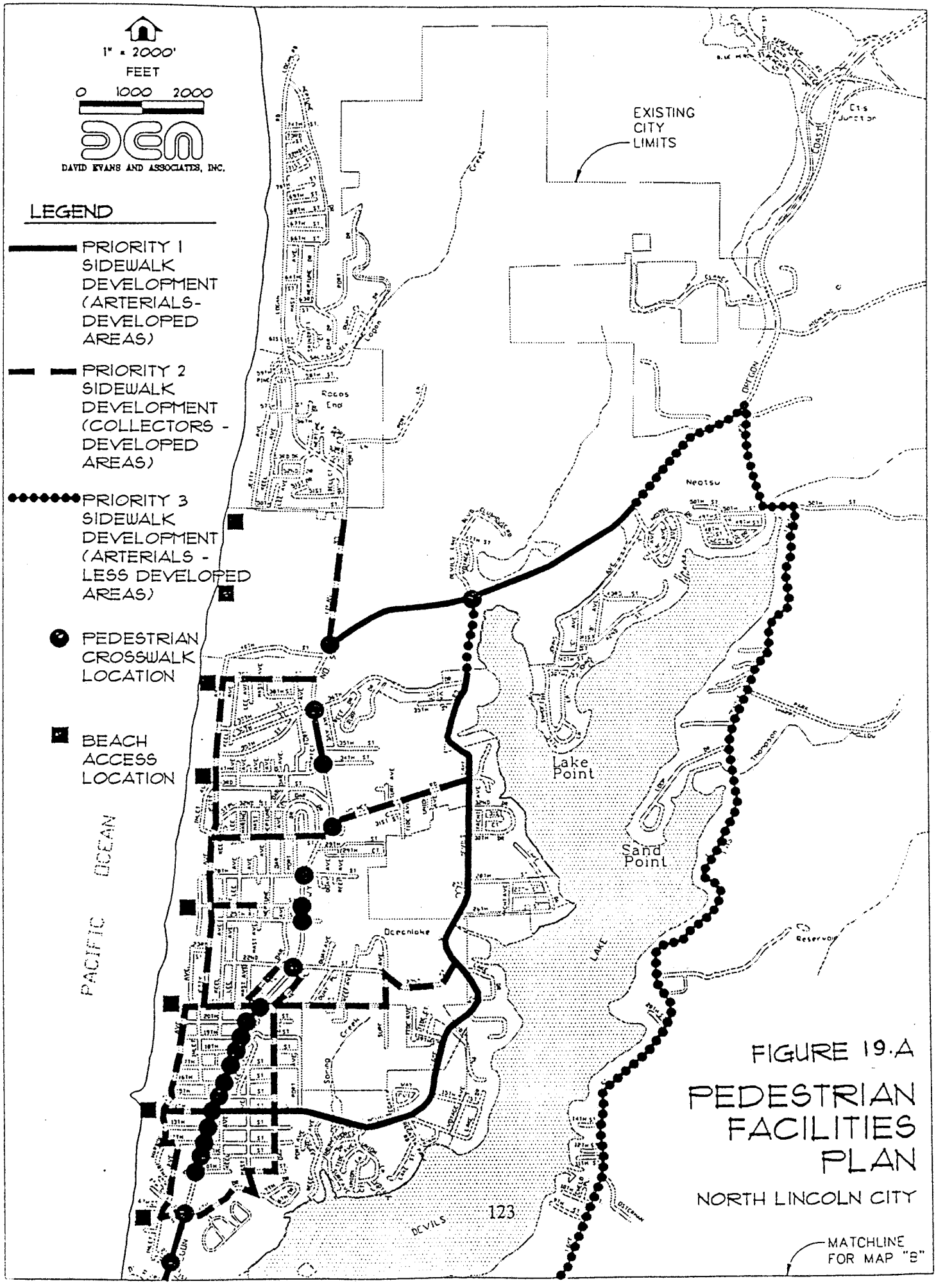


FIGURE 19.A

PEDESTRIAN FACILITIES PLAN

NORTH LINCOLN CITY

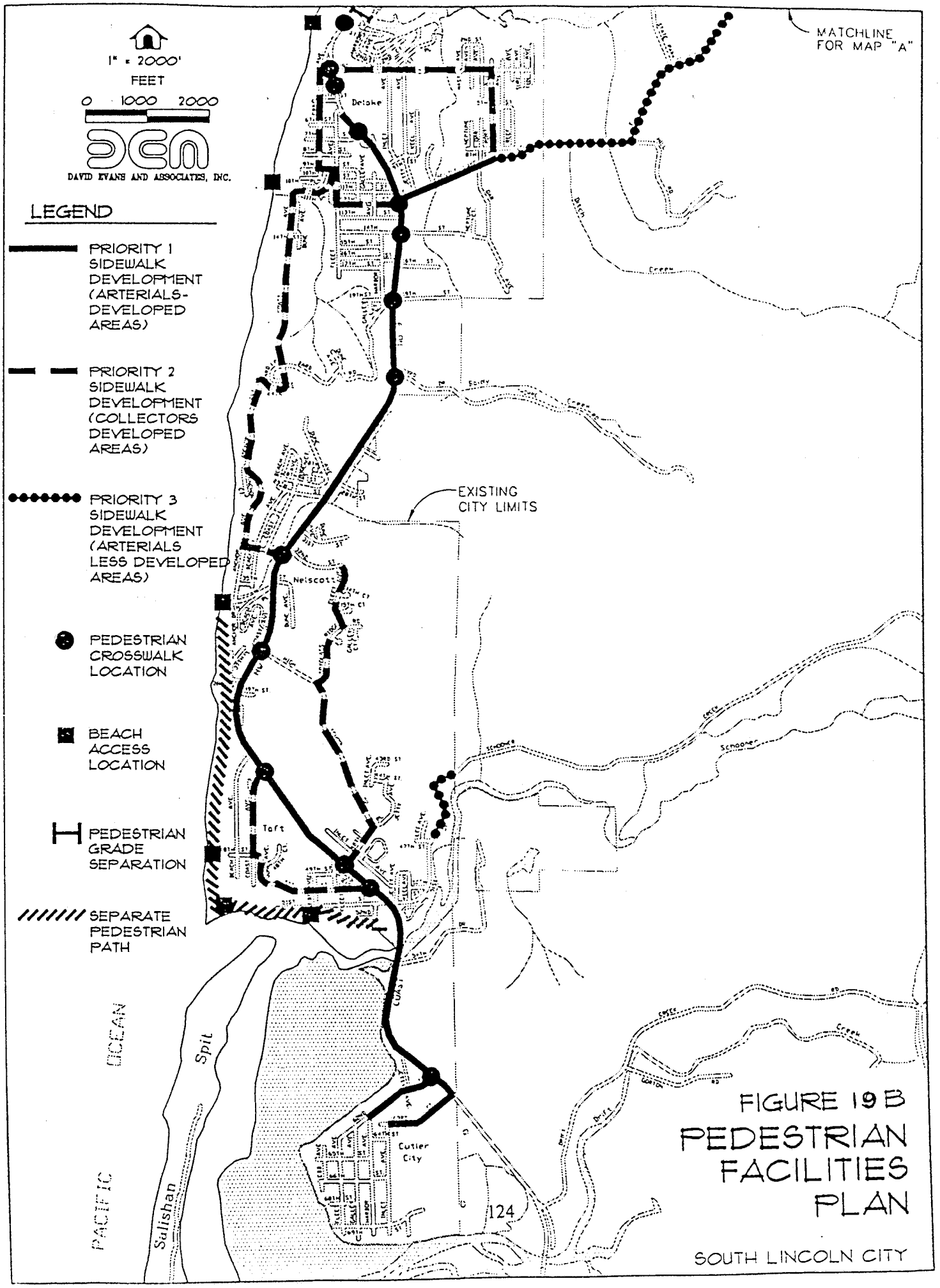


FIGURE 19B
PEDESTRIAN FACILITIES PLAN

SOUTH LINCOLN CITY

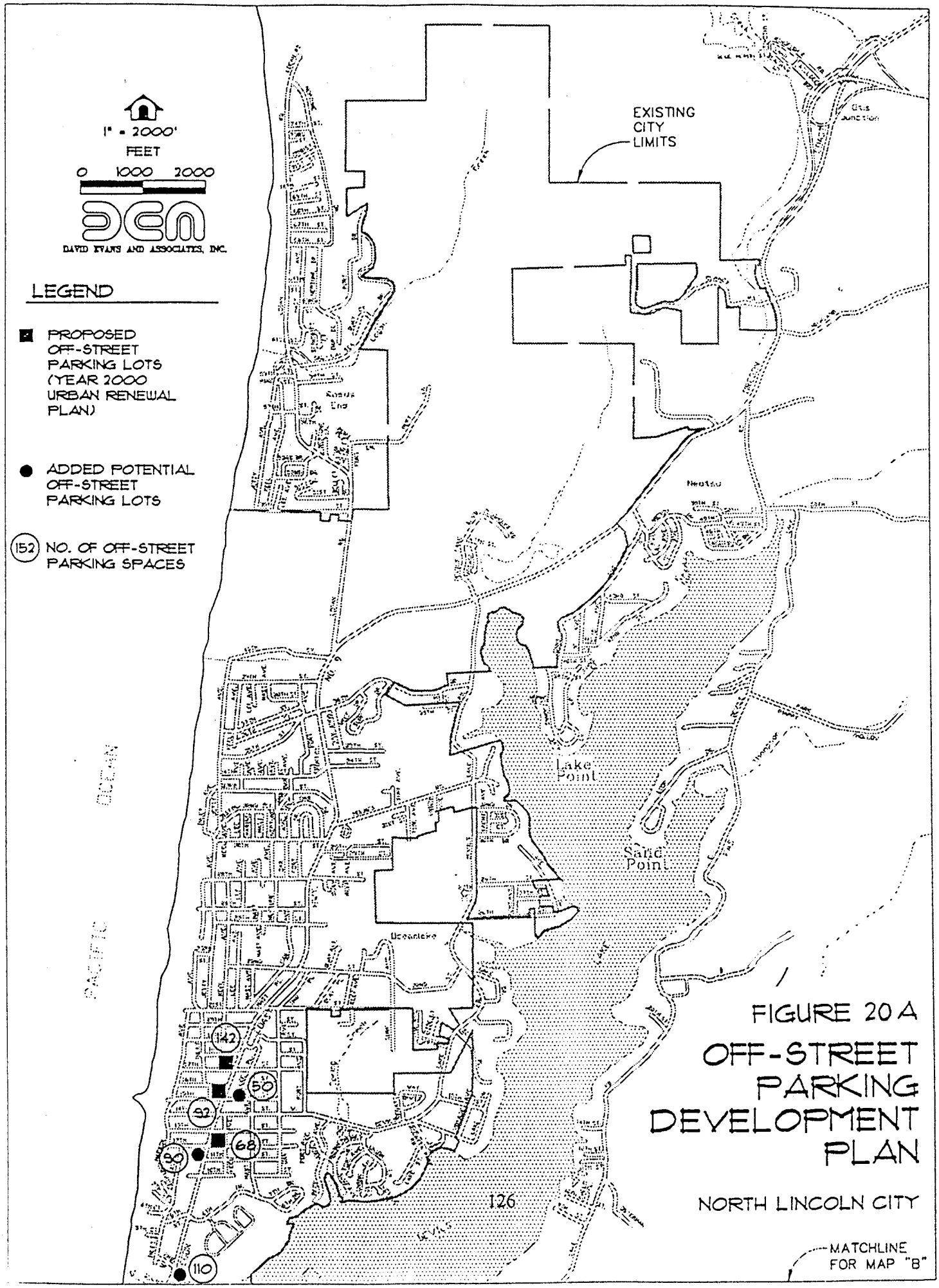


FIGURE 20A

OFF-STREET PARKING DEVELOPMENT PLAN

NORTH LINCOLN CITY

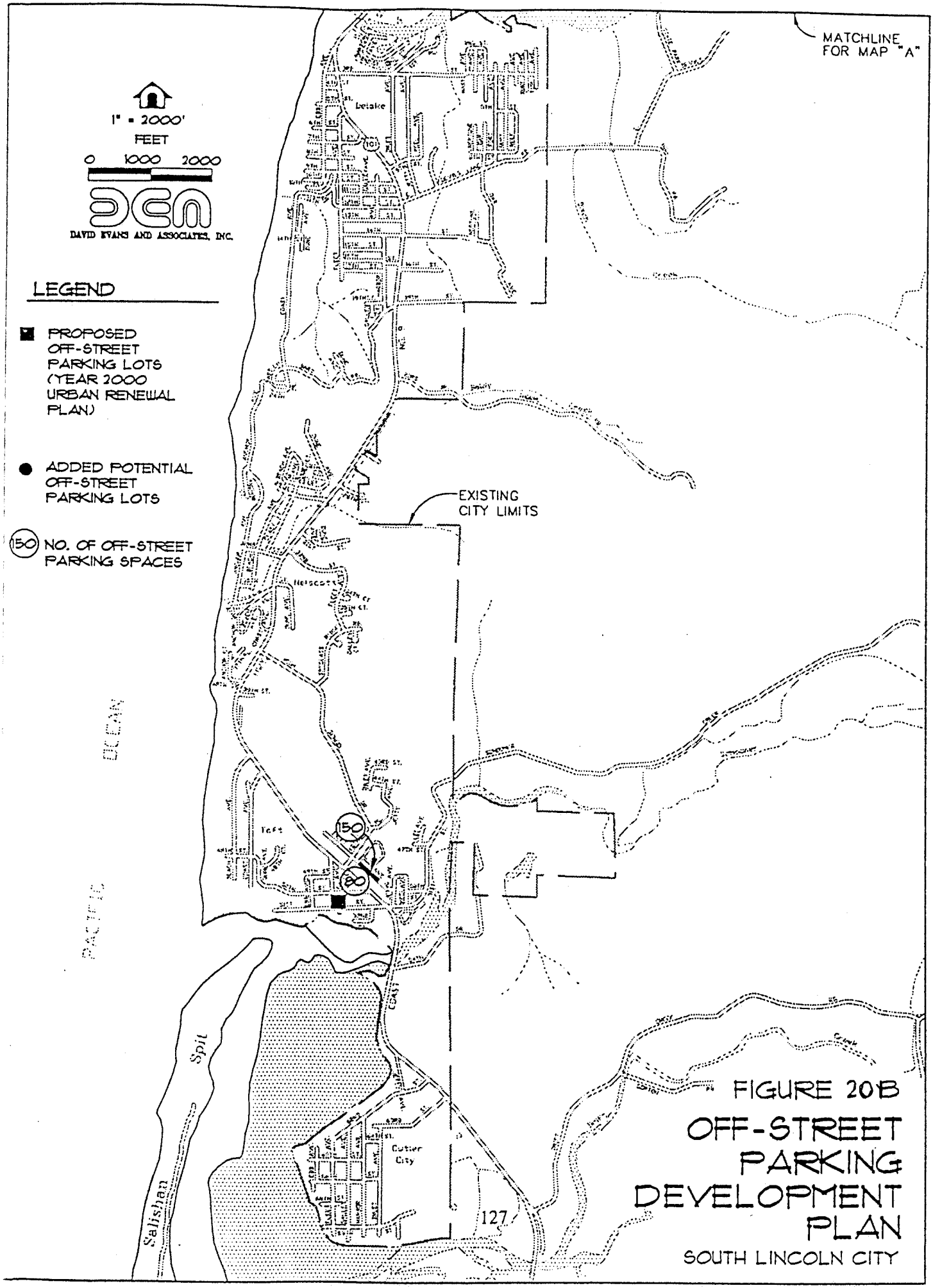


FIGURE 20B

OFF-STREET PARKING DEVELOPMENT PLAN

SOUTH LINCOLN CITY

<<<<<<<<<<<<<<<<<<<<<< C H A P T E R 1 0 >>>>>>>>>>>>>>>>>>>>

IMPLEMENTATION PROGRAM

The implementation program for transportation improvements is provided with the following priorities:

- Immediate - within one to two years;
- Phase 1 - prior to 1998 (corresponding to the time frame for the city's five-year capital improvement program);
- Phase 2 - 1998 to 2008;
- Phase 3 - 2008 to 2015; and/or
- With adjacent development/when warranted.

These priorities are based on current (ordinary) anticipated needs and the relationship between transportation system needs and community requirements. As stated earlier, the impacts associated with the (extra-ordinary) Casino/Convention Center project have not been addressed in this plan.

Some projects may not be needed until adjacent land develops, or when traffic signal warrants, for example, are warranted. The following schedule indicates priorities and must be modified in the future to reflect the availability of finances or the *actual* growth in population and employment. The schedule does not include lighting or any other *maintenance* activities.

The prioritization indicates the period during which, under *ordinary* circumstances, the improvement will need to be implemented. The casino project will doubtless impact these priorities. Sufficient lead time should be provided to allow for engineering design, permitting, land acquisition, and construction as needed to complete the improvement within the indicated time period.

IMMEDIATE PRIORITY (Within 1 to 2 years)

Regional Task Force

- Form a regional task force, with representatives from the Lincoln City area, Lincoln County, ODOT and others, to identify problem areas, to evaluate mutually acceptable solutions, and to coordinate efforts to achieve them.

On-Street Parking Removal

- Remove on-street parking on Hwy 101 all the way through town, as off-street parking becomes available, with the exception of the west side of the street between N.W. 21st and N.W. 22nd streets.

Signal Modifications

- Hwy 101/N. 21st Street - remove signal
- Hwy 101/N.W. 17th Street - install new signal

Pedestrian Crossing Improvements

Add pedestrian crossing signing on Hwy 101 at N. 28th, N. 25th, N. 22nd and N. 21st Streets.

Add vehicle stop bars on the N.W. Holmes Rd, S.E. 9th St., S.E. 19th St., S.W. Bard Rd. and S.W. 29th St. approaches to Hwy. 101; also the S.W. 11th Dr. approach to S.W. Fleet Ave, the N.E. Mast Pl. approach to N.E. 21st St., and the N.E. Mast Pl. approach to N.E. 22nd St.

Travel Lane Pavement Marking Modifications

Modify incorrect markings on S.W. 51st St., S.W. 12th St. (S.W. Fleet Ave. to Hwy 101), S.W. Beach Ave. (S.W. 48th St. to Hwy 101), and S.E. Jetty Ave. (north of N.E. 9th St.).

As Hwy 101 curbside parking is removed to other locations, restripe to define five lanes: four travel lanes with a center left-turn lane where appropriate.

Road Widening/New Construction

Widen S.E. *East Devils Lake Road from Hwy 101 east to S.E. Port Ave.*

Signing Modifications

Standardize placement of advance pedestrian crossing signing at school crossings.
Add "Do Not Enter" signs on north park driveway off Regatta Park ingress road.
Add directional signs at south Hwy 101/W. Devils Lake Rd. intersection.
Add curve warning signs on N.E. 22nd St. (east of N.E. Surf Ave.), on N.E. 36th St (west of W. Devils Lake Rd), and on W. Devils Lake Rd (north of N.E. 26th St.).
Add intersection warning signs on W. Devils Lake Road at N.E. 22nd St.
Add stop signs on S.W. 11th Dr. approach to S.W. Fleet Ave, S.E. Anchor Ct. approach to S.W. Anchor Ave., S.W. 32nd Ave. approach to S.W. Anchor Ave., S.E. 48th St. approaches to S.E. Coast Ave., and at the S.E. Beach Ave./S.E. 48th St. intersection.
Remove stop signs on S.E. Coast Ave. approaches to S.E. 48th Ave., and on the S.W. Jetty Ave. approach to Hwy 101.

Off-Street Parking Development

N.E. 15th St and N.E. Lee Ave. - N.W. corner, City Shop site.
N.W. Jetty Ave. between N.W. 15th and N.W. 16th Streets.

PHASE 1 - Prior to 1998

Roadway Widening/New Construction

- # New minor collector street between Devils Lake Blvd and Logan Rd. north of Hwy 101.
- # Improve N.W. Jetty Ave. between N.W. 21st and N.W. 25th Streets.

Intersection Channelization

- # Hwy 101/S.E. East Devils Lake Rd. - add NB right turn lane.
- # Realign S.E./S.W. 32nd St./Hwy 101 intersection.
- # Extend Hwy 101 west-side frontage road between S.W. 32nd and S.W. 35th St (convert S.W. 35th St. approach to Hwy 101 to right-in/right-out only).
- # Channelize driveway access at Siletz Bay Park.
- # Consolidate driveway access on west side of Hwy 101, south of N.W. 11th St.
- # Consolidate access by installing curbing on west side of Hwy 101, between S.W. Fleet and S.W. Galley Ave.

Signal Modifications

- # Hwy. 101/N. 22nd St. - install new signal heads, loop detection.
- # Hwy. 101/N. 14th St. - reconstruct signal, add loop detection.
- # Hwy. 101/N. 6th Dr. - reconstruct signal, add loop detection.
- # Hwy. 101/S. 51st. St. - reconstruct signal, add loop detection.
- # N.E. 14th St./N.E. Oar Ave. - install flashing all-red beacon.

Pedestrian Crossing Improvements

- # Add pedestrian crosswalks with signing on Hwy 101 at N.E. 22nd St., on N.E. Surf Ave., and on S.E. High School Drive at Taft High School (school crosswalks).

Travel Lane Pavement Marking Modifications

- # Add fog lines on West Devils Lake Rd. (from Hwy 101 south to N.E. Holmes Rd.) and on N.E. 14th St. (from S.E. Oar Ave. west to Hwy 101.)

Signing Modifications

- # Install beach guide signing off Hwy 101 at S. 51st St.

Off-Street Parking Development

- # S.E. Inlet Ave. (between S.E. Jetty Ave. and S.E. 48th Pl.) - 150-space surface lot.
- # N.E. 12th/13th Streets (east of Hwy 101) - 68 space surface lot.
- # N.W. 15th/16th Streets (west of Hwy 101) - 92 space surface lot.

PHASE 2 - 1998-2008

Road Widening/New Construction

- # Widen Hwy 101 between *N.W. Logan Rd. and N.W. 26th St.*
- # Widen Hwy 101 between *S. 14th St. and S.W. Coast Ave.*
- # Realign N.E. Holmes Rd to intersect N.W. 30th St. at Hwy 101.
- # Realign S.E. 48th Pl. to intersect S.W. Galley Ave. at Hwy 101.

Intersection Channelization

- # Realign N.W. 15th St/N.W. Harbor Ave. intersection.

Sidewalk Development

- # West Devils Lake Rd., from N.E. 36th St. south to Hwy 101.
- # N.W. 39th St.
- # N.W. Jetty Ave., from N.W. 21st St. to N.W. 39th.
- # N.W. 30th St./N.E. Holmes Rd.
- # N.W. 26th St., from N.W. Mast Ave. to N.W. Jetty Ave.
- # N.W. Mast Pl.
- # N.E. 22nd St., from N.E. Surf to West Devils Lake Rd.
- # N.E. 14th St.
- # N.E. Oar Pl.
- # N.E. Oar Ave., from N.E. 21st St. to N.E. 11th St.
- # N.E. 11th St., from N.E. Mast Ave. to N.E. Oar Ave.
- # N.E. Mast Ave, from N.E. 11th St. to N.E. 6th Dr.
- # N.E. 6th Dr., from N.E. Mast Ave. to Hwy 101.
- # S.E. 3rd St., from Hwy 101 to S.E. Port Ave.
- # S.E. Port Ave., from S.E. 3rd St. to East Devils Lake Rd.
- # S.W. Ebb Ave., from S.W. 9th St. to Hwy 101.
- # S.W. 12th St.
- # S.W. Coast Ave. Ave., from S.W. 11th Dr. to S.W. 24th St.
- # S.W. Anchor Ave., from S.W. 24th St. to S.W. 32nd St.
- # S.E. Fleet Ave., from S.E. 32nd St. to S.E. Spyglass Ridge Rd.
- # S.E. Spyglass Ridge Rd., from S.E. High School Dr. to S.E. Galley Ct.
- # S.E. High School Dr., from S.E. Spyglass Ridge Rd. to S.E. 48th Ct.
- # S.E. 48th Ct., from S.E. Inlet Ave. to S.E. High School Dr.
- # S.W. Coast Ave., from S.W. 48th St. to Hwy 101.
- # S.W. 50th St., from S.W. Dune Ave. to Hwy 101.
- # S.W. 62nd St., from S.W. Harbor Ave. to Hwy 101.
- # S.W. 63rd St., from S.W. Inlet Ave. to Hwy 101.

Off-Street Parking Development

- # East Side of Hwy 101 north of N.E. 1st St. - 110 space surface lot.

PHASE 3 - 2008-2015

Roadway Widening/New Construction

- # Widen Hwy 101 between Hwy 18 and N.W. Logan Rd. (Some of this is outside the city limits; ODOT's timetable probably puts this project before the year 2000.)
- # Widen Hwy 101 between S.W. 52nd Ct. and the City limits, including the Schooner Creek bridge.
- # Extend S.E. 48th Pl. northeast to connect to Schooner Creek Rd.

Sidewalk Development

- # East Devils Lake Rd. (south end), from Hwy 101 to S.E. Port Ave.
- # Schooner Creek Rd., from S.E. 47th St. north to City limits.

Pedestrian Path Development

- # Develop ocean front pedestrian path from Siletz Bay Park to S.W. 32nd St.

With Adjacent Development/When Warranted

Roadway Widening/New Construction

- # Timbershore local street construction
- # Develop S.W. Coast Ave. connection between S.W. 24th St. and S.W. 32nd St.

New Signals

- # Add signal on Hwy 101 at N.E. Holmes Rd/N.W. 30th St. alignment.
- # Add signal on Hwy 101 at S.E./S.W. 32nd St. realignment.
- # Add flashing beacon at Hwy 101/S.W. 62nd St.

CONSTRUCTION COST ESTIMATES

The estimated cost of each project listed in Table 12 was prepared on the basis of 1993 dollars. These are order-of-magnitude costs for design, construction, right-of-way acquisition, and contingencies. The cost estimates for roadway segments are very preliminary and do not include storm drains, water or sewer facilities, or more detailed intersection design. Except where noted, cost estimates were generated by David Evans & Associates consultants.

It is estimated that this program would cost approximately $39 million in 1993 dollars to implement. Cost estimates and potential funding participants are summarized in Table 12.

TABLE 12
CONSTRUCTION COST ESTIMATES

PROJECT	ESTIMATED COST (1993 DOLLARS)	POTENTIAL FUNDING PARTICIPANTS
Immediate Priority (Within 1-2 Years)		
<u>On-Street Parking Removal</u>		
■ Remove on-street parking on Highway 101	$4,000	ODOT
<u>Signal Modifications</u>		
■ Highway 101/N. 21st Street - remove signal	$15,000	ODOT
■ Add new signal at N.W. 17th	$100,000	ODOT
<u>Pedestrian Crossing Improvements</u>		
■ Add pedestrian crossing signing on Highway 101	$15,000	ODOT
■ Add vehicle stop bars at intersections	$3,000	
<u>Road Travel Lane Pavement Modifications</u>		
■ Modify incorrect markings on streets	$10,000	
<u>Roadway Widening/New Construction</u>		
■ Widen S.E. East Devils Lake Road between Highway 101 and S.E Port Avenue	$850,000	L.I.D.
<u>Signing Modifications</u>		
■ Relocate/add traffic control signing on streets	$8,000	
<u>Off-Street Parking Development</u>		
■ N.E. 15th Street and N.E. Lee Avenue (northwest corner)	$150,000	
■ N.W. Jetty Avenue between N.W. 15th Street and N.W. 16th Street	$150,000	
TOTAL	**$1,305,000**	
Phase 1 - Prior to 1998		
<u>Roadway Widening/New Construction</u>		
■ *Improve N.W. Jetty Avenue from N.W. 21st Street and N.W. 25th Street*	*$500,000*	
<u>Intersection Channelization</u>		
■ Highway 101/S.E. East Devils Lake Road - add NB right turn lane	$50,000	ODOT

TABLE 12 (Cont.)
CONSTRUCTION COST ESTIMATES

PROJECT	ESTIMATED COST (1993 DOLLARS)	POTENTIAL FUNDING PARTICIPANTS
■ Extend Highway 101 frontage road between S.W. 32nd Street and S.W. 35th Street	$100,000	ODOT
■ Realign S.E./S.W. 32nd Street at Highway 101	$250,000	
■ Local driveway consolidation along Highway 101	$30,000	ODOT
Signal Modifications		
■ Highway 101/N. 22nd Street - install new signal heads, loop detection	$20,000	ODOT
■ Highway 101/N. 14th Street - reconstruct signal, add loop detection	$120,000	ODOT
■ Highway 101/N. 6th Drive - reconstruct signal, add loop detection	$120,000	ODOT
■ Highway 101/S. 51st Street - reconstruct signal, add loop detection	$120,000	ODOT
■ N.E. 14th Street/N.E. Oar Avenue - install flashing all-red beacon	$5,000	
Pedestrian Crossing Improvements		
■ Add pedestrian crosswalks with signing on Hwy. 101	$5,000	ODOT
Road Travel Lane Pavement Marking Modifications		
■ Add fog lines on streets	$3,000	
Signing Modifications		
■ Install beach guide signing off Highway 101	$1,000	ODOT
Off-Street Parking Development		
■ S.E. Inlet Avenue (between S.E. Jetty Avenue and S.E. 49th Street) - 150-space surface lot	$450,000	Urban renewal
■ N. 12th/13th Streets east of Highway 101 - 68-space surface lot	$204,000	Urban renewal
■ N. 15th/16th Streets west of Highway 101 - 92-space surface lot	$276,000	Urban renewal
TOTAL	$2,254,000	
Phase 2 - 1998-2008		
Roadway Widening/New Construction		
■ Widen Highway 101 between N.W. Logan Road and N.W. 26th Street	$3,800,000	ODOT
■ Widen Highway 101 between S.E. 14th Street and S.W. ~~Beach~~ Coast Avenue	$6,200,000	ODOT

TABLE 12 (Cont.)
CONSTRUCTION COST ESTIMATES

PROJECT	ESTIMATED COST (1993 DOLLARS)	POTENTIAL FUNDING PARTICIPANTS
■ Realign N.E. Holmes Road to intersect N.W. 30th Street at Highway 101	$250,000	ODOT
■ Realign S.E. 48th Place to intersect S.W. Galley Avenue at Highway 101	$500,000	ODOT
Intersection Channelization		
■ Realign N.W. 15th Street/N.W. Harbor Avenue intersection	$100,000	
Sidewalk Development		
■ West Devils Lake Road	$140,000	Lincoln Co.
■ N.W. 39th Street	$16,000	L.I.D.
■ N.W. Jetty Avenue	$46,000	L.I.D.
■ N.W. 30th Street/N.E. Holmes Road	$36,000	L.I.D.
■ N.W. 26th Street	$5,000	L.I.D.
■ N.W. Mast Place	$6,000	L.I.D.
■ N.E. 22nd Street	$9,000	L.I.D
■ N.E. 14th Street	$7,000	L.I.D.
■ N.E. Oar Place	$6,000	L.I.D.
■ N.E. Oar Avenue	$14,000	L.I.D.
■ N.E. 11th Street	$4,000	L.I.D.
■ N.E. Mast Avenue	$11,000	L.I.D.
■ N.E. 6th Drive	$5,000	L.I.D.
■ S.E. 3rd Street	$23,000	L.I.D.
■ S.E. Port Avenue	$11,000	L.I.D.
■ S.W. Ebb Avenue	$14,000	L.I.D.
■ S.W. 12th Street	$11,000	L.I.D.
■ S.W. Coast Avenue	$36,000	L.I.D.
■ S.W. Anchor Avenue	$27,000	L.I.D.
■ S.E. Fleet Avenue	$8,000	L.I.D.
■ S.E. Spyglass Ridge Road	$7,000	L.I.D.
■ S.E. High School Drive	$22,000	L.I.D.
■ S.E. 48th Court	$5,000	L.I.D.
■ S.W. 50th Street	$13,000	L.I.D.
■ S.W. 62nd Street	$11,000	L.I.D.
■ S.W. 63rd Street	$9,000	L.I.D.
Off-Street Parking Development		
■ East side of Highway 101 north of N.E. 1st Street - 100-space surface lot	$300,000	
TOTAL	$11,652,000	

TABLE 12 (Cont.)
CONSTRUCTION COST ESTIMATES

PROJECT	ESTIMATED COST (1993 DOLLARS)	POTENTIAL FUNDING PARTICIPANTS
Phase 3 - 2008-2018		
Roadway Widening/New Construction		
■ Widen Highway 101 between Highway 18 and N.W. Logan Road	$10,000,000	ODOT
■ Widen Highway 101 between S.W. 52nd Court and the south city limits	$4,300,000	ODOT
■ Extend S.E. 48th Place to northeast to connect to Schooner Creek Road	$1,000,000	L.I.D.
Sidewalk Development		
■ East Devils Lake Road	$284,000	Lincoln Co.
■ Schooner Creek Road	$14,000	L.I.D.
Pedestrian Path Development		
■ Develop ocean front pedestrian path from Siletz Bay Park to S.W. 33rd Street	$100,000	
TOTAL	$15,198,000	
With Adjacent Development/When Warranted		
Roadway Widening/New Construction		
■ Timbershore local street improvements	$5,000,000	Developer
■ Develop S.W. Coast Avenue connection between S.W. 24th Street and S. 32nd Street	$1,000,000	Developer
New Signals		
■ Add signals on Highway 101 at N.E. Holmes Road/N.W. 30th Street and S. 32nd Street	$200,000	ODOT
■ Add flashing beacon at Highway 101/S.W. 62nd Street	$20,000	ODOT
TOTAL	**$6,220,000**	
GRAND TOTAL	$37,129,000	

MONITORING PROGRAM

In order to monitor the impacts that the implementation of the transportation plan will have on reducing traffic congestion, improving accessibility, and improving traffic safety in Lincoln city, a monitoring program would be required. This program should include the following components:

1. Traffic data collection;
2. Updated street facility inventory;
3. Traffic modeling of new developments;
4. Phase-in responsibilities of "Main Street" concept.

Components of this program are discussed below, as well as a system for identifying and evaluating traffic management improvements in local neighborhoods.

TRAFFIC DATA COLLECTION

In developing the traffic data base for the transportation plan, the city and the consultant obtained several 24-hour machine traffic counts on selected street segments and peak hour turning movement counts at certain intersections. This traffic count program should continue, focusing on the measurement of overall traffic increases and changes in traffic volumes associated with new street projects or new development, as well as identifying traffic volumes on local streets.

Traffic counts should be obtained during the summer months, when traffic volumes are highest due to the tourist influx along with the seasonal occupancy of vacation homes. ODOT should be increasing its traffic data collection efforts along Hwy 101 to include more traffic counts during the summer months. Lincoln County should obtain regular traffic counts on both East and West Devils Lake Roads. As recommended earlier, comprehensive traffic counts should be updated biennially.

The vehicle accident reporting system in place at the Lincoln City Police Department, culminating in the preparation of a summary report every year, was very useful in identifying existing traffic safety problems in the city, and should be continued.

The city should develop the capability of measuring vehicle spot speeds on the street system. This would aid in assessing speed limit viability as well as identifying the impact of through-traffic on the neighborhoods street system.

STREET CONDITION

The city's street inventory files should be reorganized to consolidate information on street characteristics and condition into one or two spreadsheets. Information should be categorized by block for each segment. The data base could be combined with a Pavement Management Information System (PMIS) to assess pavement deficiency and to identify improvement needs. Before a PMIS can be developed, a refined set of criteria should be created which would allow the identification

of pavement conditions and deficiencies by rating.

Consideration should be given to organizing a traffic control devices inventory which would indentify the location, type, and condition of all traffic signs and roadway striping, along with a maintenance record of all traffic control devices. There are several database software packages currently available for such inventory preparation.

MODELING THE TRAFFIC IMPACT OF NEW DEVELOPMENTS

As part of the Transportation Plan, a traffic forecasting model was developed which can be applied in the future to assess the "system-level" traffic impacts of major development proposals. Some level of training of city staff would be required to learn how to operate the model, or the services of an outside consultant could be utilized.

NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM PROCESS

In the Transportation Plan (Chapter 9), implementation of a Neighborhood Traffic Management program similar to that of the city of Portland is discussed. The process includes preliminary identification of a problem, a neighborhood petition process to secure an initial directive for further study, a final needs determination and recommendation. This would be followed by a test installation/evaluation and final neighborhood/council approval. Lincoln City's Traffic Safety Committee might coordinate this program. Portalnd's process has a criteria and point system which establishes a numerical score for each project. The criteria include: traffic volumes, speed, accidents, proximity of schools and local pedestrian traffic generators.

PHASE-IN OF THE "MAIN STREET" CONCEPT

The prime function of a community is to provide a safe and pleasant living and working environment. Lincoln City has reached a fork in the road: the state needs to utilize Hwy 101 as a "Scenic Byway" corridor--a tourist attraction that will attract millions of vehicles and generate millions of dollars for the state's economy; the community needs Hwy 101 to function more as its "Main Street" and less as a "through street". During a long and intense study period, the advisory committee has, with the support of the community, written a Plan that aims toward the Main Street concept.

Analysis of the state's Scenic Byway components tells us that the project would harm the community--not just during construction, but into the future. Hwy 101 is Lincoln City's only thoroughhfare; **there are no significant alternate north-south through roadways available.** That fact must be a major consideration in any transportation plan for the community.

Planning for *typical* growth in Lincoln City (which is predicted to be considerably above normal) would only be "challenging". The casino project will bring extra-ordinary growth and significant added transportation-associated problems. Include the traffic generated by an internationally-promoted scenic attraction--the state's Scenic

Byway--and major sacrifices would be required in all components of the community. Those sacrifices (social, commercial and environmental) would unquestionably lead to a degradation in the quality of life for all.

The common-sense "Main Street" concept has gained wide-spread acceptance in the community. It is anticipated that logical and temperate steps toward that goal will be taken to reach mutually beneficial agreements with the state. The Cannon Beach precedent is a standard to which Lincoln City can aspire. It is acknowledged that the decommissioning of Hwy 101--from a highway of state-wide significance to Lincoln City's Main Street--will call for financial participation by the community, and cooperation, flexibility, and dedication on the part of all participants.

M.L.K.

APPENDIX A

REVIEW OF PAST PLANS AND STUDIES

LINCOLN CITY TRANSPORTATION MASTER PLAN STUDY

TECHNICAL MEMORANDUM #1

REVIEW OF PAST PLANS AND STUDIES

This memorandum summarizes the review of past plans and studies related to transportation system development in the City of Lincoln City. The intent of the review was to acquaint the study consultant, David Evans and Associates, Inc. (DEA) with transportation issues, goals and objectives, and potential improvements which were needed to be address in the development of the transportation master plan.

The following reports were reviewed under this task:

1. *Lincoln City Comprehensive Plan*, City of Lincoln City, January 23, 1984.

2. *Lincoln City Transportation Safety Study - Final Report*, Lincoln City, Oregon, Straam Engineers, December 1981.

3. *Year 2000 Development Plan - An Urban Renewal Plan and Program for the City of Lincoln City, Oregon*, Lincoln City Urban Renewal Authority, October 27, 1988.

4. *Lincoln City Origin and Destination Study*, ODOT System Studies Unit, November 30, 1990.

5. *Lincoln City Bicycle Master Plan*, JRH Transportation Engineering, February 1987.

6. *City Street Lighting in Oregon*, University of Oregon Bureau of Governmental Research and Service, January 1987.

7. *Resolution Regarding the Policy of the City of Lincoln City Relating to Financial Participation by the City in Improving Streets within the City*, January 1991.

There is no current comprehensive, multimodal transportation plan document prepared for the City of Lincoln City.

The following summarizes the basic content of each of these reports as it relates to Lincoln City's transportation system, and the interrelationship of these documents.

LINCOLN CITY COMPREHENSIVE PLAN

The Lincoln City Comprehensive Plan recognizes the need for improvements to Highway 101 in the future and a possible long-range plan for a bypass, as well as promoting the development of a multimodal transportation plan. However, the document does not address specific transportation facility plans and programs.

The discussion on transportation system development in the current 1984 Lincoln City Comprehensive Plan is limited to the presentation of a single transportation goal and nine associated policies:

Transportation Goal

To provide a safe, convenient and rapid transportation network to facilitate the movement of goods and people

Transportation Policies

1. *The City shall consider the impact of proposed development on the proposed routes outlined in the City Street Inventory where development is proposed.*

2. *The City shall require that Highway 101 related alternatives shown in the Traffic Safety Program be evaluated by the Oregon Department of Transportation in their design review for Highway 101 improvement projects within Lincoln City.*

3. *The City's number one priority shall be to acquire professional design and engineering assistance to evaluate inventory and other alternatives for improving citywide transportation.*

4. *The City shall consider utilization of a mass transit system and shall explore various forms of funding.*

5. *The City shall continue efforts to support and establish a route for through traffic other than Highway 101, such as a Lincoln City Bypass.*

6. *The City shall develop a system of frontage roads and parking lots accessible to Highway 101 linked to a pedestrian system for commercial and service access and limited vehicular traffic.*

7. *The City shall work with residents to form local improvement districts to improve roads within the City.*

8. *The City shall work with a committee of citizens to formulate parking improvement plans for congested areas.*

9. *The City shall continue to acquire state and federal funds for transportation improvements.*

LINCOLN CITY TRANSPORTATION SAFETY STUDY

The last comprehensive assessment of transportation problems in Lincoln City was in 1981, when a Transportation Safety Study was conducted. This study focused on a detailed analysis of roadway system deficiencies, identifying and evaluating roadway, pedestrian, and bicycle facility improvements and funding sources, and developing a final set of improvement recommendations. The study was funded by the Oregon Traffic Safety Commission.

Problem Analysis

Twelve major areas were addressed in the "problem analysis" component of the study:

1. Revision and adoption of a new set of design standards for City streets.

2. Identification and prioritization of high traffic accident locations.

3. Identification of priority police enforcement areas.

4. Identification of traffic signal problems and needs.

5. Identification of pedestrian problems.

6. Identification of highway capacity problems.

7. Identification of local traffic circulation problems.

8. Identification of parking problems.

9. Problems created by major committed developments.

10. Street system deficiencies.

11. Pavement marking deficiencies.

12. Sign deficiencies.

The problem analysis identified numerous transportation problems, along with remedial actions. The improvement recommendations identified from the study were as follows:

New Standards for City Streets

A revised set of street width and laneage requirements were identified, for different functional classifications:

Functional Classification	Travel Lanes	R-O-W Width	Pavement Width
Residential	2	40-50 feet	28 feet
Minor Collector	2	40-60 feet	28-40 feet
Major Collector	2-4	60-80 feet	28-64 feet
Arterial	2-4	80-120 feet	40-96 feet

The standards also included recommended pedestrian treatments, parking prohibition near intersections, and other design criteria.

Identification and Prioritization of Traffic Accident Locations

Eighteen hazardous locations (all intersections on Highway 101) were identified in need of improvement.

Identification of Priority Police Enforcement Areas

Six areas were identified where there were serious traffic problems and where traffic enforcement would be beneficial:

Area #1: Highway 101 - N. 12th Street to N. 21st Street
Area #2: Highway 101 - S. 9th Street to N. 6th Street
Area #3: Highway 101 - S. 51st Street to S. 40th Street
Area #4: Highway 101 - N. 38th Street to Dunes Road, Logan Road to West Devils Lake Road
Area #5: High School Drive south to S.E. 48th Place east to Schooner Road
Area #6: Holmes Road east to West Devils Lake Road south to N.E. 22nd and N.E. 14th Streets

Identification of Traffic Signal Problems and Needs

The study identified the need for new signals and the upgrading of existing signals at various other locations. New signals were identified as being warranted at the Logan Road and East Devils Lake Road intersections on Highway 101.

Existing traffic signals requiring upgraded equipment that were identified included the S. 51st Street, S. 48th Place, S. 25th Street, N. 6th Street, N. 14th Street, and N. 21st Street intersections along Highway 101. Coordination and timing modifications were identified for the traffic signals on Highway 101 at N. 6th Street, N. 14th Street, N. 21st Street, N. 22nd Street, and N. 25th Street.

Identification of Pedestrian Problems

Several crosswalks on Highway 101 were recommended for improvement, due to the lack of visibility, the high number of crosswalks in certain locations, and the high traffic volumes and speeds on Highway 101.

Identification of Local Traffic Circulation Problems

Four recommendations to improve local traffic circulation in the west portion of Lincoln City were identified:

1. Designate beach access route.

2. Identify routes with appropriate signing.

3. Upgrade roads with pavement overlays, widening, and pavement markings.

4. Identify a series of north-south streets to provide an alternate route to Highway 101.

Identification of Parking Problems

Two major parking problems on Highway 101 were identified:

1. Vehicles park too close to intersections and crosswalks causing poor sight distance and creating hazardous conditions.

2. There is a high parking demand on Highway 101 between N. 11st Street and N. 25th Street, with a major parking problem at N. 17th Street intersection.

Problems Created by New Developments

Ten new developments were identified (seven in north Lincoln City, one in central Lincoln City, and two in south Lincoln City). The developments would impact traffic conditions on Highway 101, and require widening of certain east-west cross streets.

The specific developments evaluated included:

North Lincoln City

Wecona Winds
George marshall
Timbershore
Na-Ah-So
Sound Development
Howard Hills

Central Lincoln City

Indian Shores

South Lincoln City

Saltwood
Spyglass ridge
Cutler City

Street System Deficiencies

Five miles of the City street system were identified in immediate need of complete pavement reconstruction. An additional eight miles were in need of pavement overlay.

Pavement Marking Deficiencies

About 80% of the streets inventoried were needed pavement marking improvements.

Sign Deficiencies

Sixteen locations were identified where sign improvements were required for safety reasons. Other locations were identified where guide signs were required, particularly to direct traffic to beach access points.

Recommended Transportation Improvement Priorities

Through a number of public meetings and workshops, three top priorities for transportation improvements in the City were recognized:

1. Improve the City's 18 highest accident locations and improve pedestrian crosswalk locations.

2. Widen and improve Highway 101 and upgrade traffic signals in certain sections.

3. Remove on-street parking along certain sections of Highway 101 and replace with off-street parking lots.

Other improvement priorities were identified as follows:

- Improve signing and pavement markings on certain streets.

- Widen and improve City streets to accommodate future residential and commercial development.

- Develop a north-south system of collector streets for local traffic as an alternative to using Highway 101.

- Implement a pavement resurfacing program.

Financing

A strategy using federal, state and local funds was recommended for implementing the transportation improvements identified. Three local funding mechanisms were considered to have the most potential: system development charges, local improvement districts, and tax increment financing.

YEAR 2000 URBAN RENEWAL PLAN

The Lincoln City Urban Renewal Plan focuses on the Highway 101 corridor through the City. Several transportation improvements have been identified in the plan, including new and modified traffic signals, constructing curbs and sidewalks (including street furniture and landscaping improvements), constructing curb extensions and crosswalk pavers at intersections, construction of off-street trails, and developing off-street parking areas and beach access points.

New/Modify Existing Traffic Signals

Modification to all 12 existing traffic signals through the City was recommended. However, no specific improvements were identified. New traffic signals were recommended on Highway 101 at three intersections: N. Holmes Road, S. 32nd Street, and High School Drive.

Construction of Curbs, Sidewalks, and Pedestrian Amenities

Four sections along Highway 101 were identified for curb, sidewalk, street furniture, and/or landscaping improvements:

1. From N. 35th Street to 900 feet south.

2. From N. 28th Street south to S. Fleet Avenue.

3. From S. 32nd Street south to S. 37th Street.

4. From S. Fleet Avenue to Schooner Creek Bridge.

In addition, the section of S. 51st Street from Highway 101 to 1,800 feet to the west is identified for improvement.

Curb Extensions

Curb extensions at some unsignalized intersections were recommended to improve traffic flow and reduce pedestrian/vehicle conflicts. Specific locations were not specified pending the results of further planning and engineering studies.

Crosswalk Pavers

Concrete pavers at certain crosswalks across Highway 101 and other streets were recommended. Up to 22 intersections along Highway 101 and another 30 intersections off Highway 101 within the Urban Renewal Area were identified for this treatment.

Nature Trail Development

A nature trail along Highway 101 for about 1,200 feet south of S. 29th Street was proposed.

Off-Street Parking

The Urban Renewal Plan calls for the elimination of on-street parking through the urban renewal area and the development of a continuous landscaped median/center left turn lane treatment. With this improvement, on-street parking would need to be removed. An analysis revealed that to meet existing off-street parking deficiencies and to replace on-street parking, an added 2,800 off-street parking spaces would be required. Several locations for off-street parking development were identified, including S. 51st Street, N. 6th Drive, N. 12th/13th Streets, N. 15th/16th Streets, and N. 17th/18th Streets.

Parking at Beach Access Locations

Three locations were identified where improved parking and pedestrian access to beach areas was desirable:

1. At N. 21st Street;

2. At. S.W. 35th Street; and

3. At S. 33rd Street, between S.W. Anchor Avenue and the ocean.

In addition, several potential locations for beach access and parking development in the Cutler City area were identified.

LINCOLN CITY ORIGIN-DESTINATION STUDY

The Oregon State Highway Division vehicle origin-destination survey was conducted to identify the traffic diversion and impacts associated with a possible Highway 101 bypass of Lincoln City. The survey was conducted in September 1990. Some of the conclusions from the study were as follows:

1. Traffic volumes on Highway 101 during the average summer weekday are about 35% higher than the annual average daily traffic volume.

2. The average summer weekday condition reflects a design hour condition.

3. Traffic volumes diverted to a bypass will require a bypass with four lanes.

4. Traffic volumes on Highway 101 would reduce significantly at first with a bypass, but would increase to current levels or above by year 2015.

5. 42% of those people surveyed said they would use the bypass if available, while 47% would use an improved Highway 101.

LINCOLN CITY BICYCLE MASTER PLAN

A bicycle master plan for Lincoln City was prepared in 1987 through funding from the Oregon Traffic Safety Commission (OTSC), to guide the development of the City's bicycle system. This planning effort was a prelude to a request to OTSC to fund a program of engineering and education to identify bike route alternates to Highway 101, to develop a bike route signing system, and to develop a bicycle safety educational program.

Recommendations

General, bikeway-specific, and support recommendations were developed.

General Recommendations

1. A review of the bikeway master plan should occur every three years.

2. The City should actively promote bicycles as a means of transportation for City residents.

3. The City should publicize the bikeway system to increase tourism.

4. All new street construction, street repair, and subdivision design should consider bicycles in their design.

5. Bikeway system maps should be published for general distribution in the City, and should be placed on signs at suitable locations at both the north and south entrances to the City.

Bikeway Recommendations

1. Bikeways should be included in the design of all new collector and arterial streets if possible.

2. Bikeway facilities should be constructed in accordance with standards set forth in the American Association of State Highway and Transportation Officials in their 1981 *Guide for Development of New Bicycle Facilities.*

3. Maintenance of the bikeway system should have the same priority as the maintenance of other elements of the transportation system.

4. Implementation of the bikeway system should follow the priorities and schedule outlined in the master plan.

Support Recommendations

1. Bicycle parking and locking facilities should be provided at:

   - all school and civic buildings;
   - beach access locations;
   - new commercial, office, and industrial developments;
   - public parks and other recreational locations; and
   - newly developed multi-family residential units.

2. A continuous public awareness program of the rights and obligations of bicyclists should be developed.

3. A uniform system of enforcement of bicycle laws and motor vehicle regulations affecting bicycles should be developed, which would include special training for enforcement officers.

4. The City should work with local schools to develop an educational program to identify bicycle safety issues related to Lincoln City's bicycle program.

Bikeway Route Plan

A route plan was developed with input from a committee of bicycle enthusiasts in the City. Twelve specific routes were identified:

1. Coast Line Loop (N. 39th Street to N.1st Street)
2. Highway 101 (S.R. 18 interchange to south City limits)
3. Holmes Road Connector (Highway 101 to West Devils Lake Road)
4. West Devils Lake Loop
5. 21st-22nd Connector (Highway 101 to West Devils Lake Road)
6. East Devils Lake Road Loop
7. High School Drive Loop (S.E. 23rd Street and High School Drive)
8. High School Connector (High School Drive from Highway 101 to S.E. 23rd Street)
9. Taft Loop (using S.W. Anchor Ave., S.W. 48th Street, S.W. Dune Avenue, and S.W. 50th Avenue)

10. Cutler City Loop (using S.W. 62nd Street, S.W. Fleet Avenue, S.W. 69th Street, S.W. Inlet Avenue, and S.W. 63rd Street)

CITY STREET LIGHTING IN OREGON REPORT

A comprehensive study was conducted in 1985 to analyze the inventory and expenditures of city street lighting in Oregon, and to identify available options for cities to reduce street light expenditures. The study included an analysis of conditions in Lincoln City.

The following street lighting data was collected in Lincoln City:

1. 894 street lights in City, including 535 with mercury vapor fixtures and 359 with high pressure sodium fixtures.

2. All street lights are owned and maintained by a utility company (Pacific Power). On the average, only 48% of the street lights in cities in Oregon were owned and maintained by utility companies, while 36% were city owned and utility maintained, and 17% were city owned and maintained.

3. In 1985, there were 14.75 lights for every 100 people in the City, and 15.72 lights per road mile.

4. In 1985, the annual street light expenditure was $106,400. This translated into an average pole charge of $1,012, $17.56 per capita, and $18.71 per road mile. The charge per capita in Lincoln City was the eighth highest of all cities in Oregon.

5. In 1985, the street light expenditure in Lincoln City was made up of energy cost (52%), rental and maintenance (47%), and poles (1%). The rental and maintenance cost in Lincoln City is higher than the average of all cities in Oregon as all poles in the city were owned by Pacific Power.

In the report, options were identified to reduce energy-related city street light expenditures. These options included:

1. Delamping - temporary or permanent removal of selected street lights.

2. Conversion - replace existing lights with more energy-efficient lights (e.g. replace mercury vapor with high pressure sodium vapor lights).

3. System purchase - buy system from the utility company. City could maintain system or have the utility company continue maintenance.

4. Reduction in operating hours - decrease the hours of street light operation to a portion of the night instead of from dawn to dusk.

5. System redesign - possible reconfiguration of the system (i.e. reduce lumens for a given location, or replace several small lights with one large light).

The study applied the different options to all cities in Oregon, including Lincoln City. The analysis identified the following savings:

1. $21,000 annual savings with a 20% delamping, $10,000 savings with a 10% delamping.

2. $51,000 annual savings if City were to purchase and maintain system.

3. $71,000 annual savings if a combined option were chosen (City removes 20 percent of the lights, owns and maintains the system, and converts all lights to high pressure sodium vapor).

RESOLUTION ON CITY FINANCIAL PARTICIPATION ON STREET IMPROVEMENTS

In 1991, an updated resolution was passed by the Lincoln City City Council on financial participation in street improvements to the city street system. This participation relates to improving existing streets to full City design standards. The resolution presents definitions for arterial, collector and local street classifications, and identifies the following financial participation strategy for collector and local street improvements (improvements to the only designated arterial, Highway 101, are the responsibility of the Oregon State Highway Division):

1. Local streets - Up to 30% City participation (abutting property owners pay for remaining 70%).

2. Collector streets - Up to 60% City participation (abutting property owners pay for remaining 40%).

Street improvement projects may be initiated by either property owners or the city Council, and will be processed by the Local Improvement District procedure identified in the Lincoln

City Municipal Code. The City has the option of participating in street improvements not involving the formation of Local Improvement Districts.

ARD:kam

APPENDIX B

STREET INVENTORY

STREET INVENTORY TABLE

Street Segment	Classification	Juris-diction	ROW Width	Street Width	Num-ber of travel lanes	On-Street Parking	Sidewalk	Bike Lanes	Speed Limit	Pavement Condition	Pavement Markings
US 101											
Drift Creek Road to S. 64th Street	Arterial	State		38	2	Shoulder	No	Bike Route	55	V. Good	2YCL/R/FL
S. 64th Street to S. 54th Drive	Arterial	State		38	3	Shoulder	No	Bike Route	35	V. Good	2YCL/R/FL
S. 54th Drive to S. 52nd Court	Arterial	State		37	2	Shoulder	6'	Bike Route	30	V. Good	2YCL/R/FL
S. 52nd Court to S. 48th Street	Arterial	State		62	4	Both Sides	8'-10' Both Sides	Bike Route	30	V. Good	2YCL/R/FL
S. 48th Street to Beach Avenue	Arterial	State		67	4	Shoulder	No	Bike Route	30	V. Good	2YCL/R/FL
Beach Avenue to S. 32nd Street	Arterial	State		47	3	Shoulder	No	Bike Route	35	V. Good	2YCL/R/FL
S. 32nd Street to S. 19th Street	Arterial	State		39	2	Shoulder	No	Bike Route	35	V. Good	2YCL/R/FL
S. 19th Street to East Devils Lake Road	Arterial	State		82	4	Shoulder	No	Bike Route	35	V. Good	2YCL/FL
East Devils Lake Road to Galley	Arterial	State		71	5	Shoulder	No	Bike Route	35	V. Good	2YCL/R
Galley Street to Fleet Street	Arterial	State		63	4	Shoulder	No	Bike Route	35	V. Good	2YCL/R
Fleet Street to Ebb Street	Arterial	State		65	4	Both Sides	8' Both Sides	Bike Route	35	V. Good	2YCL/R
Ebb Street to S. 1st Street	Arterial	State		65	4	No	No	Bike Route	35	V. Good	2YCL/R
S. 1st Street to 'D' River Bridge	Arterial	State		65	4	No	6' Both Sides	Bike Route	35	V. Good	2YCL/R
'D' River Bridge to N. 1st Street	Arterial	State		60	4	No	No	Bike Route	30	V. Good	2YCL
N. 1st Street to N. 10th Street	Arterial	State		60	5	No	4'-9' Both Sides	Bike Route	30	V. Good	2YCL/R
N. 10th Street to N. 16th Street	Arterial	State		60	5	No	4'-9' Both Side	Bike Route	30	V. Good	2YCL/R
N. 16th Street to N. 17th Street	Arterial	State		60	5	Westbound	4'-9' Both Sides	Bike Route	30	V. Good	2YCL/R
N. 17th Street to N. 18th Street	Arterial	State		60	5	Eastbound	4'-9' Both Sides	Bike Route	30	V. Good	2YCL/R
N. 18th Street to N. 21st Street	Aertial	State		60	4	Both Sides	4'-9' Both Sides	Bike Route	30	V. Good	2YCL/R

Street Segment	Classification	Juris-diction	ROW Width	Street Width	Num-ber of travel lanes	On-Street Parking	Sidewalk	Bike Lanes	Speed Limit	Pave-ment Condi-tion	Pavement Markings
N. 21st Street to N. 22nd Street	Arterial	State		78	5	Westbound	4'-9' Both Sides	Bike Route	30	V. Good	2YCL/R
N. 22nd Street to N. 26th Street	Arterial	State		80	4	No	4'-9' Both Sides	Bike Route	30	V. Good	2YCL/R/FL
N. 26th Street to N. 34th Street	Arterial	State		60	3	No	4'-9' Both Sides	Bike Route	30	V. Good	2YCL/R/FL
N. 34th Street to N. 36th Street	Arterial	State		55	3	No	No	Bike Route	30	V. Good	2YCL/R
N. 36th Street to Logan Road	Arterial	State		77	3	No	4'-9' South-bound	Bike Route	30	V. Good	2YCL/R
Logan Road to East Devils Lake Rd.	Arterial	State		31	2	No	4'-9' South-bound	Bike Route	45	V. Good	2YCL/R/FL
<u>SW 69th Street</u>											
SW Fleet Avenue to SW Galley Avenue	Minor Collector	City	50	16	2	No	No	Bike Route	25	V. Good	No
SW Galley Avenue to SW Harbor Ave.	Minor Collector	City	50	16	2	No	No	Bike Route	25	V. Good	No
SW Harbor Avenue to SW Inlet Avenue	Minor Collector	City	30	20	2	No	No	Bike Route	25	V. Good	No
<u>SW Inlet Avenue</u>											
SW 63rd Street to SW 64th Street	Minor Collector	City		29	2	Both Sides	No	Bike Route	25	V. Bad	No
SW 64th Street to SW 65th Street	Minor Collector	City		29	2	Both Sides	No	Bike Route	25	Good	No
SW 65th Street to SW 66th Street	Minor Collector	City		29	2	Both Sides	No	Bike Route	25	Good	No
SW 66th Street to SW 67th Street	Minor Collector	City		28	2	Both Sides	No	Bike Route	25	V. Bad	No
<u>SW 63rd Street</u>											
SW Inlet Avenue to SW Keel Avenue	Minor Collector	City	50	30	2	Shoulder	No	Bike Route	25	V. Good	No
SW Inlet Avenue to West to Dead End	Minor Collector	City	40	24	2	Shoulder	No	Bike Route	25	V. Good	No
SW Keel Avenue to S. Hwy. 101	Minor Collector	City	40	29	2	Shoulder	No	Bike Route	25	V. Good	No

Street Segment	Classification	Juris-diction	ROW Width	Street Width	Num-ber of travel lanes	On-Street Parking	Sidewalk	Bike Lanes	Speed Limit	Pave-ment Condi-tion	Pavement Markings
SW 68th Street											
West End to SW Fleet Avenue	Minor Collector	City	50	17	2	No	No	No	25	V. Good	No
SW Fleet Avenue/62nd Street											
S. Hwy 101 to SW 50th Street	Minor Collector	City		24	2	Shoulder	No	Bike Route	25	V. Good	No
SW 62nd Street to SW 69th Street	Minor Collector	City		17	2	Shoulder	No	Bike Route	25	V. Good	No
SW Jetty Avenue											
U.S. 101 to SW 62nd	Minor Collector	City		13	1	Shoulder	No	Bike Route	25	V. Good	No
SE Schooner Creek Road											
US 101 to Keel Avenue	Minor Collector	City		31	2	Westbound	No	No	35	V. Good	2YCL/FL
Keel Avenue to City Limits	Major Collector	City	50	24	2	Shoulder	No	No	35	V. Good	2YCL/FL
SW 51st Street											
West End to US 101	Minor Collector	City	50	36	2	Both Sides	6' Both Sides	No	25	V. Good	SL/R
SW 50th Street/SW 48th Street											
US 101 to Galley Avenue	Minor Collector	City	50	40	2	Both Sides	6' West-bound	Bike Route	25	V. Good	SL
Galley Avenue to Ebb Avenue	Minor Collector	City	50	27	2	Shoulder	Shoulder	Bike Route	25	V. Good	SL
Ebb Avenue to Beach Avenue	Minor Collector	City	50	22	2	Shoulder	No	Bike Route	25	V. Good	2YCL
SW Beach Avenue											
SW 48th Street to S. Hwy. 101	Minor Collector	City	40	22	2	Shoulder	No	Bike Route	25	V. Good	SL
SW Coast Avenue											
SW 48th Street South to Dead End	Minor Collector	City	45	24	2	No	No	No	25	Fair	No

Street Segment	Classification	Juris-diction	ROW Width	Street Width	Num-ber of travel lanes	On-Street Parking	Sidewalk	Bike Lanes	Speed Limit	Pave-ment Condi-tion	Pavement Markings
SW 48th Street to Access	Minor Collector	City	45	22	2	Shoulder	No	No	25	V. Good	SL
Access to S. Hwy. 101	Minor Collector	City	45	18	2	Shoulder	No	No	25	V. Good	SL
SW 32nd Street to SW 29th Street	Minor Collector	City	40	22	2	Shoulder	No	No	25	V. Good	No
SW 29th Street to SW 28th Street	Minor Collector	City	40	17	2	No	No	No	25	V. Good	No
SW 28th Street to SW Beach Avenue	Minor Collector	City	40	19	2	No	No	No	25	V. Good	No
SW 24th Drive to SW Bard Loop	Major Collector	City	40	20	2	No	No	No	25	V. Good	No
SW Bard Loop to SW 14th Street	Major Collector	City	40	17	2	No	No	No	25	Bad	No
SW 14th Street to SW Terrace Drive	Major Collector	City	40	17	2	No	No	No	25	V. Good	No
SE High School Drive											
S. Hwy. 101 to SE Spyglass Ridge Dr.	Minor Collector	City	50	26	2	No	No	Bike Route	25	V. Good	SL/R
SE Spyglass Ridge Dr. to SE 48th Place	Minor Collector	City	50	26	2	No	No	Bike Route	25	V. Good	SL/R
SW 35th Street											
S. Hwy. 101 to Anchor Avenue	Major Collector	City	50	20	2	No	No	No	25	V. Good	No
SW Anchor Avenue											
SW 24th Street to SW Anchor Court	Major Collector	City	40	20	2	No	No	No	25	Good	2YCL
SW 30th Street to SW 32nd Street	Major Collector	City	35	20	2	No	No	No	25	Good	2YCL
SW 32nd Street to Access to Beach Avenue	Major Collector	City	55	28	2	No	No	No	25	V. Good	SL
SW 33rd Street to SW 34th Street	Major Collector	City	55	28	2	No	No	No	25	V. Good	SL
SW 34th Street to SW 35th Street	Major Collector	City	55	28	2	No	No	No	25	V. Good	SL
SW 24th Drive (between Anchor & Coast)	Major Collector	City	40	15	2	No	No	No	25	V. Good	No

Street Segment	Classification	Juris-diction	ROW Width	Street Width	Num-ber of travel lanes	On-Street Parking	Sidewalk	Bike Lanes	Speed Limit	Pave-ment Condi-tion	Pavement Markings
SW 11th Drive											
SW Coast Avenue to SW Fleet Dr.	Major Collector	City	40	19	2	No	No	No	15	V. Bad	No
SW Fleet Avenue to SW Galley Avenue	Major Collector	City	40		2	No	No	No	15	Bad	No
SW Galley Avenue to SW Harbor Avenue	Major Collector	City	50	12	2	No	No	No	15	Gravel	No
SW Harbor Avenue to Hwy. 101	Major Collector	City	40		2	No	No	No	15	Bad	No
SE Inlet Avenue (between S. 48th and S. 51st Streets)	Minor Collector	City	40	19	2	Shoulder	No	No	25	Good	No
SE 32nd Street											
S. Hwy 101 to East End	Minor Collector	City	50	35	2	Yes	5' South Side	No	25	V. Good	No
SW 32nd Street											
SW Anchor to SW Beach Avenue	Minor Collector	City	50	33	2	No	No	No	25	V. Bad	No
SW Beach to SW Coast Avenue	Minor Collector	City	50	27	2	No	No	No	25	Bad	No
SW Coast Avenue to S. Hwy. 101	Minor Collector	City	50	28	2	No	No	No	25	V. Good	No
SW Bard Road											
SW Coast Avenue to SW Fleet Avenue	Minor Collector	City	40	17	2	No	No	No	20	Gravel Road	No
SW Fleet Avenue to SW Harbor Avenue	Minor Collector	City	30	17	2	No	No	No	20	Gravel Road	No
SW Harbor Avenue to Hwy. 101	Minor Collector	City	30	16	2	No	No	No	20	Gravel Road	No
SW Harbor Road (SW Bard to Hwy. 101)	Minor Collector	City		20	2	Shoulder	No	No	25	V. Good	SL
SW 19th Street											
US 101 to "Chapel by the Sea"	Local Street	City		23	2	No	No	No	25	V. Good	No

Street Segment	Classification	Juris-diction	ROW Width	Street Width	Num-ber of travel lanes	On-Street Parking	Sidewalk	Bike Lanes	Speed Limit	Pave-ment Condi-tion	Pavement Markings
"Chapel by the Sea" to east end	Local Street	City		23	2	Westbound	Yes	No	25	V. Good	No
SW 14th Street											
US 101 to east end of "Factory Outlet"	Local Street	City		28	2	No	Eastbound	No	25	V. Good	Yes
East end of "Factory Outlet" to Oar St.	Local Street	City		23	2	No	No	No	25	V. Good	No
Oar Street to Fleet Street	Local Street	City		22	2	No	No	No	25	V. Good	No
SW 12th Street	Major Collector	City		23	2	Shoulder	No	No	25	V. Good	White Center Line Marking Inappro-priate
SW 9th Street (between Ebb and Fleet Streets)	Major Collector	City	40	8	2	Both Sides	No	No	25	V. Good	No
SW Ebb Avenue											
Hwy. 101 to SW 6th Street	Major Collector	City		36	2	Shoulder	No	No	25	V. Good	SL
SW 6th Street to SW 8th Street	Major Collector	City		20	2	Shoulder	No	No	25	V. Good	SL
SW 8th Street to SW 10th Plaza	Major Collector	City		20	2	No	No	No	25	V. Good	SL
SE 3rd Street											
Jetty Avenue to Neptune Avenue	Minor Collector	City	35	22	2	No	No	No	25	V. Good	No
Neptune Avenue to Port Avenue	Minor Collector	City	40	18	2	Shoulder	No	No	25	V. Good	SL
SE Port Avenue											
SE 3rd Street to North to Dead End	Minor Collector	City	40	Gravel	2	Shoulder	No	No	25	Bad	No
SE 3rd Street to SE 5th Street	Minor Collector	City	40	18	2	Shoulder	No	No	25	V. Good	No
SE 55th Street to SE 56th Street	Minor Collector	City	60	22	2	Shoulder	No	No	25	V. Good	No
SE 55th Street to WW Treatment Plant	Minor Collector	City	60	22	2	Shoulder	No	No	25	V. Good	No
SE 56th Street to SE 57th Street	Minor Collector	City	60	18	2	Shoulder	No	No	25	V. Good	No

Street Segment	Classification	Juris-diction	ROW Width	Street Width	Num-ber of travel lanes	On-Street Parking	Sidewalk	Bike Lanes	Speed Limit	Pave-ment Condi-tion	Pavement Markings
SE 8th Street to EDL Road.	Minor Collector	City	40	18	2	Shoulder	No	No	25	V. Good	No
<u>SE East Devils Lake Road</u>											
US 101 (south end) to Port Avenue	Major Collector	City	60	24	2	No	No	Bike Route	25	V. Good	2YCL
City Limits to Port Avenue	Major Collector	City	60	22	2	No	No	Bike Route	35	V. Good	2YCL
Port Avenue to US 101 (North end)	Major Collector	County	60	25	2	No	No	Bike Route	35	V. Good	2YCL
<u>NE 14th/West Devils Lake Road</u>											
US 101 (North end) to Holmes Road	Major Collector	City	60	24	2	No	No	Bike Route	35	V. Good	2YCL
NE 26th Street to NE 22nd Street	Major Collector	City	60	24	2	Shoulder	No	Bike Route	25	V. Good	2YCL/SL/FL
NE 22nd Street to NE Port Avenue	Major Collector	City		24	2	No	No	No	25	V. Good	2YCL/FL
NE Port Avenue to US 101 (Flasher at Oar Avenue)	Major Collector	City		24	2	No	No	No	25	V. Good	2YCL/SL
<u>NW 14th Street</u>											
US 101 to Harbor Avenue	Minor Collector	City	40	21	2	No	No	No	25	V. Good	No
<u>NE 6th Drive</u>											
Hwy. 101 to Devils Lake State Park Access	Minor Collector	City	50	24	2	No	No	No	25	V. Good	SL
Devils Lake State Park Access to NE Mast Avenue	Minor Collector	City	50	22	2	No	No	No	25	Good	1YCL
NE 7th Drive to NE Mast Avenue	Minor Collector	City	60	18	2	No	No	No	25	V. Good	No
<u>NW Inlet Avenue</u>											
NW 1st Street to NW 5th Street	Major Collector	City	30	24	2	No	No	Bike Route	25	V. Good	2YCL
NW 5th Street to 6th Street	Major Collector	City	30	19	2	No	No	Bike Route	25	V. Good	2YCL
NW 6th Drive to NW 6th Court	Major Collector	City	30	24	2	No	No	Bike Route	25	V. Good	2YCL

Street Segment	Classification	Juris-diction	ROW Width	Street Width	Num-ber of travel lanes	On-Street Parking	Sidewalk	Bike Lanes	Speed Limit	Pave-ment Condi-tion	Pavement Markings
NW 6th Ct. to Access to Harbor	Major Collector	City	30	23	2	No	No	Bike Route	25	V. Good	2YCL
NW 12th Street South to Access	Major Collector	City	30	22	2	No	No	Bike Route	25	V. Good	2YCL
NW Harbor Avenue											
NW 12th Street to Access West	Major Collector	City	40	22	2	No	No	Bike Route	25	V. Good	2YCL
NW 12th Street to South to Access Beach	Major Collector	City	30	30	2	No	No	Bike Route	25	V. Bad	2YCL
NW 13th Street to NW 14th Street	Major Collector	City	40	22	2	No	No	Bike Route	25	V. Good	2YCL
NW 14th Street to NW 15th Street	Major Collector	City	40	29	2	No	No	Bike Route	25	V. Good	2YCL
NW 15th Street to Access to Beach	Major Collector	City	40	30	2	Curbing	No	Bike Route	25	V. Good	2YCL
NW 16th Street to NW 17th Street	Major Collector	City	40	30	2	Curbing	No	Bike Route	25	V. Good	2YCL
NW 17th Street to NW Pacific Walk	Major Collector	City	40	30	2	Curbing	No	Bike Route	25	V. Good	2YCL
NW 18th Street to Beach Walk	Major Collector	City	40	30	2	Curbing	No	Bike Route	25	V. Good	2YCL
NW 19th Street to Fern Walk	Major Collector	City	40	30	2	Curbing	No	Bike Route	25	V. Good	2YCL
NW 20th Street to NW 21st Street	Major Collector	City	40	30	2	Curbing	No	Bike Route	25	V. Good	2YCL
NW Jetty Avenue											
NW 21st Street to NW 23rd Street	Major Collector	City	30	21	2	Yes	No	Bike Route	25	V. Good	No
NW 23rd Street to NW 25th Street	Major Collector	City	30	20	2	No	No	Bike Route	25	V. Good	2YCL
NW 26th Street to NW 25th Street	Major Collector	City	50	29	2	No	No	Bike Route	25	V. Good	SL
NW 26th Street to NW 28th Street	Major Collector	City	50	28	2	No	No	Bike Route	25	V. Good	SL
NW 28th Street to NW 30th Street	Major Collector	City	40	30	2	No	No	Bike Route	25	V. Good	SL
NW 30th Street to NW 31st Street	Major Collector	City	40	36	2	No	No	Bike Route	25	V. Good	SL
NW 31st Place to NW 33rd Street	Major Collector	City	30	24	2	No	No	Bike Route	25	V. Good	SL
NW 33rd Place to NW Inlet Avenue	Major Collector	City	40	28	2	No	No	Bike Route	25	V. Good	SL
NW 34th Street to NW 35th Street	Major Collector	City	40	27	2	No	No	Bike Route	25	V. Good	SL

Street Segment	Classification	Juris-diction	ROW Width	Street Width	Num-ber of travel lanes	On-Street Parking	Sidewalk	Bike Lanes	Speed Limit	Pave-ment Condi-tion	Pavement Markings
NW 35th Ct. to NW 35th Place	Major Collector	City	30	27	2	Both Sides	No	Bike Route	25	V. Good	SL
NW 35th Street to NW 37th Street	Major Collector	City	50	39	2	Both Sides	No	Bike Route	25	Fair	SL
NW 37th Street to NW 39th Street	Major Collector	City	50	38	2	Both Sides	No	Bike Route	25	Good	SL
<u>NE Oar Avenue</u>											
NE 10th Street to NE 11th Street	Minor Collector	City	40	21	2	No	No	No	25	V. Good	SL
NE 11th Street to NE 12th Street	Minor Collector	City	40	20	2	No	No	No	25	V. Good	SL
NE 12th Street to NE 13th Street	Minor Collector	City	40	20	2	No	No	No	25	V. Good	SL
NE 13th Street to NE 14th Street	Minor Collector	City	40	20	2	No	No	No	25	V. Good	SL
NE 14th Street to NE 15th Street	Minor Collector	City	40	20	2	No	No	No	25	V. Good	2YCL/R
NE 15th Street to NE 16th Street	Minor Collector	City	40	20	2	No	No	No	25	V. Good	No
NE 16th Street to NE 17th Street	Minor Collector	City	40	22	2	No	No	No	25	V. Good	No
NE 17th Street to NE 18th Street	Minor Collector	City	40	20	2	No	No	No	25	V. Good	No
NE 18th Street to NE 19th Street	Minor Collector	City	40	22	2	No	No	No	25	V. Good	No
NE 19th Street to NE 20th Street	Minor Collector	City	40	22	2	No	No	No	25	V. Good	No
NE 20th Street to NE 21st Street	Minor Collector	City	40	22	2	No	No	No	25	V. Good	No
NE 21st Street to NE 22nd Street	Minor Collector	City	40	22	2	No	No	No	25	V. Good	No
<u>NE Port Avenue</u>											
NE 14th Street to NE 15th Street	Minor Collector	City	20	Gravel	1	No	No	No	25	Bad	No
NE 15th Street to NE 16th Street	Minor Collector	City	40	Gravel	1	No	No	No	25	Bad	No
NE 16th Street to NE 17th Street	Minor Collector	City	40	Gravel	1	No	No	No	25	Bad	No
NE 17th Street to NE 18th Street	Minor Collector	City	40	Gravel	1	No	No	No	25	Bad	No
NE 18th Street to Access Rd. to East	Minor Collector	City	40	Gravel	1	No	No	No	25	Bad	No
NE 19th Street to NE 20th Street	Minor Collector	City	40	Gravel	1	No	No	No	25	Bad	No

Street Segment	Classification	Juris-diction	ROW Width	Street Width	Num-ber of travel lanes	On-Street Parking	Sidewalk	Bike Lanes	Speed Limit	Pave-ment Condi-tion	Pavement Markings
NE 20th Street to NE 21st Street	Minor Collector	City	40	Gravel	1	No	No	No	25	Bad	No
NE Quay Plaza (NE 21st Street to NE 22nd Street)	Minor Collector	City	60	33	2	No	Both Sides	No	25	V. Good	SL
NW 21st Street											
NW Jetty Avenue North to Hwy. 101	Major Collector	City	60	29	2	No	No	Bike Route; Jetty Harb.	25	V. Good	SL
Beach to NW Jetty Avenue South	Major Collector	City	40	37	2	No	No	No	25	V. Good	SL
Reef Avenue to Surf Avenue	Major Collector	City	40	Gravel	2	No	No	No	25	Bad	SL
NW Mast Plaza											
NW 21st Street to NW Mast Avenue	Minor Collector	City	40	36	2	No	No	No	25	V. Good	No
NW Mast Avenue to NW 22nd Street	Minor Collector	City	40	36	2	No	No	No	25	V. Good	No
NW 22nd Street											
NW Keel Avenue to NW Lee Avenue	Minor Collector	City	50	20	2	No	4' Eastbound	No	25	V. Good	SL/R
NW Lee Avenue to NW Mast Avenue South	Minor Collector	City	50	32	2	No	4' Eastbound	No	25	V. Good	SL/R
NW Mast Avenue to NW Mast Place	Minor Collector	City	70	32	2	No	4' Eastbound	No	25	V. Good	SL/R
NW Mast Place to Hwy. 101	Minor Collector	City	70	36	2	No	4' Eastbound	No	25	V. Good	SL/R
NE 22nd Street											
Hwy. 101 to NE Oar Place	Minor Collector	City	70	40	2	Both Sides	5' Eastbound	No	25	Bad	SL
NE Oar Place to NE Quay Avenue	Minor Collector	City	70	40	2	Both Sides	5' Eastbound	No	25	V. Bad	SL

Street Segment	Classification	Juris-diction	ROW Width	Street Width	Num-ber of travel lanes	On-Street Parking	Sidewalk	Bike Lanes	Speed Limit	Pave-ment Condi-tion	Pavement Markings
NE Quay Avenue to NE Quay Place	Minor Collector	City	70	40	2	Both Sides	5' Eastbound	No	20	V. Bad	SL
NE Quay P. to NE Reef Avenue South	Minor Collector	City	70	40	2	Both Sides	5' Eastbound	No	20	V. Bad	SL
NE Reef Avenue North to NE Surf Avenue	Minor Collector	City	70	40	2	Both Sides	5' Eastbound	No	20	Fair	2YCL
NE Reef Avenue South to NE Reef Avenue North	Minor Collector	City	70	40	2	Both Sides	5' Eastbound	No	25	V. Bad	2YCL
West Devils Lake Road to NE Surf	Minor Collector	City	60	25	2	No	No	No	25	V. Good	2YCL
<u>NW 25th Street</u>											
NW Jetty Avenue North to NW Jetty Avenue South	Local Street	City	40	29	2	No	No	No	25	V. Good	1YCL/R
NW Jetty South to NW Keel Avenue North	Local Street	City	40	20	2	No	No	No	25	Good	2YCL
NW Keel Avenue South to NW Lee Avenue	Local Street	City	40	20	2	No	No	No	25	V. Bad	2YCL
NW Keel Avenue North to NW Keel Avenue South	Local Street	City	40	20	2	No	No	No	25	V. Good	2YCL
NW Lee Avenue to NW Mast Avenue North	Local Street	City	40	20	2	No	No	No	25	V. Good	2YCL
NW Mast Avenue North to NW Mast Avenue South	Local Street	City	40	20	2	No	No	No	25	V. Good	2YCL
NW Mast Avenue South to NW Neptune Avenue	Local Street	City	40	20	2	No	No	No	25	V. Bad	2YCL
NW Neptune Avenue to NW Oar Place	Local Street	City	40	20	2	No	No	No	25	V. Bad	2YCL
NW Oar Avenue to Hwy 101	Local Street	City	40	27	2	No	South Side 5' Curb	No	25	V. Good	2YCL

Street Segment	Classification	Juris-diction	ROW Width	Street Width	Num-ber of travel lanes	On-Street Parking	Sidewalk	Bike Lanes	Speed Limit	Pave-ment Condi-tion	Pavement Markings
NW 26th Street											
Beach to NW Inlet Avenue	Minor Collector	City	50	40	2	Head in Parking Both Sides	No	No	25	V. Good	No
NW Jetty Avenue to NW Inlet Avenue	Minor Collector	City	50	28	2	No	No	No	25	V. Good	SL
NW Jetty Avenue to NW Keel Avenue	Minor Collector	City	50	20	2	No	No	No	25	V. Good	SL
NW Keel Avenue to NW Lee Avenue	Minor Collector	City	50	20	2	No	No	No	25	V. Good	SL
NW Lee Avenue to NW Mast Avenue South	Minor Collector	City	50	20	2	No	No	No	25	V. Good	SL
NW Mast Avenue North to NW Neptune Avenue North	Minor Collector	City	50	20	2	No	No	No	25	V. Good	SL
NW Mast Avenue South to NW Mast Avenue North	Minor Collector	City	50	20	2	No	No	No	25	V. Good	SL
NW Neptune Avenue to NW Oar Avenue North	Minor Collector	City	50	20	2	No	No	No	25	V. Good	SL
NW Oar Avenue North to NW Oar Avenue South	Minor Collector	City	50	20	2	No	No	No	25	V. Good	SL
NW Oar Avenue South to Hwy. 101	Minor Collector	City	50	20	2	No	No	No	25	V. Good	SL
NW 28th Street											
NW Inlet Avenue South to NW Jetty Avenue North	Local Street	City	30	23	2	No	No	No	25	V. Good	SL/R
NW Inlet North to NW Inlet South	Local Street	City	30		2	No	No	No	25		SL/R
NW Jetty Avenue North to NW Jetty Avenue South	Local Street	City	50	30	2	No	No	No	25	V. Good	SL/R
NW Jetty Avenue South to NW Keel Avenue	Local Street	City	50	30	2	No	No	No	25	V. Good	SL/R
NW Keel Avenue to NW Lee Avenue	Local Street	City	50	30	2	No	No	No	25	V. Good	SL/R

Street Segment	Classification	Juris-diction	ROW Width	Street Width	Num-ber of travel lanes	On-Street Parking	Sidewalk	Bike Lanes	Speed Limit	Pave-ment Condi-tion	Pavement Markings
NW Lee Avenue to NW Mast Avenue North	Local Street	City	50	30	2	No	No	No	25	V. Good	SL/R
NW Mast Avenue North to NW Mast Avenue South	Local Street	City	50	30	2	No	No	No	25	V. Good	SL/R
NW Mast Avenue South to NW Neptune Avenue North	Local Street	City	50	30	2	No	No	No	25	V. Good	SL/R
NW Neptune Avenue North to NW Neptune Avenue South	Local Street	City	50	30	2	No	No	No	25	V. Good	SL/R
NW Neptune Avenue South to NW Oar Avenue	Local Street	City	50	30	2	No	No	No	25	V. Good	SL/R
NW Oar Avenue to NW Port Avenue	Local Street	City	50	30	2	Shoulder	No	No	25	V. Good	SL/R
NW Port Avenue to Hwy. 101	Local Street	City	50	30	2	Shoulder	No	No	25	V. Good	SL/R
<u>NW 30th Street</u>											
NW Jetty Avenue to NW Keel Avenue	Minor Collector	City	40	22	2	No	No	No	25	V. Good	1YCL/R
NW Keel Avenue to NW Lee Avenue North	Minor Collector	City	40	22	2	North Shoulder	No	No	25	Fair	1YCL/R
NW Lee Avenue North to NW Lee Avenue South	Minor Collector	City	40	22	2	North Shoulder	No	No	25	V. Good	1YCL/R
NW Lee Avenue South to NW Marine Avenue	Minor Collector	City	40	22	2	No	No	No	25	V. Good	1YCL/R
NW Marine Avenue to NW Mast Avenue	Minor Collector	City	40	22	2	No	No	No	25	V. Good	1YCL/R
NW Mast Avenue North to NW Neptune Avenue South	Minor Collector	City	40	22	2	No	No	No	25	V. Good	1YCL/R
NW Mast Avenue South to NW Mast Avenue North	Minor Collector	City	40	22	2	No	No	No	25	V. Good	1YCL/R
NW Neptune North to NW Oar Avenue South	Minor Collector	City	40	22	2	No	No	No	25	V. Good	1YCL/R

Street Segment	Classification	Juris-diction	ROW Width	Street Width	Num-ber of travel lanes	On-Street Parking	Sidewalk	Bike Lanes	Speed Limit	Pave-ment Condi-tion	Pavement Markings
NW Neptune South to NW Neptune North	Minor Collector	City	40	22	2	No	No	No	25	V. Good	1YCL/R
NW Oar Avenue North to NW Port Avenue South	Minor Collector	City	40	22	2	No	No	No	25	V. Good	1YCl/R
NW Oar Avenue South to NW Oar Avenue North	Minor Collector	City	40	22	2	No	No	No	25	V. Good	1YCL/R
NW Port Avenue South to NW Port Drive	Minor Collector	City	40	22	2	No	No	No	20	V. Good	No
NW Port Drive to Hwy. 101	Minor Collector	City	40	22	2	No	No	No	20	V. Good	No
<u>NE Holmes Road</u>											
Hwy. 101 to NE Surf Avenue	Minor Collector	City	60	26	2	Shoulder	No	Bike Route	25	V. Good	SL/FL
NE Surf to NE Tide	Minor Collector	City	60	26	2	Shoulder	No	Bike Route	25	V. Good	SL/FL
NE Tide to NE Union Avenue	Minor Collector	City	60	26	2	Shoulder	No	Bike Route	25	V. Good	SL/FL
NE Union Avenue to NE Voyage Avenue	Minor Collector	City	60	26	2	Shoulder	No	Bike Route	25	V. Good	SL/FL
NE Voyage to West Lake Road	Minor Collector	City	60	26	2	Shoulder	No	Bike Route	25	V. Good	SL/FL
<u>NW 39th Street</u>											
NW Jetty Avenue North to NW Jetty Avenue South	Major Collector	City	40	20	2	No	No	Bike Route	20	V. Good	No
NW Jetty Avenue South to NW Keel Avenue	Major Collector	City	40	20	2	No	No	Bike Route	20	V. Good	No
NW Keel Avenue to NW Lee Avenue	Major Collector	City	40	20	2	No	No	Bike Route	20	V. Good	No
NW Lee Avenue to NW Mast Avenue	Major Collector	City	40	20	2	No	No	Bike Route	20	V. Good	No
NW Mast Avenue to NW Port Avenue	Major Collector	City	40	19	2	No	No	Bike Route	20	V. Good	No
NW Port Avenue to Hwy. 101	Major Collector	City	40	20	2	No	No	Bike Route	20	V. Good	No

Street Segment	Classification	Juris-diction	ROW Width	Street Width	Num-ber of travel lanes	On-Street Parking	Sidewalk	Bike Lanes	Speed Limit	Pave-ment Condi-tion	Pavement Markings
<u>Logan Road</u>											
North of Northern	Major Collector	City	4	40	4	No	No	No	35	V. Good	Yes
South of northern Shopping Center	Major Collector	City	4	48	4	No	6' North Bound	No	35	V. Good	Yes
South of Safeway Drive	Major Collector	City	4	56	4	No	6' Both Sides	No	35	V. Good	Yes

2YCL = Double Yellow Center Line
1YCL = Yellow Center Line
SL = Skip Line
FL = Fog Line
R = Reflectors

APPENDIX C

LEVEL OF SERVICE DEFINITIONS

TABLE 1

UNSIGNALIZED LEVEL OF SERVICE DEFINITION

LEVEL OF SERVICE	DESCRIPTION
A	Operations with reserve capacity greater than 400 passenger cars per hour; little or no delay.
B	Operations with reserve capacity of 300 - 399 passenger cars per hour; short traffic delays.
C	Operations with reserve capacity of 200 - 299 passenger cars per hour; average traffic delay.
D	Operations with reserve capacity of 100 - 199 passenger cars per hour; long traffic delays.
E	Operations with reserve capacity of 0 - 99 passenger cars per hour; long traffic delays.
F	Operations where demand volume exceeds capacity of lane, causing extreme delays and queuing.

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

TABLE 2

SIGNALIZED LEVEL OF SERVICE DEFINITION

LEVEL OF SERVICE	Description
A	Operations with very low delay - less than 5 seconds per vehicle; occurs when most vehicles arrive during green phase, with most vehicles not stopping at all; short cycle lengths may contribute to low delay.
B	Operations with delay from 5.1 to 15 seconds per vehicle; occurs with good progression and/or short cycle lengths; more vehicles stop than with LOS A.
C	Operations with delay from 15.1 to 25 seconds per vehicle; occurs with fair progression and/or longer cycle lengths; individual cycle failures may begin to appear at this level; the number of vehicles stopping is significant at this level, although many vehicles still pass through the intersection without stopping.
D	Operations with delay from 25.1 to 40 seconds per vehicle; at this LOS, the influence of congestion becomes more noticeable; longer delays result from a combination of unfavorable progression, long cycle lengths, or high volume/capacity (v/c) ratios; many vehicles stop, and the proportion of vehicles not stopping declines; individual cycle failures are noticeable.
E	Operations with a delay of 40.1 to 60 seconds per vehicle; upper limit reflects capacity of intersection; high delay indicates poor progression, long cycle lengths, and high v/c ratios; individual cycle failures are frequent.
F	Operations with delay in excess of 60 seconds per vehicle; condition occurs from over-saturation, when arrival flow rates exceed capacity of the intersection; may also occur with high v/c ratios less than 1.0 with many individual cycle failures; poor progression and long cycle lengths may also contribute to high delay.

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

APPENDIX D

YEAR 2015 POPULATION/EMPLOYMENT PROJECTIONS

Population Data TAZ

	1992						2015					
	(Occupied)			Seasonal /	Motel		(Occupied)			Seasonal /	Motel	
	SFDU	MFDU	Population	Vacant DU's	Rooms	Peak Pop.	SFDU	MFDU	Population	Vacant DU's	Rooms	Peak Pop.
1	50	17	144	124		429	74	17	199	149		542
2	4		9	1		12	154		354	176		759
3	16		37			37	166		382	200		842
4	7	12	37	41		131	198	187	773	405		1705
5	78		179	60		317	94		216	78		396
6	9		21		187	451	25	136	289	166	598	2046
7			0			0			0			0
8			0			0			0			0
9	54		124	28		189	74		170	53		292
10	74	9	186	42		282	93	90	367	42		464
11	5		12		8	30	6		14	6	258	621
12	5		12	2		16	1		2	2	200	467
13	5		12			12	0		0			0
14	81	60	288	11	3	321	110	60	355	44	3	463
15	101		232	67	5	398	99		228	67	5	393
16	42	60	199	18	314	962	41	60	196	18	314	960
17	92	45	288	105	12	557	87	45	277	105	12	546
18	84	22	231	50	17	385	82	22	226	50	17	380
19	21	35	108	30		177	95	65	329	30		398
20	78	30	230		10	253	95	30	270	19	10	336
21	12		28	10		51	20	100	216	10		239
22	43	40	167	56		296	42	40	165	56		293
23	7		16			16	20		46	14		78
24	34		78			78	48		110	2	21	163
25			0			0			0			0
26	119	7	286	30		355	126	7	302	38		389
27	38		87	5		99	72		166	29		232
28	30		69	5		81	48		110	24		166
29	34	37	141	89		346	33	37	139	89		344
30	111	37	318	45	166	804	109	37	314	45	166	799
31	50	11	134	40	16	263	49	11	131	40	16	260
32	34		78		30	147	32		74		30	143
33	41	14	118	24	285	829	39	14	114	24	285	824
34	73		168	56		297	84		193	69		352

Lincoln City Population Data

	1992						2015					
	(Occupied)			Seasonal /	Motel		(Occupied)			Seasonal /	Motel	
TAZ	SFDU	MFDU	Population	Vacant DU's	Rooms	Peak Pop.	SFDU	MFDU	Population	Vacant DU's	Rooms	Peak Pop.
35	19		44	14		76	26		60	22		110
36	5		12		63	156	5		12		63	156
37	52	15	145	18	43	285	51	15	143	18	43	283
38	148		340	55		467	146	60	438	55		564
39	26	15	85	53		207	25	35	117	53		239
40	28		64		10	87	26		60		10	83
41	47	17	137	53	5	270	46	17	135	53	5	268
42	5		12	6		25	4		9	6		23
43	23	40	121			121	34	80	214	12		242
44	5	41	81	4		90	26	41	130	41		224
45	51		117	61		258	53		122	66		274
46	45	21	139	20		185	48	21	146	25		204
47			0	2		5			0	2		5
48	47	96	271	105		513	66	123	361	126	20	697
49	8		18	17		58	31	100	241	40		333
50	93	19	246	1		249	116	152	525	76		700
51	77		177	37	331	1024	75		173	37	331	1019
52	34		78	8		97	64		147	59		283
53	13		30	4	9	60	12		28	4	182	455
54	15		35	15	4	78	14		32	15	4	76
55	25		58	40		150	20		46	40		138
56	22		51	24	121	384	18		41	24	121	375
57	58	40	201	47		310	57	40	199	54		323
58	2		5			5	60		138	9	130	458
59	146	11	355	88		557	138	11	336	88		539
60	25		58	3		64	53		122	33		198
Total	2451	751	6914	1614	1639	14396	3430	1653	10699	3008	2844	24159
	Annual Growth Rate (resident pop.)					1.91%	Annual Growth Rate (seasonal pop.)					2.27%
	Percent Population Change					35.40%	Percent Population Change					40.41%

Lincoln City Employment Estimates

Year 1992

TAZ	Commercial	Office	Industrial	Warehouse	Medical/ Hospital	Fire	Government	School	Misc.	Students
1										
2										
3	10									
4		70								
5										
6	100									
7	94									
8	105									
9										
10		2								
11	2									
12	18									
13	72	11	12							
14										
15	6	15								
16	30									
17	45	5								
18	56	18								
19	8									
20	35	3			11					
21					170					
22	29	3				2				
23	21									
24								36		328
25	34						5			
26										
27										
28										
29	58	6					7			
30	53	7	5							
31	57									
32	13	40						32		278
33	46									
34	3									
35										
36	4									
37	45									
38			7				14			
39							48			
40	45	15								
41	33	12					39			

Lincoln City Employment Estimates

Year 1992

TAZ	Commercial	Office	Industrial	Warehouse	Medical/ Hospital	Fire	Government	School	Misc.	Students
42	164									
43			6				12			
44	48		10							
45	80	20							25	
46										
47			26							
48	44									
49										
50	15									
51	151	12								
52								50		504
53	46						2			
54	51									
55										
56	51	14								
57	41							75		730
58	3						4			
59	26									
	14									
	1756	253	66	0	181	2	131	193	25	1840

Total Employment 2607

Lincoln City Employment Estimates

Year 2015

TAZ	Commercial	Office	Industrial	Warehouse	Medical/ Hospital	Fire	Government	School	Misc.	Students
1										
2										
3	20									
4	32	80								
5										
6	255									
7	109									
8	120									
9										
10		2								
11	27									
12	118									
13	150	15	16							
14										
15	10	18								
16	30									
17	55	8								
18	66	22								
19	16									
20	55	5			25					
21					233					
22	39	5				8				
23	68									
24								45		410
25	39						8			
26										
27										
28										
29	68	8					9			
30	63	9	7							
31	57									
32	30	45						40		348
33	60									
34	13									
35										
36	14									
37	50									
38			10				17			
39		75				8	68			
40	65	18								
41	53	14					50			

Lincoln City Employment Estimates

Year 2015

TAZ	Commercial	Office	Industrial	Warehouse	Medical/ Hospital	Fire	Government	School	Misc.	Students
42	174									
43			130				15			
44	68		70							
45	111	29							35	
46										
47			70							
48	74									
49										
50	45									
51	217	15								
52								63		630
53	110						4			
54	81									
55										
56	90	16								
57	76							94		913
58	34						6			
59	38									
	16									
	2816	384	303	0	258	16	177	241	35	2300

Total Employment 4230

APPENDIX E

DOCUMENTS - SPECIFICATION & DESIGN

other conditions make continuance or conformance to existing streets impractical. (Ord. 78-32 § 3.010(2)(a))

16.12.030 Streets—Minimum right-of-way and roadway widths.

Unless otherwise approved by the planning commission or indicated on a development plan, the width of streets and roadways in feet shall not be less than the minimum shown in the following table.

Type of Street	Minimum Right-of-Way (in feet)	Minimum Roadway (in feet)
Major streets	80 to 100	varies
Collector streets	60	40
Other lesser streets	50	36
Streets ending in a permanent cul-de-sac of length of 250' or less (center to intersection center)	50	32
Radius for turnaroumd at end of cul-de-sac	50	43
Radius for turnaround at end of cul-de-sac street of 250' length or less	50	41
Alley	20	20

(Ord. 78-32 § 3.010(2)(b))

16.12.040 Streets—Reserve strips.

Reserve strips or street plugs controlling access to streets will not be approved unless such strips are necessary for protection of the public welfare or of substantial property rights or both, and in no case unless the control and disposal of the land composing such strips is placed definitely within the jurisdiction of the city under conditions approved by the planning commission. (Ord. 78-32 § 3.010(2)(c))

16.12.050 Streets—Alignment.

All streets, other than minor streets or culs-de-sac, shall, so far as practical, be in alignment with existing streets by continuations of the centerlines thereof. In no case shall the staggering of streets make "T" intersections so designed that a dangerous jog is produced. Jogs of less than one hundred feet on such streets, measured along the centerline of the intersected street, must be adjusted by curves or diagonals so that the alignment across the street is continuous. (Ord. 78-32 § 3.010(2)(d))

16.12.060 Streets—Future expansion.

A. Where a subdivision or partition adjoins undeveloped property, streets which, in the findings of the planning commission, should be continued in the event of the subdivision or partitioning of the undeveloped property will be required to be provided through the boundary lines of the tract.

B. Reserve strips and street plugs may be required to preserve the objectives of street extensions. Reserve strips and street plugs shall be deeded to the city or county, as directed, prior to final plat or map approval.

C. If, in the opinion of the city engineer, a traffic, pedestrian or safety hazard temporarily exists by the construction of a dead-end street, he may direct that a barricade of adequate design

From Residential Streets - 1974 -
objec ves, Principles & design Considerations

Principles

The following statements are presented as principles in related categories:

General Principles

Major elements of the street system may be used to help define and buffer different land use areas enhancing their identity and cohesiveness.

- Street and pedestrian circulation pattern in a new residential area should be compatible with objectives established by a community's major street plan.

- Planned layout should minimize overall length of streets.

Access points to major highways, thoroughfares, and arterial streets should be limited in number, given special design consideration, and whenever possible located where other features are not competing for driver attention. Cul-de-sacs and courts enhance privacy and the lack of through-traffic improves safety.

- A residential area should be conveniently accessible from major streets and highways.

- Driveway entrances should be avoided on arterial streets and wherever possible on collector streets.

- Through-traffic on minor residential streets should be avoided.

- Residential streets should provide safe and convenient access to housing.

Paved access must be available to fire, ambulance, and police vehicles to within 100 feet of the principal entrances to dwellings. Closer access, for infrequent use, may be across unpaved areas.

- All dwellings must be accessible by emergency and service vehicles.

Safety Principles

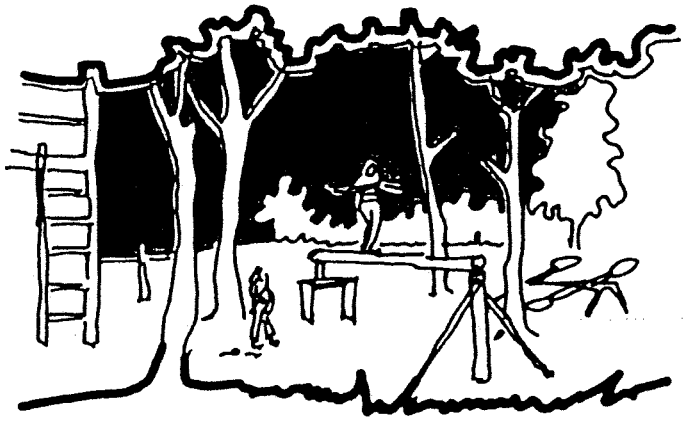
- Assure necessary lighting along streets and walkways.

The need for lighting may also be minimized by imaginative design wherever possible.

- Use of signs should be minimized and signposts should be unobtrusive.

- Informational signs should not compete with traffic control signs for driver attention.

- Use of break-away street furniture should be considered wherever possible and should be grouped for aesthetic as well as safety values.



Children will use streets to play if no alternative plan is provided for them

- Sight distances should be consistent with probable traffic speed, terrain, alignments, and climatic extremes.

- Separate pedestrian, bicycle, and vehicular traffic.

The surest way to improve pedestrian safety is to remove pedestrian traffic from areas of potential conflict with automobiles.

- Limit through-traffic on residential streets.

Street planning and dwelling unit siting should be coordinated to reduce the incidence of housing on through-streets.

- Assure visibility of parks, play areas, and interior block open spaces from the street.

Design Principles

- Horizontal and vertical street alignments should relate to the natural contours of the site insofar as is practical and should be consistent with other design objectives.

- Horizontal and vertical alignment of streets should be selected to minimize grading quantities.

- Wherever possible street layouts should be planned to avoid excessive runoff concentration and the need for storm sewers.

- Streets crossing drainageways inevitably will function as dams, and should be designed to minimize adverse backwater effects, scour, and erosion.

Streets crossing drainageways often may be improved advantageously as dams, providing an urban pond which can enhance the environment and the neighborhood, as well as provide some flood storage to help attenuate peak runoff flows. Water quality and other factors must be considered in the decision equation. Reduced area for street pavement is only one source of potential economy; others should be considered. Small storm sewers are expensive in relation to their capacity, both to construct and to maintain, and often can be avoided by well-designed street layout.

- Street planning should relate to overall community planning.

Places, lanes, and cul-de-sacs should provide direct access to residential units; subcollectors may provide more direct access to higher density uses such as townhouse or apartment clusters—they may be used also as scenic drives and to locate minor retail and service facilities. Collector and arterial streets are suitable for the location of neighborhood or community level retail and service facilities; they provide access for schools, mid-rise, and highrise apartment structures.

- Pavement edge treatments other than curb and gutter may be used where conditions permit adequate drainage and the roadway base will not be adversely affected.

Elimination of curbs will permit use of very slight longitudinal roadway gradients. In such practice, the roadway crown assures lateral roadway drainage to roadside or mid-block swales which can effectively provide runoff detention storage and sub-base drainage. The importance of detention storage for runoff management is increasing as urban areas expand.

Intersections

- Whenever possible, residential street layouts should be planned to avoid four-way intersections.

- Residential street widths normally should be the minimum consistent with safety and adequate fulfillment of street function. Pedestrian accidents are somewhat proportional to street crossing travel distance.

The total area of residential street pavements bears a direct relationship not only to initial cost but also to amortization and maintenance costs.

- Paved area within intersections should be minimized.

Paved area generally should be minimized insofar as practical to increase permeable soil area and open green space within the community.

- Oblique intersections should be avoided.

- Safe sight distances at intersections should be assured.

- Turning lanes at heavily traveled intersections should be provided.

- To the extent feasible, the number of street intersections should be minimized.

Large corner radii are a temptation to increase speed where visibility is poorest and conflicts are most likely. Residential street corner radii of about 15-20 feet have generally been found effective.

- Large corner radii should be avoided.

Intersections and driveways on the inside of a curve should be avoided particularly.

- Wherever possible, intersections on curves should be avoided.

Parking

The relative costs of off-street and on-street parking should be carefully explored. Relative excavation quantities, runoff alternatives, maintenance costs, and percent of publicly owned land are important considerations.

- A balance between off-street and on-street parking should be established.

- Dwelling unit entrances should relate to parking locations to assure convenient and safe access.

- To the extent feasible, the number of street intersections should be minimized.

Large corner radii are a templation to increase speed where visibility is poorest and conflicts are most likely. Residential street corner radii of about 15-20 feet have generally been found effective.

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Intersections and driveways on the inside of a curve should be avoided particularly.

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Parking

The relative costs of off-street and on-street parking should be carefully explored. Relative excavation quantities, runoff alternatives, maintenance costs, and percent of publicly owned land are important considerations.

- A balance between off-street and on-street parking should be established.

- Dwelling unit entrances should relate to parking locations to assure convenient and safe access.

- Large parking areas should be subdivided by meaningful and maintainable planting strips, bays, and islands to provide visual screening and thereby reduce adverse impacts on the aesthetic value of the landscape.

Plant selection should consider size at maturity, seasonal foliage differences, and maintenance needs including feeding, pruning, spraying, irrigation, and necessary replacement frequency.

- Parking should be adequate for both residents and guests.

The neighborhood layout should assure parking on collector streets will be inconvenient.

Pedestrian and Bicycle Paths

- Pedestrian access to schools, shopping, and existing or possible public transportation load points should be convenient.

Often it will be advantageous for reasons of public convenience, safety, initial and maintenance costs, ease and speed of access, and optimized land use to route pedestrian traffic outside of street rights-of-way.

- Pedestrian and bicycle-way alignments should have a reasonable relationship to foreseeable movement desires, parking, and community facilities, and should be safe, secure, and attractive.

As public transportation assumes a significant role in areas where it has been nonexistent, serious consideration should be given to future fulfillment of passenger needs for shelter, and secure bicycle storage at public transportation loading points. Neighborhood planners should be thinking in terms of how such facilities might be provided at reasonable cost and without adverse aesthetic impact. Locations might be preselected and protected by appropriate easements, and also landscaped in anticipation of future needs.

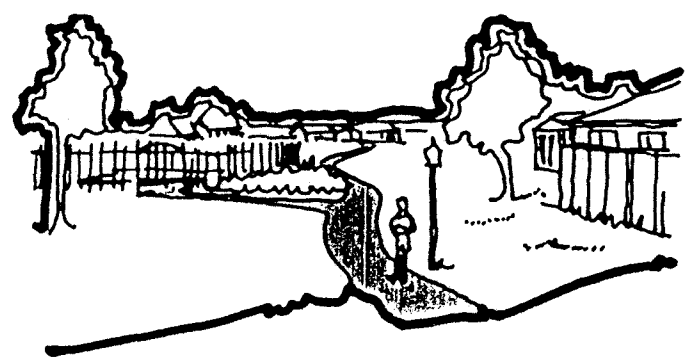
One square mile of residential property often contains as much as 44 miles of sidewalk paralleling roadway pavements—currently about a $500,000 investment. The need for and the benefits from sidewalk investment on minor residential streets obviously should be carefully examined. Sidewalks should be eliminated where they are made unnecessary by an alternative pedestrian system with low traffic hazards. Installation of sidewalks may increase the impervious area of a land development by approximately 3 percent, which could have significance in urban drainage planning.

Pedestrian walks should be provided to improve or assure public access at locations offering unusual overlooks or other particularly interesting physical features.

- Potential pedestrian, bicycle, and vehicular conflicts should be minimized.

- Pedestrian and bicycle travel routes should be selected to have minimum practical change in grade (elevation) throughout their lengths.

- Provision of streetside sidewalks should be a response to need rather than to arbitrary policy.



Paths and sidewalks should connect destinations

APPENDIX F

HOME INTERVIEW SURVEY RESULTS

TABLE E-1
LOCATION OF WORK BY LINCOLN CITY RESIDENTS
Lincoln City Transportation Plan
1992

Hwy. 101 area through the Delake District	16%
Hwy. 101 area through the Nelscott District	6%
Hwy. 101 area through Taft District	9%
Hwy. 101 area through Cutler City District	2%
Hwy. 101 area through Oceanlake District	15%
Hwy. 101 area through North Lincoln City	19%
Road's End	5%
At home (Lincoln City)	1%
City Center (Lincoln City)	1%
East Devil's Lake Road	1%
Subtotal (Lincoln City)	75%
Newport	5%
Portland	4%
Lincoln County	3%
Gleneden	3%
Salishan	2%
McMinnville	1%
Salem	1%
Depoe Bay	1%
Tigard	1%
Monmouth	1%
Seattle	1%
Otter Crest	1%
South Port	1%
TOTAL	100%

Source: Telephone Interview

TABLE E-2
LOCATION OF SHOPPING BY LINCOLN CITY RESIDENTS
Lincoln City Transportation Plan
1992

	Groceries and Convenience	Clothing and Other Comparison Items
Factory stores of Lincoln City	0%	17%
Hwy. 101 area through Delake District	18%	5%
Hwy. 101 area through Nelscott District	2%	1%
Hwy. 101 area through Taft District	7%	2%
Hwy. 101 area through Cutler City District	2%	2%
Hwy. 101 area through Oceanlake District	11%	9%
Hwy. 101 area through North Lincoln City	40%	16%
Road's End	14%	7%
Other places in Lincoln City	2%	0%
Subtotal (Lincoln City)	96%	59%
Salem	0%	12%
Portland	0%	10%
Newport	4%	9%
Mail order	0%	3%
Longview	0%	1%
Eugene	0%	1%
McMinnville	0%	1%
Hillsboro	0%	1%
Other	0%	3%
TOTAL	100%	100%

APPENDIX G

CRITERIA FOR STREET LIGHTING DEVELOPMENT

FORM I

EVALUATION FORM FOR NON-CONTROLLED ACCESS FACILITY LIGHTING

CLASSIFICATION FACTOR	RATING 1	2	3	4	5	UNLIT WEIGHT (A)	LIGHTED WEIGHT (B)	DIFF. (A - B)	SCORE [RATING X (A - B)]
Geometric Factors									
No. of lanes	4 or less	-	6	-	8 or more	1.0	0.8	0.2	
Lane Width	> 12'	12'	11'	10'	< 10'	3.0	2.5	0.5	
Median Openings Per Mile	< 4.0 or one-way operation	4.0 - 8.0	8.1 - 12.0	12.0 - 15.0	> 15.0 or no access control	5.0	3.0	2.0	
Curb Cuts	< 10%	10-20%	20-30%	30-40%	> 40%	5.0	3.0	2.0	
Curves	< 3.0°	3.1 - 6.0°	6.1 - 8.0°	8.1 - 10.0°	> 10°	13.0	5.0	8.0	
Grades	< 3%	3.0 - 3.9%	4.0 - 4.9%	5.0 - 6.9%	7% or more	3.2	2.8	0.4	
Sight Distance	> 700'	500 - 700'	300 - 500'	200 - 300'	< 200'	2.0	1.8	0.2	
Parking	prohibited both sides	loading zones only	off-peak only	permitted one side	permitted both sides	0.2	0.1	0.1	
							Geometric Total		
Operational Factors									
Signals	all major intersections signalized	substantial majority of intersections signalized	most major intersections signalized	about half the intersections signalized	frequent non-signalized intersections	3.0	2.8	0.2	
Left Turn Lane	all major intersections or one-way operation	substantial majority of intersections	most major intersections	about half the major intersections	infrequent turn bays or undivided streets	5.0	4.0	1.0	
Median Width	30'	20 - 30'	10 - 20'	4 - 10'	0 - 4'	1.0	0.5	0.5	
Operating Speed	25 or less	30	35	40	45 or greater	1.0	0.2	0.8	
Pedestrian Traffic at Night (peds/mi)	very few or none	0 - 50	50 - 100	100 - 200	> 200	1.5	0.5	1.0	
							Operational Total		
Environmental Factors									
% Development	0	0 - 30%	30 - 60%	60 - 90%	100%	0.5	0.3	0.2	
Predominant Type Development	undeveloped or back-up design	residential	half residential &/or commercial	industrial or commercial	strip industrial or commercial	0.5	0.3	0.2	
Setback Distance	> 200'	150 - 200'	100 - 150'	50 - 100'	< 50	0.5	0.3	0.2	
Advertising or Area Lighting	none	0 - 40%	40 - 60%	60 - 80%	essentially continuous	3.0	1.0	2.0	
Raised Curb Median	none	continuous	at all intersections	at signalized intersections	a few locations	1.0	0.5	0.5	
Crime Rate	extremely low	lower than city average	city average	higher than city average	extremely high	1.0	0.5	0.5	
							Environmental Total		
Accidents									
Ratio of Night-to-Day Accident Rates	< 1.0	1.0 - 1.2	1.2 - 1.5	1.5 - 2.0	2.0*	10.0	2.0	8.0	
							Accident Total		

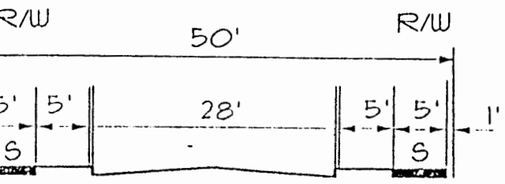
*Continuous lighting warranted.

GEOMETRIC TOTAL = _____
OPERATIONAL TOTAL = _____
ENVIRONMENTAL TOTAL = _____
ACCIDENT TOTAL = _____
SUM = _____ POINTS
WARRANTING CONDITION = 85 points

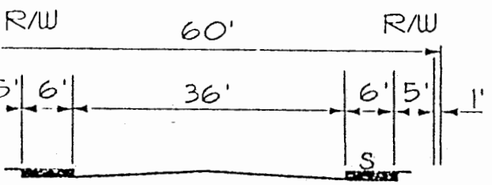
REF: ROADWAY LIGHTING HANDBOOK, U.S. DOT, DECEMBER 1979.

GEND

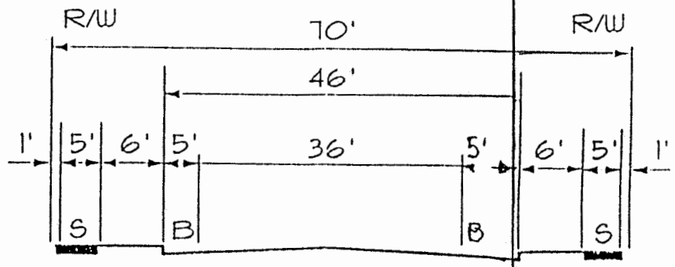
BIKELANE
SIDEWALK
= RIGHT OF WAY LINE



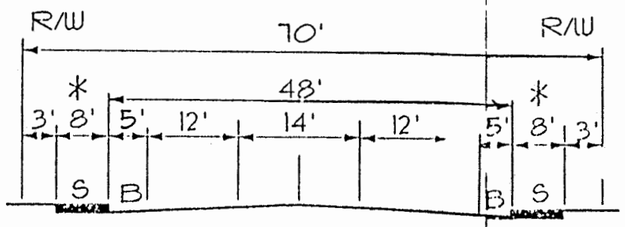
A - LOCAL RESIDENTIAL



B - COLLECTOR



C- COLLECTOR WITH BIKEWAYS

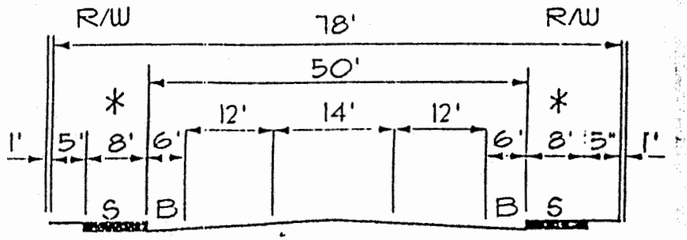


D- COLLECTOR WITH BIKE-WAYS & CENTER LEFT TURN LANE

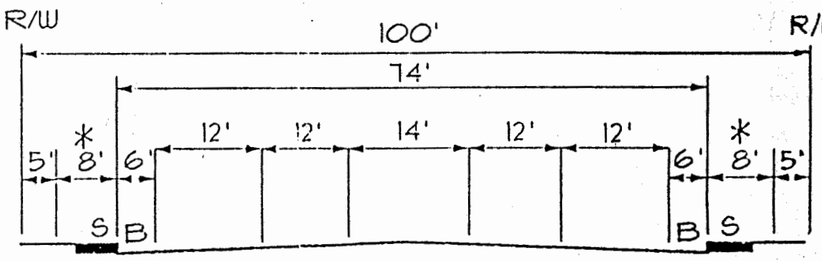
NOT TO SCALE

* IN COMMERCIAL AREAS, SIDEWALK IS 8 FEET WIDE ADJACENT TO CURB. ALL OTHER LOCATIONS, SIDEWALK IS 5 FEET WIDE LOCATED FIVE FEET FROM THE CURB FACE, AND FOR MAJOR ARTERIALS, THE SIDEWALK IS 6 FEET WIDE.

DAVID EVANS AND ASSOCIATES, INC.



E - MINOR ARTERIAL WITH BIKEWAYS



F - MAJOR ARTERIAL WITH BIKEWAYS

Appendix A

ODOT STREET DESIGN STANDARDS

LINCOLN CITY

FORM 2

EVALUATION FORM FOR INTERSECTION LIGHTING

CLASSIFICATION FACTOR	RATING 1	2	3	4	5	UNLIT WEIGHT (A)	LIGHTED WEIGHT (B)	DIFF. (A - B)	SCORE [RATING X (A - B)]
Geometric Factors									
Number of Legs		3	4	5	6 or more (including traffic circles)	3.0	2.5	0.5	
Approach Lane Width	> 12'	12'	11'	10'	< 10'	3.0	2.5	0.5	
Channelization	no turn lanes	left turn lanes on major legs	left turn lanes on all legs, right turn lanes on major legs	left and right turn lanes on major legs	left and right turn lanes on all legs	2.0	1.0	1.0	
Approach Sight Distance	> 700'	500-700'	300-500'	200-300'	< 200'	2.0	1.8	0.2	
Grades on Approach Streets	< 3%	3.0 - 3.9%	4.0 - 4.9%	5.0 - 6.9%	7% or more	3.2	2.8	0.4	
Curvature on Approach Legs	< 3.0°	3.0 - 6.0°	6.1 - 8.0°	8.1 - 10.0°	> 10°	13.0	5.0	8.0	
Parking in Vicinity	prohibited both sides	loading zones only	off-peak only	permitted one side only	permitted both sides	0.2	0.1	0.1	
							Geometric Total		
Operational Factors									
Operating Speed on Approach Legs	25 mph or less	30 mph	35 mph	40 mph	45 mph or greater	1.0	0.2	0.8	
Type of Control	all phases signalized (incl. turn lane)	left turn lane signal control	through traffic signal control only	4-way stop control	stop control to minor legs or no control	3.0	2.7	0.3	
Channelization	left and right signal control	left and right turn lane signal control on major legs	left turn lane signal control on all legs	left turn lane signal control on major legs	no turn lane control	3.0	2.0	1.0	
Level of Service (Load Factor)	A 0.0	B 0-0.1	C 0.1 - 0.3	D 0.3 - 0.7	E 0.7 - 1.0	1.0	0.2	0.8	
Pedestrian Volume (peds/hr crossing)	very few or none	0-50	50-100	100-200	> 200	1.5	0.5	1.0	
							Operational Total		
Environmental Factors									
Percent Adjacent Development	0	0-30%	30-60%	60-90%	100%	0.5	0.3	0.2	
Predominant Development near Intersection	undeveloped	residential	50% residential 50% industrial or commercial	industrial or commercial	strip industrial or commercial (no circuity)	0.5	0.3	0.2	
Lighting in Immediate Vicinity	none	0-40%	40-60%	60-80%	essentially continuous	3.0	1.5	1.5	
Crime Rate	extremely low	lower than city average	city average	higher than city average	extremely high	1.0	0.5	0.5	
							Environmental Total		
Accidents									
Ratio of night-to-day Accident Rates	1.0	1.0-1.2	1.2-1.5	1.5-2.0	2.0*	10.0	2.0	8.0	
							Accident Total		

*Intersection lighting warranted.

GEOMETRIC TOTAL = _____
OPERATIONAL TOTAL = _____
ENVIRONMENTAL TOTAL = _____
ACCIDENT TOTAL = _____
SUM = _____ POINTS
WARRANTING CONDITION = 75 points

RE: ROADWAY LIGHTING HANDBOOK, U.S. DOT, DECEMBER 1979.

FORM 3

EVALUATION FORM FOR CONTROLLED ACCESS FACILITY
(FREEWAY) LIGHTING

CLASSIFICATION FACTOR	RATING 1	2	3	4	5	UNLIT WEIGHT (A)	LIGHTED WEIGHT (B)	DIFF. (A - B)	SCORE [RATING X (A - B)]
Geometric Factors									
Number of Lanes	4		6		≥ 8	1.0	0.8	0.2	
Lane Width	> 12'	12'	11'	10'	≤ 9'	3.0	2.5	0.5	
Median Width	> 40'	24-39'	12-23'	4-11'	0-3'	1.0	0.5	0.5	
Shoulders	10'	8'	6'	4'	0'	1.0	0.5	0.5	
Slopes	≥ 8:1	6:1	4:1	3:1	2:1	1.0	0.5	0.5	
Curves	0-1/2°	1/2-1°	1-2°	2-3°	3-4°	13.0	5.0	8.0	
Grades	< 3%	3 - 3.9%	4 - 4.9%	5 - 6.9%	> 7%	3.2	2.8	0.4	
Interchange Frequency	4 miles	3 miles	2 miles	1 mile	< 1 mile	4.0	1.0	3.0	
							Geometrk Total		
Operational Factors									
Level of Service (any dark hour)	A	B	C	D	E	6.0	1.0	5.0	
							Operational Total		
Environmental Factors									
% Development	0%	25%	50%	75%	100%	3.5	0.5	3.0	
Offset to Development	200'	150'	100'	50'	≤ 50'	3.5	0.5	3.0	
							Environmental Total		
Accidents									
Ratio of Night-to-Day Accident Rates	1.0	1-1.2	1.2 - 1.5	1.5 - 2.0	2.0*	10.0	2.0	8.0	
							Accident Total		

*Continuous lighting warranted.

GEOMETRIC TOTAL = _____
OPERATIONAL TOTAL = _____
ENVIRONMENTAL TOTAL = _____
ACCIDENT TOTAL = _____
SUM = _____ POINTS
WARRANTING CONDITION = 95 points

REF: ROADWAY LIGHTING HANDBOOK, U.S. DOT, DECEMBER 1979.

FORM 4

EVALUATION FORM FOR INTERCHANGE LIGHTING

CLASSIFICATION FACTOR	RATING 1	2	3	4	5	UNLIT WEIGHT (A)	LIGHTED WEIGHT (B)	DIFF. (A - B)	SCORE [RATING X (A - B)]
Geometric Factors									
Ramp Types	Direct	Diamond	Button Hooks Cloverleafs	Trumpet	Scissors and Left-side	2.0	1.0	1.0	_____
Cross-Road Channelization	none		continuous		at interchange intersections	2.0	1.0	1.0	_____
Frontage Roads	none		one-way		two-way	1.5	1.0	0.5	_____
Freeway Lane Widths	> 12'	12'	11'	10'	< 10'	3.0	2.5	0.5	_____
Freeway Median Widths	> 40'	34 - 40'	12 - 24'	4 - 12'	< 4'	1.0	0.5	0.5	_____
No. Freeway Lanes	4 or less		6		8 or more	1.0	0.8	0.2	_____
Main Lane Curves	< 1/2°	1-2°	2-3°	3-4°	> 4°	13.0	5.0	8.0	_____
Grades	3%	3 - 3.9%	4 - 4.9%	5 - 6.9%	7% or more	3.2	2.8	0.4	_____
Sight Distance Cross Road Intersection	> 1000'	700 - 1000'	500 - 700	400 - 500'	< 400'	2.0	1.8	0.2	_____
							Geometric Factors		==========
Operational Factors									
Level of Service (any dark hour)	A	B	C	D	E	6.0	1.0	5.0	_____
							Operational Factors		==========
Environmental Factors									
% Development	none	1 quad	2 quad	3 quad	4 quad	2.0	0.5	1.5	_____
Set-Back Distance	> 200'	150 - 200'	100 - 150'	50 - 100'	< 50'	0.5	0.3	0.2	_____
Cross-Road Approach Lighting	none		partial		complete	3.0	2.0	1.0	_____
Freeway Lighting	none		interchanges only		continuous*	5.0	3.0	2.0	_____
							Environmental Factors		==========
Accidents									
Rate of Night-to-Day Accident Rates	< 1.0	1.0 - 1.2	1.2 - 1.5	1.5 - 2.0	> 2.0*	10.0	2.0	8.0	_____
							Accident Factors		==========

*Complete lighting warranted.

GEOMETRIC TOTAL = _____

OPERATIONAL TOTAL = _____

ENVIRONMENTAL TOTAL = _____

ACCIDENT TOTAL = _____

SUM = _____ POINTS

COMPLETE LIGHTING WARRANTING CONDITION = 90 points

PARTIAL LIGHTING WARRANTING CONDITION = 60 points

REF: ROADWAY LIGHTING HANDBOOK, U.S. DOT, DECEMBER 1978.

APPENDIX H

MINUTES OF TAC/PUBLIC MEETINGS

MINUTES TO 5/14/92 TRANSPORTATION ADVISORY COMMITTEE MEETING

LINCOLN CITY TRANSPORTATION MASTER PLAN

This was the first meeting of the Transportation Advisory Committee for the Lincoln City Transportation Master Plan. The meeting was held in the conference room of the Visitor Information Center at Lincoln Square. In attendance were the following individuals:

Alan Danaher - Project Manager, David Evans and Associates
Bruce Henderson - Client Manager, David Evans and Associates
John McKevitt - Director of Public Works, City of Lincoln City
Richard Ullian - Planning Director, City of Lincoln City
Mike Holden - Lincoln City Police Department
Mary Kacy - Lincoln City Economic Development Commission
Dan Dolan - Lincoln City Planning Commission
Lori Ann Sheridan - Executive Director, Lincoln City Chamber of Commerce
George Kirkham - Lincoln City Traffic Safety Commission
Matt Spangler - Planning Director, Lincoln County
Joe Dellavallo
Margaret Kerr
Marsha Sandman
James DePorter
Henry Wolf

The meeting started with introductions. Then John McKevitt, the City's Project Manager for the study, discussed the purpose of the transportation master plan study and the City's involvement. David Evans and Associates (DEA) has been retained to develop this master plan as well as plans for the drainage and wastewater systems in the city.

Bruce Henderson from DEA discussed the study organization and DEA's past experience with transportation master plan studies. Then Alan Danaher with DEA reviewed the scope of work and schedule. The study is scheduled to be completed within nine months, by the end of the year. The master plan will be prepared to conform with the requirements in the new State Transportation Planning Rule, and will include the development of different plans for highway, transit, pedestrian, and bicycle modes, as well as address off-street public parking development, street lighting development, and the identification of transportation funding sources.

An integral component of the study will be public involvement, including input from the Transportation Advisory Committee. Four TAC meetings are planned during the study. Besides this introductory meeting, TAC meetings will be held at the end of the inventory and transportation safety analysis stage; at the end of the roadway system alternatives analysis and the transit, bicycle/pedestrian, parking, and street

lighting analyses; and after the preliminary transportation master plan has been prepared. The TAC meetings will be supplemented by two "town hall" public meetings, the first on June 4 to review the scope of work and preliminary plan goals and objectives, and to secure input on transportation issues of concern to the committee. The second town hall meeting will be held at the end of the study to review the preliminary transportation master plan.

Following the review of the scope of work, Alan Danaher presented some preliminary plan goals and objectives. The goals and objectives were prepared for nine different categories:

1. Roadway development
2. Pedestrian facilities
3. Bicycle facilities
4. Street lighting
5. Public transit
6. Travel demand reduction
7. Off-street parking development
8. Transportation financing
9. Public involvement

There were several questions from committee members on the intent of the U.S. 101 bypass analysis. Alan Danaher explained that the need for and timing of a possible bypass would be assessed using the traffic model to be developed as part of the study. At this time, the bypass is seen as a long-term improvement. Alan mentioned that the Oregon State Highway Division (ODOT) had conducted a reconnaissance-level study of the bypass, evaluating several alignment alternatives. In addition to the extensive cost (a 7.5-9 mile bypass would be required), there are substantial land use and environmental issues which will warrant analysis before a final decision on a bypass can be made.

As the last item on the agenda, the committee was asked to identify any issues or concerns which should be addressed in the study. The following issues were raised:

- Mike Holden indicated that it might be appropriate to obtain some traffic counts on the Memorial Day weekend;

- George Kirkham, James DePorter and others were concerned about the master plan study's interface with ODOT's planning efforts, particularly related to further parkway development in Lincoln City (Alan Danaher indicated that the master plan is preceding ODOT's Highway 101 Corridor

Study, with the intent to provide detailed information and recommendations to ODOT on required road improvements in the city which will have some degree of community consensus); Mary Kacy felt that ODOT will cooperate in identifying mutually-acceptable solutions to Highway 101 improvements;

- George Kirkham also raised the issue that the revised road functional classification plan to be developed as part of the study should include strategies to reduce through traffic on local streets;

- James DePorter raised the issue of possible reversible-lane operation on Highway 101 through the city (Alan Danaher indicated that this would require overhead lane control signals, and there could be traffic conflicts associated with the period where traffic flow is changed in the reversible lane;

- George Kirkham stressed the need to address intercity travel as one component of a possible public transit service, and indicated that plans to implement such a service between Lincoln City and Newport (by Valley Retriever) are about completed.

- George Kirkham indicated that parking requirements for recreational vehicles should be considered in the off-street parking development analysis; also the feasibility of developing a pedestrian crossing of Highway 101 under the "D" River bridge should be evaluated;

After the issues discussion, Alan Danaher closed the meeting by asking the committee's preference on future meeting times. The committee felt Thursday evenings would be OK. The next TAC meeting is scheduled for Thursday, July 30, at 7:00 PM in the Conference Room of the Lincoln City Visitor Information Center at Lincoln Square. Alan Danaher encouraged the committee members to attend the upcoming town hall meeting on June 4, and solicited there participation in serving as small-group workshop facilitators at this meeting.

Lori Ann Sheridan will proceed to provide data on visitor lodging utilization for use in calibrating the traffic forecasting model. George Kirkham will provide data on the route structure and ridership associated with the Antique Week shuttle service last fall, as well as a copy of the street improvement recommendations identified by the City Traffic Safety Commission.

MINUTES TO JUNE 4, 1992 "TOWN HALL" MEETING

LINCOLN CITY TRANSPORTATION MASTER PLAN

On Thursday, June 4, 1992, at Lincoln Square in Lincoln City, the first town hall meeting on the Lincoln City Transportation Master Plan study was held. About 25 people attended the meeting, including most of the members of the Transportation Advisory Committee for the study (meeting attendance roster is attached).

The meeting started with an introduction by John McKevitt, Public Works Director for Lincoln City. John explained that the City has hired David Evans and Associates, Inc. (DEA) to develop a transportation master plan for the City, in conformance to the new State Transportation Planning Rule prepared by the Oregon Department of Land Conservation and Development. Alan Danaher, the study Project Manager, then proceeded with a discussion of the study work program, schedule, and preliminary plan goals and objectives. Alan indicated that the intent of the meeting was to break up into small group sessions to obtain public input on transportation issues, concerns, alternatives, and improvements which should be addressed in the master plan study. The following items were identified in the discussion:

1. Getting through the City is difficult.

2. Should avoid breaking-up neighborhoods with road improvements.

3. Bypass around the east side of Highway 101 is needed.

4. Utilize undeveloped land in developing road improvements.

5. Develop commercial "belt line" route on east side of City.

6. Develop floating bridge across west end of Devils Lake, as part of belt line proposal.

7. Belt Line should have limited access, and could use a portion of Pacific Power/Northwest Gas line alignment.

8. Need actual summer traffic counts.

9. Concerns over financing - needs to be realistic plan.

10. Concern that ODOT will dictate improvements to Highway 101 to city.

11. Shouldn't increase neighborhood traffic congestion by diverting traffic off U.S. 101.

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[illegible]
[illegible] AVENUE
[illegible], OREGON 97201-4880
[illegible] FAX (503) 223-2701

12. Desirable to have clustering of businesses off Highway 101 at major side streets.

13. No raised median on Highway 101.

14. Remove on-street parking on Highway 101 - add off-street parking.

15. Public transportation needed.

16. Light rail along Highway 101 should be considered.

17. City should control street lighting - possibility of solar?

18. Pedestrian/bicycle trails along beachfront desirable.

19. People plazas at several locations along Highway 101 would be an asset.

20. Need to facilitate public transit - vans, carpools.

21. Traffic bottlenecks along Highway 101 should be eliminated.

22. Off-street parking must be in place before highway parking is removed.

23. Local and ODOT transportation plans for Lincoln City should complement each other.

24. No parkway (raised median) should be developed along Highway 101.

25. Need fifth lane (center left turn lane) on Highway 101.

26. Traffic signal at Highway 101 and North 17th Street needed (possible pedestrian overpass at this location).

27. Jetty Avenue should be used as an alternate to Highway 101.

28. Harbor Avenue/North 15th Street intersection needs to be studied - existing sight distance problem.

29. Remove parking on Highway 101 between North 15th Street and North 21st Street.

30. Designate pedestrian pathways.

31. Balance among parking, bicycles, and pedestrians.

32. Dollars will be needed for right-of-way acquisition for road improvements.

33. Sight distance problem at Oar Avenue/North 21st Street intersection.

34. Improve east-west streets for local traffic.

35. Minor side street access onto Highway 101 should be right-turn only.

36. Traffic signal needed at Highway 101/North 12th Street intersection.

37. Traffic signal needed at Holmes/Highway 101 intersection (ODOT will probably not approve).

38. Turn lane at South 14th Street/Highway 101 intersection needed.

At the end of the meeting, Alan Danaher indicated that the next Transportation Advisory Committee meeting will be held on Thursday, July 30, at 7:00 PM at Lincoln Square. The intent of this meeting will be to review the results of the transportation facility inventory, traffic safety analysis, and "no-build" deficiencies analysis from the traffic forecasting model to be developed as part of the study. The general public will be invited to attend this meeting.

MINUTES TO 7/30/92 TRANSPORTATION ADVISORY COMMITTEE MEETING LINCOLN CITY TRANSPORTATION MASTER PLAN

This was the second Transportation Advisory Committee meeting for the Lincoln City Transportation Master Plan. The meeting was held on the 2nd floor of the Lincoln Square building, and convened at 7:00 PM on July 30, 1992. In attendance were the following individuals:

Alan Danaher - David Evans and Associates (Consultant Project Manager) - 223-6663
John McKevitt - Lincoln City Director of Public Works (and TAC member) - 996-2154
Dan Dolan - Lincoln City Planning Commission (and TAC member) - 994-8467
Henry Wolf - TAC member - 994-2245
George Kirkham - Lincoln City Transportation Committee (and TAC member) - 996-6940
Margaret Kerr - TAC member - 994-8465
Mary Kacy - Lincoln City Economic Development Council - 994-5342
Mike Holden - Lincoln City Police Department (and TAC member) - 994-3636
John Detar - ODOT Region 2 Transportation Planner (and TAC member) - 378-2626
Tom Bennett - Lincoln City *News Guard* - 994-2178
Dave Humphrey - KBCH/KCRF radio - 994-2181
Linda Lanham - Newport *News-Times* - 994-2664
Joe Dellavalle - KYTE radio (and TAC member) - 994-2290
Lori Ann Sheridan - Lincoln City Chamber of Commerce (and TAC member) - 994-3070
Dave Sheridan - C.O.C. Economic Development - 994-6012
Smokey Aschenbrenner - Lincoln City City Council - 994-2141
Jack Byron - Citizen - 994-3277
Tom Owczazak - Lincoln City Citizens for a Bypass - 994-4848
John LoBello - Citizen - 994-3003
Karen Vanderzanden - Lincoln City Parks Board - 994-7953
Dorothy Rintoul - TAC member - 994-6456

Alan Danaher with DEA went through the agenda (attached) item-by-item, including a detailed handout documenting the study progress to date. The following discussion occurred during Mr. Danaher's presentation:

1. Input Received at 6/4 Public Meeting

Alan Danaher reviewed the minutes of the June 4 public meeting on the study. Two major public comments surfaced from that meeting: 1.) no raised median on Highway 101 through the City and 2.) a bypass should be developed as soon as possible. Tom Owczazak stressed that there was no support for raised median development in the City.

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2. Refined Transportation Plan Goals and Objectives

Alan Danaher presented the refined goals and objectives for the transportation plan development. These remained virtually the same as the draft goals and objectives. Alan indicated that a newspaper article on the transportation plan issued after the June 4 meeting did not identify any further public comments on the planning effort.

John Detar indicated that some mention should be made in the goals and objectives that the transportation plan will be prepared in conformance with the new State Transportation Planning Rule.

3. Review of Past Plans and Policies

Alan Danaher reviewed the contents of a technical memorandum summarizing a review of past transportation studies in Lincoln City applicable to the current planning study. The last comprehensive assessment of transportation conditions in Lincoln City was conducted as part of the 1981 Lincoln City Transportation Safety Study. That study identified a set of short-term improvements to the street system in the City. Further assessment of improvement needs along Highway 101 was conducted in developing the Year 2000 City Urban Renewal Plan, which promoted, for the first time, the concept of raised median development on Highway 101.

4. Results of Street Inventory

Alan Danaher reviewed various maps prepared summarizing the street inventory conducted as part of the planning study. Maps reviewed included:

- Street functional classification plan prepared by City Transportation Committee, location of traffic signals, and roads under State and Lincoln County jurisdiction;
- 1992 summer (Memorial Day) and winter daily traffic counts;
- Existing sidewalk and bike route locations;
- Existing unlit street locations; and
- Peak hour roadway capacity.

Memorial Day daily traffic counts were obtained in response to a concern expressed at the 1st TAC meeting that spring break traffic conditions might not reflect the summer peak period, and the impact of the opening of the Oregon Coast Aquarium. The traffic model will be developed for the Memorial Day condition. John Detar suggested that a daily traffic volume for Logan road north of Highway 101 be presented. George Kirkham indicated that there was an error in the sidewalk graphic, with no sidewalk on Highway 101 between Holmes road and N. 32nd

Street. Karen Vanderzanden stressed the need to identify the percentage of recreational vehicle and truck traffic in the City, and to present some information on the volume of these vehicles today and in the future.

Revised traffic volume, sidewalk, and peak hour capacity graphics have been prepared and are attached to these meeting minutes.

5. Preliminary Traffic Safety Analysis

Alan Danaher summarized the results of an intersection level of service and accident analysis on Highway 101 through Lincoln City. DEA is working with the Lincoln City Police Department to secure a breakdown of 1988 accident data to package with 1989-90 accident statistics, and will also receive some accident reports to further assess the type of accidents at specific intersections.

Alan also presented a preliminary list of recommended short-term traffic safety and capacity improvements in Lincoln City, for the same improvement categories developed for the 1981 Lincoln City Transportation Safety Study. Improvement recommendations included the following:

1. New signals and modifications to existing signals;
2. On-street parking removal (to improve intersection sight distance);
3. Intersection driveway/channelization modifications;
4. Beach access improvements, including improved signing off Highway 101 and added parking;
5. Pedestrian crosswalk consolidation and advance signing improvements, and added vehicle stop bars at intersections;
6. Pavement marking additions, modify incorrect markings, and redo existing faded markings;
7. Signing modifications; and
8. Roadway capacity improvements (in particular, widening Highway 101 to five lanes through Lincoln City).

Alan Danaher will review the improvement recommendations in further detail with the Lincoln City Transportation Committee. Alan will also review signal modification possibilities with the ODOT Region 2 Traffic Operations Engineer. Comments on the preliminary improvements expressed at the meeting included the following:

- Elimination of pedestrian crosswalks along Highway 101 was not desirable;

- Mike Holden indicated that ODOT will not accept placing flashing beacons on advance pedestrian crossing signing (Alan Danaher will review this with ODOT);

- Added parking at beach access locations other than at "D" River and Siletz Bay Waysides might not be appropriate (should cater to local pedestrian/bicycle traffic) (George Kirkham felt more parking was preferable). Beach access improvements should address handicapped access requirements to beach.

6. Population/Employment Projections and Traffic Model Development

Alan Danaher reviewed a memorandum prepared by DEA on how the population and employment projections for Lincoln City for use in the traffic forecasting model were developed. The projections are for the year 2015, to be consistent with the planning horizon in ODOT's Highway 101 Corridor Study. The projections call for an increase in the base population in the City to about 10,500 persons by year 2015, with an anticipated peak seasonal population of about 26,000 persons in 2015.

7. Year 2015 No-Build Conditions

At the meeting, Alan Danaher indicated that DEA was still in the process of calibrating the traffic forecasting model, and would prepare a summary of the year 2015 no-build analysis for distribution to the committee in August.

8. Preliminary Roadway System Alternatives

Alan Danaher reviewed the preliminary roadway system alternatives which DEA would like to evaluate with the traffic forecasting model. The improvement alternatives include the following:

1. Bypass on east side of Devils Lake (following alignment recommended by ODOT in 1974 reconnaissance study);

2. Truck route or parkway on west side of Devils Lake (following alignment identified by one of the small group sessions at the first public meeting on the transportation plan);

3. Improved oceanfront north-south collector, including different connections options at north and south ends; and

4. Local street extensions, including extension of Spyglass Drive south of High School Drive, S. 48th Place east to Schooner Creek Road, and S. Coast Avenue south of Bard Road.

John Detar indicated that ODOT might not be able to participate in the construction of a truck-only route on the west side of Devils Lake, and that a parkway designation for this alignment (with limited access) would be more appropriate. John also questioned whether this alignment could be developed without encroaching on Devils Lake State Park.

Mary Kacy suggested that an alternative be evaluated which would extend Highway 18 around the east side of the City, such that Access Oregon funding could be used for the construction of the bypass. There are issues related to how Highway 101 would tie into such an alignment (would Highway 101 through the city remain?).

9. Study Schedule

Alan Danaher presented a revised schedule for the transportation master plan study. In August, DEA will proceed with the roadway system alternatives analysis and with the four specialty analyses (public transit feasibility, off-street parking development, pedestrian/bicycle circulation, and street lighting). In late August and September, the preliminary transportation plan will be prepared. The next TAC meeting will probably be held at the end of September or early October.

MEMORANDUM

To: John McKevitt, City of Lincoln City

From: Alan Danaher, DEA

Date: September 28, 1992

RE: MINUTES TO MEETING WITH ODOT REGION 2 ON SHORT-TERM TRAFFIC SAFETY IMPROVEMENTS - LINCOLN CITY TRANSPORTATION MASTER PLAN (LINC0002)

For the record, I thought it would be appropriate to develop minutes to our meeting with ODOT Region 2 on September 8. the intent of the meeting was to receive ODOT's insights on the recommended short-term traffic safety improvements in Lincoln City initially presented at the July 30 Transportation Advisory Committee meeting and at the August 13 City Traffic Safety Committee meeting. In attendance at the meeting were the following individuals:

Alan Danaher - DEA
John McKevitt - Lincoln City Dept. of Public Works
John Detar - ODOT Region 2 Transportation Planner
Will Bradshaw - ODOT Region 2 Traffic Operations Engineer
Ron Hilton - ODOT Region 2 District Maintenace Supervisor

The following input was received:

SIGNAL IMPROVEMENTS

Will Bradshaw indicated that there is a signal interconnection system on Highway 101 already operating, from S.E. East Devils Lake Road to North 22nd Street, with the signal at East Devils Lake Road having the master controller. Will indicated there are problems with the signal timing (both hardware problems and signal spacing problems), and upgrading of the system is required.

The identified required hardware modifications at the signal locations were all acknowledged, with priorities at the North 6th Drive and North 21st/22nd Street intersections. ODOT would like to see the North 21st Street signal removed. ODOT would also like to see the North 48th and 51st Streets consolidated into a single signal installation if possible.

PEDESTRIAN CROSSWALK SIGNING IMPROVEMENTS/CONSOLIDATION

ODOT is supportive of crosswalk consolidation along Highway 101, to the extent that there is community support. The identified pedestrian crosswalk consolidation plan was considered a good starting point. There was concern for the development of overhead pedestrian crossing warning signing at every designated crosswalk. Provision of overhead pedestrian crossing warning signing at the start of a series of pedestrian crosswalks would be more appropriate, with supplemental side-of-road warning signing before each crosswalk.

PARKING RESTIRCTIONS AT INTERSECTIONS WITH SIGHT DISTANCE LIMITATIONS

ODOT concurred with the identified intersection locations on Highway 101 where parking should be removed to improve sight distance for side street traffic.

ACCESS CONTROL MODIFICATIONS

ODOT concurred with all of the identified access consolidation modifications proposed, noting that the S.W. 32th to S.W. 35th Street frontage road extension in the Nelscott District is programmed for improvement. ODOT is also looking for some realignment at the North East Devils Lake Road intersection to improve sight distance. John McKevitt indicated the need to coordinate this work with a City sewer project at the intersection.

BEACH ACCESS SIGNING

The concept of providing improved beach guide signing along Highway 101 at those streets serving designated beach access locations was acceptable to ODOT, as long as there were plans for providing adequate parking at these locations. Top riority should be given to adding beach guide signing at the Highway 101/South 51st Street intersection.

cc: John Detar, ODOT Region 2
Will Bradshaw, ODOT Region 2
Ken Hilton, ODOT Region 2

MINUTES TO 10/6/92 TRANSPORTATION ADVISORY COMMITTEE MEETING

Lincoln City Transportation Master Plan

On Tuesday, October 6, 1992, at 7:00 PM at Lincoln Square, the third meeting of the Transportation Advisory Committee (TAC) for the Lincoln City Transportation Master Plan study was held. Twenty (20) persons attended the meeting. Those in attendance included:

- Alan Danaher - David Evans and Associates - 223-6663
- John McKevitt - Lincoln City Public Works Department - 996-2154
- Mike Holden - Lincoln City Police Department - 994-3636
- Joe Dellavalle - KYTE radio - 994-2290
- Smokey Aschenbrenner - Lincoln City City Council - 994-2141
- Pam Geddes - Lincoln City *Newsguard* - 994-9476
- Jim DePorter - Lincoln City TAC - 994-8655
- Dale Fugua - Lincoln Cab Company - 392-4670
- Jim Neare - Lincoln Cab Company - 996-2003
- Kent Sewell - Coast Tour and Charter - 996-6001
- John DeTar - ODOT Region 2 - 378-2626
- Sam Cribbs - Lincoln City Mayor - 994-9983
- Rae Cribbs - Chair, Lincoln City Urban Renewal Advisory Board - 994-9983
- Mary Kacy - Lincoln City TAC - 994-5342
- Henry Wolf - Lincoln City TAC - 994-2245
- George Kirkham - Lincoln City TAC and Traffic Safety Committee - 996-6940
- Dan Dolan - Lincoln City TAC and Planning Commission - 994-8467
- Heather Tiedhea - 994-5716
- David Humphrey - KBCH/KCRF - 994-2181
- Linda Lanham - Newport *News Times* - 1-800-551-4260

The meeting focused on a discussion by Alan Danaher, Project Manager for the Transportation Master Plan study, of the results of the different transportation analyses which had been conducted since the last TAC meeting in July, and the preliminary transportation master plan. Prior to the meeting, various traffic flow and plan maps and reports documenting the public transit feasibility and street lighting analyses were mailed to the TAC for their review. At the meeting, the TAC received the reports documenting the off-street parking and bicycle/pedestrian circulation analyses.

The following items were discussed at this meeting:

ROADWAY SYSTEM ALTERNATIVES

Mr. Danaher presented the results of the roadway system alternatives analysis, which evaluated different options of improving existing Highway 101 versus a bypass on the east or west side of Devils Lake. DEA modeled these three options, as well as a fourth option which evaluated the impact of widening Highway 101 plus constructing an east side bypass. The two bypass alignment options were modeled as two-lane roadways. Traffic flow maps identifying the year 2015 summer weekday PM peak hour volumes for each alternative were reviewed, as well as an intersection level of service comparison and summary evaluation matrix of the different alternatives. Mr. Danaher pointed out that along Highway 101, the level of service is dictated by the intersection operations, and not the street segment volume to capacity ratio.

Even if Highway 101 is improved to a continuous 4-5 lane section through Lincoln City in the future, there will still be a need for a supplemental two-lane bypass facility in the long-term (post year 2015). If the bypass could be developed in the short-term, it is conceivable that a complete widening of existing Highway 101 to 4-5 lanes in the long-term might not be required, although a bypass project realistically can not be developed in the short-term. An east side bypass could require several exceptions to the state planning rule, with respect to Goal 4 (Forest Land), Goal 11 (Public Facilities and Services) and Goal 14 (Urbanization). Most of this alignment would be outside the urban growth boundary. The alignment could also traverse a bald eagle habitat area. The west side parkway could be a more expensive option, with the extensive bridge treatments over the north and west arms of Devils Lake. The parkway alignment could also encroach on Devils Lake State Park (thus impacting Goal 5 - Open Spaces, Scenic and Historic Areas, and Natural Resources), with a portion of the corridor at the south end also being outside the urban growth boundary.

There was extensive discussion on which alternative appeared to be preferable at this time, and if any alignment option should be eliminated from further consideration in the transportation master plan. There was a general consensus that the west side parkway should be eliminated from further consideration, due to its impact on Devils Lake and on property on the west side of the lake. The east side bypass should be shown on the transportation master plan as a future facility, with a general corridor identified. Further review of specific alignment alternatives for a bypass would have to be considered in a detailed environmental/preliminary design study. ODOT's ongoing Highway 101 Corridor Study will not be able to look at the alignment alternatives in any great detail. There was no decision on whether to show further widening of existing Highway 101 on the plan (subject to further discussion with the City, TAC, and ODOT).

PUBLIC TRANSIT FEASIBILITY ANALYSIS

Mr. Danaher summarized the findings of the public transit feasibility analysis. The analysis was intended to provide an overview of the potential for fixed-route public transit service in Lincoln City, with possible routes, service levels, ridership, and capital and operating costs identified.

A more specific Transit Development Program study would need to be undertaken to provide further analysis before the City could make a final determination on whether fixed route service should be instituted in the City. A TDP study would also detail improvements to the existing demand-responsive transit services in the City. There could be funds available through the ODOT Mass Transit Division to conduct such a study. Mr. Danaher will check on this and report back to the TAC at its next meeting.

DRAFT TRANSPORTATION MASTER PLAN

The different preliminary transportation plan maps were reviewed. The revised street functional classification plan includes major and minor arterial, and collector classifications. The east-west collector street system intersects Highway 101 at locations where there are currently or could be traffic signals in the future. A preliminary set of typical street sections for these classifications were also reviewed. These typical sections are intended to be applied to new and improved streets. Mr. Detar indicated that the State Transportation Planning Rule requires that all arterials and major collectors have designated bike facilities. Thus it could be important to distinguish between major and minor collectors in the street functional classification plan.

The preliminary bicycle circulation plan focuses on modifying the bike route system initially proposed in the 1987 City Bicycle Master Plan to the revised street classification system. The preliminary pedestrian facilities plan identifies those streets which should have priority in sidewalk development, along with a pedestrian crosswalk plan along Highway 101.

The preliminary off-street parking plan shows the location and potential size of added off-street public parking facilities in the City, most of which would be located in the Delake and Taft commercial districts. It was pointed out that the proposed lot at N. 21st Street and Jetty Avenue had already been sold for development, and that the site on the east side of Highway 101 north of the "D" River might be a part of the Devils Lake State Park property.

TRANSPORTATION FINANCING ANALYSIS/CAPITAL IMPROVEMENT PROGRAM

The transportation financing analysis component of the master plan study is still underway, with the results to be documented in a report to be prepared by early November. This report, along with a draft capital improvement program, will be mailed to the TAC for review before the next TAC meeting.

STUDY SCHEDULE

The schedule currently calls for the completion of a draft transportation plan document by the end of November, with a follow up review meeting with the TAC after the draft is completed. A tentative date of December 1 for the fourth and final TAC meeting has been identified. The second town hall meeting will be held after the next TAC meeting, probably December 15. The draft transportation plan document will be sent to the TAC for review at least a week prior to the TAC meeting.

MINUTES TO 1/7/93 TRANSPORTATION ADVISORY COMMITTEE MEETING LINCOLN CITY TRANSPORTATION MASTER PLAN

On Thursday, January 7, 1993, at 7:00 PM at the Lincoln City Community Center, the fourth meeting of the Transportation Advisory Committee (TAC) for the Lincoln City Transportation Master Plan study was held. Twenty (20) persons attended the meeting. Those in attendance included:

Alan Danaher - David Evans and Associates - 223-6663
Lori Ann Sheridan - Lincoln City Chamber of Commerce - 994-3070
Mike Holden - Lincoln City Police Department - 994-3636
Huk McCann - Rollerbladers - 994-9733
Mary Kacy - Lincoln City TAC member - 994-5342
Jim DePorter - Lincoln City TAC member - 994-8655
George Markham - Lincoln City Traffic Safety Committee and TAC member - 996-6940
Dan Dolan - Lincoln City Planning Commission - 994-8467
Henry Wolf - Lincoln City TAC member - 994-2245
Margaret Kerr - Lincoln City Traffic Safety Committee and TAC member - 994-8465
Dorothy Rintoul - Lincoln County Council on Aging - 994-6456
Hazel Guptil - President, Lincoln County Council on Aging - 996-6860
Thelma Roose - 996-4821
John Mckevitt - Lincoln City Public Works Department - 996-2154
Jack Barnes - City of Lincoln City - 994-3277
John deTar - ODOT Region 2 - 378-2626
Richard Ullian - Lincoln City Planning Department - 996-2153
Joan Chambers - Lincoln City City Attorney - 996-2159
Weston Hesinger - 994-9266
Paco Maribona - 994-3844
Joe Dellavalle - 994-2290
Representative from Newport *News Times* - 1-800-551-4260

1. ACCESS MANAGEMENT CONCEPT PLAN

The meeting focused on a discussion of the results of the Highway 101 access management analysis conducted by David Evans and Associates (DEA), the consultant working with the City of Lincoln City in developing the Lincoln City Transportation Master Plan. In December, a draft report summarizing this analysis was sent to the TAC members for their review. Alan Danaher with DEA started the meeting by reviewing the results of the analysis. The analysis was conducted in response to ODOT's new access management policy for the state highway system, as well as the realization that some level of improvements to existing Highway 101 through the city will be required, given that an east side bypass is probably a long-term project due to funding limitations and the extent of planning, environmental documentation, and right-of-way acquisition involved.

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Alan presented a draft access management concept plan for Highway 101 through the city. This plan includes a set of Highway 101 access management policies, as well as a set of facility modifications. The plan reflects ODOT's Access Management Policy, and the anticipated access management category classifications for Highway 101 through the city. The facility modifications include:

1. Designated arterial/collector intersections;
2. Signal locations;
3. On-street parking removal;
4. Center left turn lane development;
5. Restricted access at local street intersections;
6. Local driveway consolidation and restricted access;
7. Frontage road development;
8. Pedestrian crosswalk removal;
9. Sidewalk development; and
10. Guide sign development.

A lively discussion ensued at the meeting on the need for and form of access management along existing Highway 101. A summary of the comments expressed are as follows:

- Mary Kacy felt that the most appropriate strategy was to focus on improving Highway 101 at critical locations (intersection improvements and widening where possible), while at the same time pursuing implementation of an east side bypass project.

- There was some expression of the need for a pedestrian-actuated signal at North 17th Street on Highway 101, associated with the new off-street parking lot serving the Oceanlake District.

- As expressed at previous meetings, there was general support by TAC members for center left turn lane development along Highway 101, with little support for a raised median.

- One individual living on South 39th Street indicated the undesirability of restricting access to that street off Highway 101 to right-in, right-out only.

- Restricted access (right-in, right-out) should be to South 29th Street, not South 30th Street (as 30th does not intersect with Highway 101);

- On-street parking removal should only occur if adequate off-street replacement parking exists.

- John deTar clarified that ODOT's level of service standard (according to the 1991 Highway Plan) for smaller urban communities such as Lincoln City is "C", not "D" as identified in DEA's report.

Subsequent to the meeting, Richard Ullian suggested that the following changes be made to the access management concept plan:

- The City has plans to realign South 32nd Street to create a four-leg intersection with Highway 101, which will promote signalization of this intersection in the future;

- The City and ODOT have met with the Nelscott business community and there has been discussion of restricting access off South 35th Street to right-in, right-out only;

- The City would like to see the signal at South 48th Place eventually moved to South Galley Place, with an extension of Galley Place east of Highway 101 to connect with High School Drive; and

- South 35th Street should be considered as another candidate for right-in, right-out only access.

2. SCHEDULE

DEA is continuing to develop the draft transportation plan document, and should have a draft available for TAC review in late February. The draft report will first be reviewed by City staff. The date for the next TAC meeting will be scheduled once the draft plan document is available for TAC review, probably not until the end of February or early March. The final plan will be presented to the City Planning Commission and City Council for approval in late March or April.

APPENDIX "X"

ODOT'S ACCESS MANAGEMENT POLICIES AND STANDARDS

(This is an informational resource only.)

"The Oregon Transportation Plan (OTP) must be implemented through integrated state, regional and local planning and the private sector if it is to guide Oregon's transportation future effectively. The OTP leads this process by identifying in general terms the statewide transportation system and the minimum levels of service which should be achieved. Further planning activities will provide the details of the transportation system to be developed over time in accordance with the OTP and other laws, regulations and policies.

The elements of integrated transportation planning and system management statewide will include:

- Modal and multimodal plans developed by ODOT and other state agencies;
- System management developed by ODOT and other state agencies;
- Metropolitan area plans developed through Metropolitan Planning Organization (MPO) planning processes in conformity with state and federal laws, plans, policies, and rules;
- Plans developed by local governments and special districts."[2]

"County and city transportation planning shall be consistent with the OTP, the LCDC Transportation Planning Rule, the State Implementation Plan under the Clean Air Act Amendments and the regional transportation system plan."[3]

The study includes identification of required facility improvements and access and land use management strategies along Highway 101. This study is being coordinated with the City transportation master plan development. This coordination includes incorporating the transportation data base, short-term needs assessment, roadway system alternatives analysis, and the different transportation plan components developed in the city transportation master plan into the overall corridor evaluation.

[2] *OTP*, p. 111.

[3] *OTP*, p. 116.

Chapt 6

HIGHWAY 101 ACCESS MANAGEMENT ANALYSIS

NEED FOR ACCESS MANAGEMENT

ODOT Policies and Standards

In conjunction with improving existing Highway 101 through Lincoln City, in particular increasing its capacity to handle traffic in the future, there will be a need to develop and implement an access management strategy for this roadway. Preservation of traffic operations in the existing Highway 101 corridor is critical especially in the future given the long-term transportation needs in the corridor. ODOT's 1991 Highway Plan, in its "Level of Importance" Policy, identifies Highway 101 as a highway of "statewide" significance, intended to provide connections and links to larger urban areas, ports and major recreation areas that are not directly served by interstate highways. In urban areas, the management objective for statewide highways is to provide for safe and efficient traffic operations with limited interruptions of flow. In urban areas such as Lincoln City, the operating level of service (LOS) standard for a statewide highway such as Highway 101 is C, but the minimum tolerable condition is LOS D.

ODOT has adopted an access management policy to identify criteria in the number, spacing, type and location of private driveways, local street intersections, and traffic signals to effectively manage roadway access in order to provide safe traffic operations, at a reasonable level of service, and in a cost-effective manner. The policy also provides a framework for making access decisions which will be consistent with the function and operating levels of service identified in the Level of Importance Policy. It will be used by ODOT to carry out its responsibilities for managing access under state statutes and administrative rules. It will also be used by ODOT to guide the design of highways and coordination with local comprehensive planning, particularly transportation and land use planning.

Access management categories are in the process of being assigned to every section of state highway in Oregon. For Highway 101 through Lincoln City, category 3 and 4 designations appear to be forthcoming. Category 3 would cover the sections of Highway 101 north of N.W. Logan Road, through the Nelscott area, and south of Schooner Creek Road, with category 4 covering the rest of the city. To date, only a limited number of access criteria have been developed for the different highway categories. For categories 3 and 4, the following criteria have been established (related to urban areas):

Category 3 (Limited Control - Expressway)

1. Public road intersections can be at-grade or interchanges.

2. Public road spacing should be a minimum of 1/2 to 1 mile.

3. Private driveway spacing should be a minimum of 800 feet, with right turn in and out only access provided.

4. Signals, in general, should be spaced no closer than every 1/2 to 1 mile.

5. Partial access control should be provided, partial control being characterized by a raised barrier. Partial median control will allow for some well-defined and channelized breaks in the physical median barrier, and can be allowed where no degradation in traffic operations would result.

Category 4 (Limited Control)

1. Public road intersections can be at-grade or interchanges.

2. Public road spacing should be a minimum of 1/4 mile.

3. Private driveway spacing should be a minimum of 500 feet, with full access (left and right turns) allowed where possible.

4. Signals, in general, should be spaced no closer than every 1/2 mile.

5. Either partial or no median control should be provided, partial control being characterized by a raised barrier. Use of a median barrier can be interspersed with segments of continuous left turn lane, or if traffic volumes are low, no median at all.

These standards will be applied to ODOT's access management, operation, design, and local planning coordination actions in accordance with the following:

1. The existing intersections, median openings, and traffic signal spacing in a highway segment are not required to meet the spacing standards of the assigned category at the time of assignment. However, such features shall be modified or removed to meet the access management standards as changes to property use or roadway design allow.

2. The access management standards represent minimum standards. More stringent access management will be retained where it already exists. For design reasons, the minimum spacings may have to greater than specified, such as to provide adequate vehicle storage or auxiliary lanes. Traffic signals may be spaced at intervals different from the standards to optimize capacity and safety.

3. ODOT, in cooperation with a local jurisdiction, may enact more stringent access management standards through the adoption of specific corridor access management plans.

4. Although the policy focuses on undeveloped and transitional areas along state highways, it is meant to also be applicable to "retrofitting" problem areas with better access management plans.

5. A permit may be issued for a single access to a property that cannot be accessed consistent with the highway access spacing standards and either has no reasonable access or cannot obtain reasonable access to other roads in the area.

6. Single ownership parcels with site frontage along the highway exceeding the minimum shall not automatically be permitted the total number of accesses, median openings or traffic signals possible under the standards. The level of site access from the state highway shall be the minimum necessary to provide reasonable access based on operational, safety, and functional classification considerations.

ALTERNATE ACCESS MANAGEMENT STRATEGIES

Possible Strategies

There are several access management techniques that can be applied to promote the safe and efficient movement of traffic. These measures include all traffic operations improvements which serve to minimize the frequency and severity of traffic conflicts at minor public street intersections and private driveways.

The 1982 Federal Highway Administration publication *Access Management for Streets and Highways* identifies four categories of access management strategies:

1. Limit the Number of Conflict Points - Techniques which reduce the frequency of conflicts or reduce the area of conflict at some or all local streets and driveways by limiting certain kinds of maneuvers.

2. Separate Conflict Areas - Techniques which reduce the number of access points or directly increase spacing between driveways or between driveways and intersections.

3. Reduce Deceleration Requirements - Techniques which reduce the severity of conflicts by increasing driveway turning speeds, by decreasing through speeds, or by increasing driver perception time.

4. Remove Turning Vehicles from Through Lanes - Techniques which reduce both the frequency and severity of conflicts by providing separate paths and storage areas for turning vehicles.

For these four categories, a total of 66 access management techniques were identified (see Appendix F). Techniques were then related to the operational and development characteristics along a roadway, based on the highway traffic volume, the number of travel lanes and degree of access control, and the level of driveway development or driveway traffic volume.

Some of the alternate strategies identified in Appendix F may be applicable to Highway 101 in Lincoln City. Those strategies requiring the use of a raised median would not be consistent with the City's goals for the management of the highway.

Retrofit Program vs. Program for New Development Areas

Highway 101 in Lincoln City passes through the older established commercial areas in the North Lincoln City, Oceanlake, Delake and Taft districts, as well as only partially developed areas between S. 14th Street and S. 32nd Street, and north of N.W. Logan Road. The techniques which should be applied to achieve access management in these two types

of areas differ to some extent. In the developed areas, certain local access modifications, such as driveway consolidation or restricted movements, will be dependent on property redevelopment. In undeveloped areas, there is an opportunity to develop an initial local access management plan which can be used by developers as a framework for developing site-specific development plans.

TABLE 9
STREET STANDARDS

Section	Classification	Pavement Width in Feet	Right-of-way Width in Feet	Design Capacity Vehicles per Day
A	Local Residential	28	50	200*-1,200
B	Minor Collector	36	60	1,200-3,000
C	Minor Collector w/ Bike Lanes	46	70	1,200-3,000
D	Major Collector w/ Bike Lanes	50	70	3,000-10,000
E	Minor Arterial (*3 to 5 lanes w/Bike Lanes*)	50-74	100	10,000-32,000
F	Major Arterial (*5 lanes w/Bike lanes*)	74	100	32,000 and greater

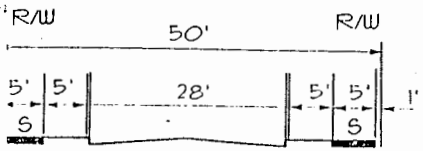
* 200 vehicles per day for cul-de-sac streets

Notes: 1) Design capacity based on level of service "D", 5 percent commercial vehicles, 10 percent right turns, 10 percent left turns, peak hour factor 90 - 95 percent, peak hour directional distribution 55 to 60 percent, peak hour 9-12 percent of daily volume and average signal timing for collector and arterial streets.

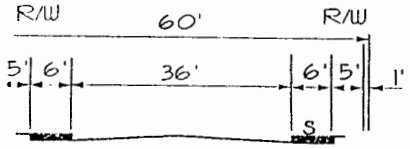
2) All new major collector and arterial roads shall include bike lanes.

GEND

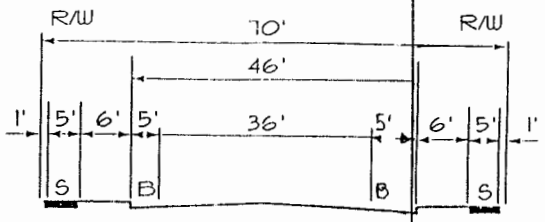
BIKELANE
SIDEWALK
) = RIGHT OF WAY LINE



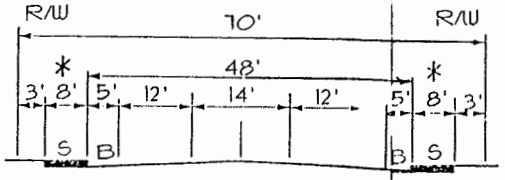
A - LOCAL RESIDENTIAL



B - COLLECTOR



C- COLLECTOR WITH BIKEWAYS

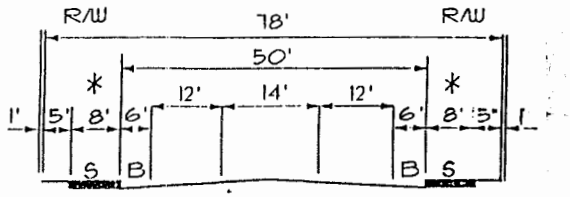


D- COLLECTOR WITH BIKE-WAYS
& CENTER LEFT TURN LANE

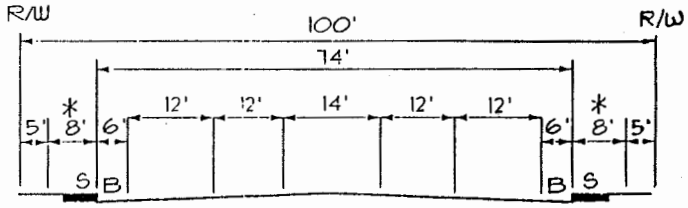
NOT TO SCALE

* IN COMMERCIAL AREAS, SIDEWALK IS 8 FEET WIDE ADJACENT TO CURB. ALL OTHER LOCATIONS, SIDEWALK IS 5 FEET WIDE LOCATED FIVE FEET FROM THE CURB FACE, AND FOR MAJOR ARTERIALS, THE SIDEWALK IS 6 FEET WIDE.

DEA
DAVID EVANS AND ASSOCIATES, INC.



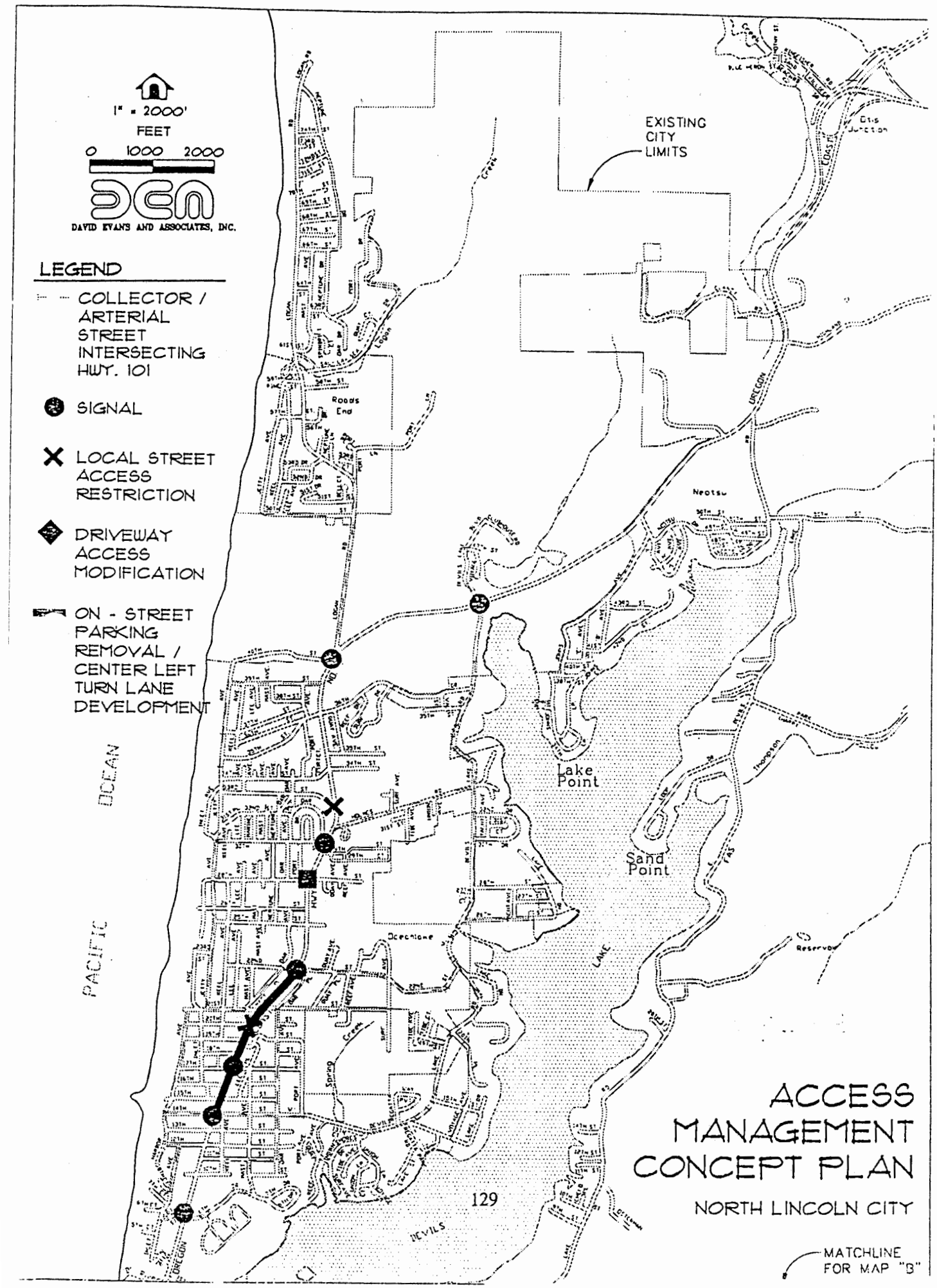
E - MINOR ARTERIAL WITH BIKEWAYS



F - MAJOR ARTERIAL WITH BIKEWAYS

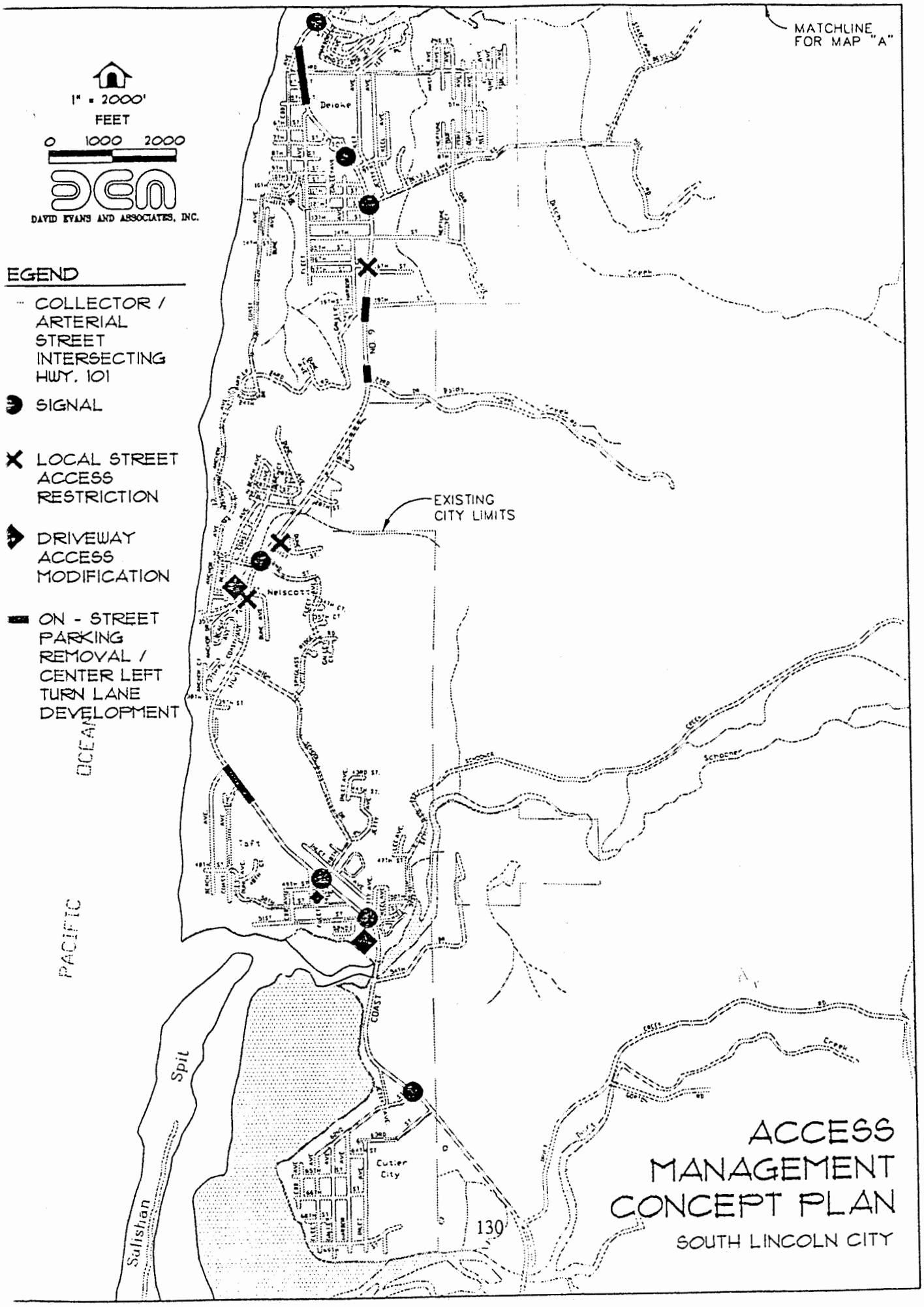
ODOT STREET DESIGN STANDARDS.

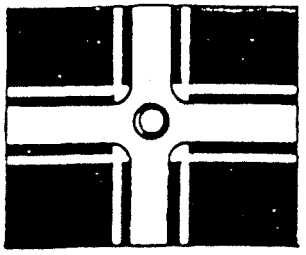
LINCOLN CITY



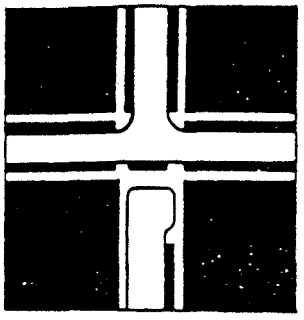
ACCESS MANAGEMENT CONCEPT PLAN

NORTH LINCOLN CITY

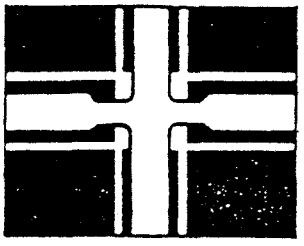

1" = 2000'
FEET
0 1000 2000
DAVID EVANS AND ASSOCIATES, INC.
EGEND
COLLECTOR / ARTERIAL STREET INTERSECTING HWY. 101
SIGNAL
LOCAL STREET ACCESS RESTRICTION
DRIVEWAY ACCESS MODIFICATION
ON - STREET PARKING REMOVAL / CENTER LEFT TURN LANE DEVELOPMENT
MATCHLINE FOR MAP "A"
EXISTING CITY LIMITS
OCEAN
PACIFIC
Spit
Salishan
Cutler City
Taft
Nelscott
Delake
Schooner
Creek
COAST
ACCESS MANAGEMENT CONCEPT PLAN
SOUTH LINCOLN CITY



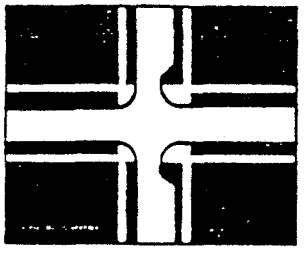
1. Traffic Circles are raised islands placed in the center of an intersection. The primary purpose of a traffic circle is to separate traffic within an intersection. This reduces the likelihood of a collision. Another important purpose of a traffic circle is to reduce speeding. Speeding is reduced most effectively when a series of traffic circles are constructed on a local street.



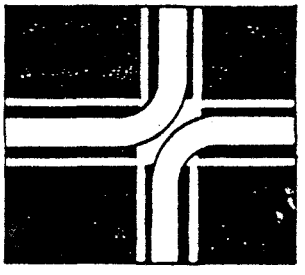
2. Cul-de-sacs are complete closures of the street, either midblock or at an intersection. They are intended to completely block access from one end of a local street. By doing so, major reductions in speeds and volume results. A cul-de-sac installed on a street may create problems for emergency vehicle access. This problem can usually be overcome if an adequate turnaround is provided, or the cul-de-sac is constructed with mountable curbs. Residents may be required to access their property by a less direct route if access is blocked by a cul-de-sac.



3. Chokers or curb extensions narrow the street by widening the sidewalk or the landscaped parking strip. These devices are employed to make pedestrian crossings easier and to narrow the roadway. They provide a visual cue to motorists that they are on a nonarterial route.



4. Semi-diverters limit access to a street from one direction by blocking half the street. Semi-diverters are generally effective in reducing volume, especially if one direction of travel predominates on a street. They allow a higher degree of emergency vehicle access than full diverters.



5. Diagonal diverters place a barrier diagonally across an intersection, disconnecting the legs of the intersection. These devices are effective in reducing volume. They allow more freedom of circulation within the neighborhood than cul-de-sacs. Diagonal diverters can be designed and installed to provide emergency vehicle access.

* Source: City of Portland Bureau of Traffic Management brochure, "Neighborhood Traffic Management Program

FIGURE 27
NEIGHBORHOOD TRAFFIC MANAGEMENT DEVICES
(GEOMETRIC FEATURES)

TABLE 11
CHARACTERISTICS OF NEIGHBORHOOD TRAFFIC CONTROL DEVICES

	ATTRIBUTE									
TRAFFIC MANAGEMENT DEVICE	VOLUME REDUCTION	SPEED REDUCTION	DIRECTIONAL CONTROL	NOISE AND POLLUTION	SAFETY	ACCESS RESTRICTIONS	EMERGENCY VEHICLE ACCESS	MAINTENANCE PROBLEMS	LEVEL OF VIOLATION	RECOMMENDED TREATMENT
Speed Bumps	Possible	Inconsistent	Unlikely	Increase	Hazard	None	Some Problems	Snowplow	Not Applicable	Do Not Use
Speed Undulations	Possible	Yes	Unlikely	No Change	No Documented Problems	None	No Documented Problems	No Documented Problems	Not Applicable	Currently Not Allowed by Oregon
Rumble Strips	Unlikely	Yes	Unlikely	Increase	Vehicles - Good Bicycles - Bad	None	No Problems	Snowplow	Not Applicable	Do Not Use
Diagonal Diverters	Yes	Likely	Possible	Decrease	Shifts Accidents	Left or Right Turn Only	Some Constraint	Vandalism	Low	Approved
Cul-de-sac	Yes	Likely	Yes	Decrease	Shifts Accidents	Total	Some Constraint	Vandalism	Low	Approved
Semi-Diverter	Yes	Likely	Yes	Decrease	Shifts Accidents	Restricted One Direction	Minor Constraint	Vandalism	Potentially High	Approved
Forced Turn Channelization	Yes	Likely	Yes	Decrease	Improved	Some	Minor Constraint	Vandalism	Potentially High	Approved
Median Barrier	Yes	None	Yes	Decrease	Improved	Right Turn Only	Minor Constraint	No Documented Problems	Low	Approved
Traffic Circle	Possible	Likely	Unlikely	No Change	No Documented Problems	None	Some Constraint	Vandalism	Low	Approved
Chokers	Unlikely	Minor	Unlikely	No Change	Improved for Pedestrians	None	No Problems	No Problems	Not Applicable	Approved
Stop Signs	Possible	No	Unlikely	Increase	Unclear	None	No Problems	No Documented Problems	Potentially High	If Warrant Criteria Met
One-Way Street	Yes	No	Yes	Decrease	Unclear	Restricted One Direction	Restricted One Direction	No Documented Problems	Low	Approved
Turn Prohibited Signs	Yes	Likely	Yes	Decrease	Improved	No Turn(s)	No Problems	No Documented Problems	Moderate	Approved

* Source: City of Portland Bureau of Traffic Management brochure, "Neighborhood Traffic Management Program"

COMPATIBILITY WITH TRANSPORTATION PLANNING RULE

DESCRIPTION OF THE TRANSPORTATION PLANNING RULE

The Oregon Land Conservation and Development Commission (*LCDC*) and ODOT developed the Transportation Planning Rule (*Rule*), which was adopted in April 1991. It is also referred to as Goal 12 which means that it is the twelfth goal adopted by LCDC (*e.g., Goal 3 refers to agricultural lands, Goal 4 to Forest Lands and Goal 14 to Urbanization*).

The *Rule* affects all jurisdictions, i.e., cities, metropolitan planning organizations (*MPOs*), and state agencies, within Oregon, and there are separate requirements for jurisdictions based on population size (*i.e., under 2,500 population, between 2,500 and 25,000 population, and over 25,000 population*) and geographic location (*within or outside of a metropolitan planning organization*). For smaller local governments (*those under 2,500 and those between 2,500 and under 25,000*), the *Rule* requires amendments to plans and ordinances which would require residential, commercial and industrial patterns that encourage pedestrian and bicycle travel. For larger jurisdictions, in addition to the above, the Rule requires development patterns that are designed for transit access with careful consideration given to alternatives to highway expansion, including transportation demand management measures (*carpooling, park-and-ride facilities, as well as parking space lids and congestion pricing, etc.*). For jurisdictions over 25,000 population that lie within one of the state's four MPOs (*i.e., the metropolitan areas of Portland, Salem, Eugene, and Medford*), the *Rule* also mandates that within 30 years total vehicle miles travelled (*VMT*) on a per capita basis is reduced by 20 percent from present levels, and that a parking plan be produced that reduces the number of per capita parking spaces by 10 percent.

Cities under 2,500 population and counties under 25,000 population that are located outside of a MPO may apply for whole or partial exemptions to Rule requirements.

OBJECTIVES OF THE RULE

The ultimate aim of the *Rule* is to encourage a multi-modal transportation network throughout the state that will reduce our reliance on the automobile and assure that local, state, and regional transportation systems "support a pattern of travel and land use in urban areas which will avoid the air pollution, traffic and livability problems faced by other areas of the country." In order to achieve compliance in the MPO jurisdictions, more trips will need to be accomplished by foot or by bicycle. This means that origins and destinations must be located within a comfortable walking or bicycling distance from each other. Thus, the major instrument for establishing the change in mode split will come from land use planning and decisions about land use applications.

In other words, the success of the *Rule* will be directly related to the ability of local planning commissions and City Councils to respect the integrity of the *Rule*, i.e., to turn

down land use application requests that would not achieve compliance with the *Rule*, and initiate efforts to help their communities comply with it on a land use basis.

PLANNING ISSUES

The principal planning requirement in the *Rule* is that cities, counties, MPO's and ODOT must prepare and adopt Transportation System Plans. MPO's must complete regional transportation system plans by May 1995. Cities and counties within MPOs must complete their local plans within a year of the MPO plan adoption, while jurisdictions outside of MPOs must complete plans by May 1996. These plans must provide for coordinated continuity of movements between modes and within geographic and jurisdictional areas, and shall:

- Consider all modes of transportation including mass transit, air, water, pipeline, rail, highway, bicycle and pedestrian;
- Be based on an inventory of local, regional, and state transportation needs;
- Consider the social consequences resulting from utilizing differing combinations of transportation modes;
- Avoid principal reliance on any one mode of transportation;
- Minimize adverse social, economic and environmental impacts and costs;
- Conserve energy;
- Meet the needs of the transportation disadvantaged;
- Facilitate the flow of goods and services to strengthen local economy; and,
- Conform with local and regional comprehensive land use plans.

PLANNING RULE REQUIREMENT FOR LINCOLN CITY

The City of Lincoln City is required to adopt a transportation system plan as part of its comprehensive plan and falls within the 2,500-25,000 population category to meet the Transportation Planning Rule requirements. The required elements of the plan are as follows:

1. A determination of transportation needs.

2. A coordinated network of transportation facilities adequate to serve state, regional, and local transportation needs.

3. A road plan for a network of arterials and collectors.

4. A public transportation plan which describes public transportation services for the transportation disadvantaged and identifies service inadequacies, describes intercity bus and passenger rail service and identifies the locations of terminals, and identifies existing and planned transit truck routes,

exclusive transit ways, terminals and major transfer stations, and park-and-ride stations.

5. A bicycle and pedestrian plan for a network of bicycle and pedestrian routes throughout the planning area.

6. An air, rail, water and pipeline transportation plan which identifies where public use airports, mainline and branchline railroads and railroad facilities, port facilities, and major regional pipelines and terminals are located or planned within the planning area. For airports, the planning area shall include all areas within the airport imaginary surfaces and other areas covered by state or federal regulations. This element will be in a separate document.

7. A transportation financing program. This element will be in a separate document.

8. Each element identified in 1 through 7 above shall contain an inventory and general assessment of existing and committed transportation facilities and services by function, type, capacity, and condition.

Element 6 above was beyond the scope of this planning effort and will need to be addressed by the City prior to adoption of its transportation system plan.

The identified transportation plan for Lincoln City meets all of the requirements of the Rule, and also addresses possible Transportation Demand Management strategies and an off-street parking development program.

As mentioned in Chapter 6.0 -- Roadway System Alternatives, a bypass around the east side of Lincoln City will require several exceptions to the LCDC planning goals, as most of the alignment would be outside the Urban Growth Boundary (unless these areas were annexed into the City.) The proposed limited access to the bypass would limit the amount of local trip making on this road, thus meeting the Rule requirement that local traffic be less than a third of the average daily traffic on the bypass.

PUBLIC FACILITIES PLAN REQUIREMENTS

A public facilities plan for transportation will also be required to fulfill the Oregon Revis ed Statutes, Chapter 197.712(2)e and conforms to the standards specified by Oregon Administrative Rules, Chapter 660, Division 11. These requirements were adopted prior to those of the Transportation Planning Rule and are similar but not all inclusive. This report addresses the requirements for the Public Facilities Plan.

TABLE 1

ACCESS MANAGEMENT TECHNIQUES

CATEGORY A

LIMIT NUMBER OF CONFLICT POINTS

- A-1: Install median barrier with no direct left-turn access
- A-2: Install raised median divider with left-turn deceleration lanes
- A-3: Install one-way operations on the highway
- A-4: Install traffic signal at high-volume driveways
- A-5: Channelize median openings to prevent left-turn ingress and/or egress maneuvers
- A-6: Widen right through lane to limit right-turn encroachment onto the adjacent lane to the left
- A-7: Install channelizing islands to prevent left-turn deceleration lane vehicles from returning to the through lanes
- A-8: Install physical barrier to prevent uncontrolled access along property frontages
- A-9: Install medial channelization to control the merge of left-turn egress vehicles
- A-10: Offset opposing driveways
- A-11: Locate driveway opposite a three-leg intersection or driveway and install traffic signals where warranted
- A-12: Install two one-way driveways in lieu of one two-way driveway
- A-13: Install two two-way driveways with limited turns in lieu of one standard two-way driveway
- A-14: Install two one-way driveways in lieu of two two-way driveways
- A-15: Install two two-way driveways with limited turns in lieu of two standard two-way driveways
- A-16: Install driveway channelizing island to prevent left-turn maneuvers
- A-17: Install driveway channelizing island to prevent driveway encroachment conflicts
- A-18: Install channelizing island to prevent right-turn deceleration lane vehicles from returning to the through lanes
- A-19: Install channelizing island to control the merge area of right-turn egress vehicles
- A-20: Regulate the maximum width of driveways

CATEGORY B

SEPARATE BASIC CONFLICT AREAS

- B-1: Regulate minimum spacing of driveways
- B-2: Regulate minimum corner clearance
- B-3: Regulate minimum property clearance
- B-4: Optimize driveway spacing in the permit authorization stage
- B-5: Regulate maximum number of driveways per property frontage
- B-6: Consolidate access for adjacent properties
- B-7: Require highway damages for extra driveways
- B-8: Buy abutting properties
- B-9: Deny access to small frontage
- B-10: Consolidate existing access whenever separate parcels are assembled under one purpose, plan, entity, or usage
- B-11: Designate the number of driveways regardless of future subdivision of that property
- B-12: Require access on collector street (when available) in lieu of additional driveway on highway

CATEGORY C

LIMIT DECELERATION REQUIREMENTS

- C-1: Install traffic signals to slow highway speeds and meter traffic for larger gaps
- C-2: Restrict parking on the roadway next to driveways to increase driveway turning speeds
- C-3: Install visual cues of the driveway
- C-4: Improve driveway sight distance
- C-5: Regulate minimum sight distance
- C-6: Optimize sight distance in the permit authorization stage
- C-7: Increase the effective approach width of the driveway (horizontal geometrics)
- C-8: Improve the vertical geometrics of the driveway
- C-9: Require driveway paving
- C-10: Regulate driveway construction (performance bond) and maintenance
- C-11: Install right-turn acceleration lane
- C-12: Install channelizing islands to prevent driveway vehicles from backing onto the highway
- C-13: Install channelizing islands to move ingress merge point laterally away from the highway
- C-14: Move sidewalk-driveway crossing laterally away from highway

CATEGORY D

REMOVE TURNING VEHICLES FROM THE THROUGH LANES

- D-1: Install two-way left-turn lane
- D-2: Install continuous left-turn lane
- D-3: Install alternating left-turn lane
- D-4: Install isolated median and deceleration lane to shadow and store left-turning vehicles
- D-5: Install left-turn deceleration lane in lieu of right-angle crossover
- D-6: Install medial storage for left-turn egress vehicles
- D-7: Increase storage capacity of existing left-turn deceleration lane
- D-8: Increase the turning speed of right-angle median crossovers by increasing the effective approach width
- D-9: Install continuous right-turn lane
- D-10: Construct a local service road
- D-11: Construct a bypass road
- D-12: Reroute through traffic
- D-13: Install supplementary one-way right-turn driveways to divided highway (noncapacity warrant)
- D-14: Install supplementary access on collector street when available (noncapacity warrant)
- D-15: Install additional driveway when total driveway demand exceeds capacity
- D-16: Install right-turn deceleration lane
- D-17: Install additional exit lane on driveway
- D-18: Encourage connections between adjacent properties (even when each has highway access)
- D-19: Require two-way driveway operation where internal circulation is not available
- D-20: Require adequate internal design and circulation plan

Source: Access Management for Streets and Highways, Federal Highway Administration, June 1982, p. 49

TABLE 2
WARRANTS FOR STRATEGIES

HIGH HIGHWAY VOLUME
(More Than 15,000)

OPERATIONAL PARAMETERS

LOW				MEDIUM				HIGH			
Multilane Divided											
A	B	C	D	A	B	C	D	A	B	C	D
6	2	2	5	1	1	2	3	2	2	1	1
7	3	3	6	2	2	3	5	4	3	2	2
9	5	4	7	5	3	4	6	5	4	3	3
11	6	5	8	6	4	5	7	6	5	4	5
12	7	6	14	7	5	6	8	7	6	5	7
13	8	7	16	8	6	7	14	8	7	6	8
14	9	8	17	9	7	8	16	9	8	7	9
15	10	9	18	11	8	9	17	11	9	8	10
18	11	10	19	12	9	10	18	14	10	9	11
19	12	11	20	13	10	11	19	17	11	10	12
20		12		14	11	12	20	18	12	11	13
		14		15	12	13		20		12	14
				17		14				13	15
				18						14	16
				19							17
				20							18
											19
											20
Multilane Undivided											
A	B	C	D	A	B	C	D	A	B	C	D
11	2	2	4	1	1	2	3	2	2	1	1
14	3	3	16	2	2	3	4	3	3	2	2
15	5	4	17	3	3	4	14	4	4	3	3
18	6	5	18	8	4	5	16	8	5	4	4
19	7	6	19	11	5	6	17	11	6	5	9
20	8	7	20	12	6	7	18	12	7	6	11
	9	8		14	7	8	19	14	8	7	12
	10	9		15	8	9	20	16	9	8	13
	11	10		16	9	10		17	10	9	14
	12	11		17	10	11		18	11	10	15
		12		18	11	12		20	12	11	16
		14		19	12	13				12	17
				20		14				13	18
										14	19
											20
Two-Lane											
A	B	C	D	A	B	C	D	A	B	C	D
11	2	2	4	3	1	2	3	3	2	1	3
14	3	3	14	8	2	3	4	4	3	2	4
15	5	4	16	11	3	4	14	8	4	3	9
18	6	5	17	12	4	5	16	11	5	4	11
19	7	6	18	14	5	6	17	12	6	5	12
20	8	7	19	15	6	7	18	14	7	6	14
	9	8	20	16	7	8	19	16	8	7	15
	10	9		17	8	9	20	17	9	8	16
	11	10		18	9	10		18	10	9	17
	12	11		19	10	11		20	11	10	18
		12		20	11	12			12	11	19
		14			12	13				12	20
						14				13	
										14	

Source: Access Management for Streets and Highways, Federal Highway Administration, June 1982, p. 87

TABLE 2 (Cont.)

Operational Evaluation Parameters

Level of Development	Number of Commercial Driveways per Mile	Average
Low	0-30	15
Medium	31-60	45
High	>60	75
Highway Volume	**ADT Range**	**ADT Average**
Low	0-5,000	3,000
Medium	5,001-15,000	10,000
High	>15,000	20,000
Commercial Driveway Volume	**ADT Range**	**ADT Average**
Low	0-500	250
Medium	501-1,500	1,000
High	>1,500	2,000

Source: Access Management for Streets and Highways, Federal Highway Administration, June 1982, p.72