Creswell/Interstate 5 Interchange Refinement Plan

Oregon Department of Transportation
August 1999

Creswell/Interstate 5 Interchange Refinement Plan

The Creswell/I-5 Interchange Refinement Plan was created in close consultation with the Creswell Citizen Advisory Committee (CAC) during its work on the Creswell Transportation System Plan (TSP). The CAC reviewed and commented on every aspect of the Refinement Plan and its relationship to the TSP. The CAC also assisted and guided ODOT with the open houses for public review of the plan.

It is a tremendous effort by citizens to donate their time and effort to formulate public policy. Night meetings and the constant review of transportation information are a consuming and tedious process and a personal sacrifice. Therefore, the persistent and diligent work by the Creswell CAC is acknowledged and greatly appreciated by the Oregon Department of Transportation (ODOT). This Refinement Plan is a reflection of the CAC and its success will be measured by the acceptance of Creswell citizens.

Creswell Transportation Advisory Committee

Heidi Stalder (Chair)	Bus Service
Walt Sands (Vice-Chair)	Business
Alan Bennett	Bicyclist
Sue Gill	School Business
Ron Petitti	Developer
Erbine Grousbeck	Senior/Disabled
Dan Moore	Fire Department
Ed Collins	Police Department
Mike Nelson	Airport
Ed McClusky	Mayor
Majorie Pound	Planning Commission
Ron Hanson	Staff, City Administrator
Tracy Brown	Staff, TSP Project Manager, Lane Council of Governments

ODOT Technical Team

Gerry Juster	Preliminary Design, ODOT
Scott McCanna	Preliminary Design, ODOT
Brian Dunn	Traffic Analysis, ODOT
Harlan Nale	Traffic Analysis, ODOT
Nick Arnis	Region 2 Planning, ODOT, Project Manager

The inclusion of proposed projects and actions in this plan does not obligate or imply obligations of funds by any jurisdiction for project level planning or construction.

However, the inclusion of proposed projects and actions does serve as an opportunity for the projects to be included, if appropriate, in documents such as the State Transportation Improvement Program (STIP). Such inclusion is not automatic. It is incumbent on the state, county, city, and general public to take action to encourage and support inclusion into the STIP at the appropriate time.

Projects included in the STIP are required to have funds available so the number of projects that can be included are constrained by funding levels.

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Executive Summary

The basis for creating a Creswell/Interstate 5 Interchange Refinement Plan stems from the need and requirement to prepare a Creswell Transportation System Plan (TSP). Officials from the Oregon Department of Transportation (ODOT), Lane Council of Governments (LCOG), and the City of Creswell recognized the necessity for a more detailed study of the interchange during the course of the TSP. In addition, there is a large amount of vacant commercial land east of the interchange that eventually will be developed. The current interchange design no longer meets federal or state design requirements. Funds for the interchange plan and Creswell TSP were made available from the Region 2 Corridor Planning Program. The interchange plan was coordinated with the Creswell Citizen Advisory Committee (CAC) during their work on the TSP.

Preferred Alternative (Figure 1)

Through expert analysis, CAC review and recommendations, and public participation, a recommended alternative was chosen to submit for local and state adoption. **Concept 1 was recommended as the preferred alternative. A major theme for this alternative is the protection and management of the existing and future investment while creating a safe and efficient transportation facility with direct public involvement.**

Intent and Need

There are three primary reasons for improving the interchange and the Goshen–Divide Highway: to enhance access management, improve the safety and operation of the facility for all modes of travel, and plan for projected growth in the urban growth boundary (UGB). Specific reasons for choosing Concept 1 as the preferred alternative include:

- **Achievement of Level of Service (LOS) criteria for interchange and local streets**
- **The interchange design met or exceeded the design goal, objectives, and criteria especially relating to safety and operations of the ramp terminals and for the various transportation modes that would use the interchange.**
  Its cost effectiveness given the proposed concept designs for the Goshen-Divide/Oregon Avenue intersection.
- **The Goshen-Divide realignment has fewer right of way impacts than the other proposed concepts.**
- **The Creswell CAC, with public input, and ODOT reviewed and analyzed the concepts and agreed on this idea.**

KINGS ROW

OREGON AVENUE

GOSHEN - DIVIDE HIGHWAY

MILL ST.

SOUTHERN PACIFIC RAILROAD

FRONT ST.

GOSHEN - DIVIDE HIGHWAY

SUGGESTED LOCATION FOR LOCAL ACCESS POINT

POST OFFICE

SUGGESTED LOCATION FOR LOCAL ACCESS POINT

POSSIBLE LOCAL CIRCULATION POINTS

MARKET ROAD

PACIFIC HIGHWAY (I-5)

KOA

ZINKER LANE

MELTON ROAD

Figure 1

PREFERRED ALTERNATIVE

CRESWELL INTERCHANGE REFINEMENT PLAN
SEPTEMBER 30, 1997

**** *Major Realignment of* ****
*** *S. GOSHEN-DIVIDE HWY.* ***
*** *Railroad Grade Separation* ***

LEGEND

Traffic Signal

New Construction

Right of Way Impact

Bridge

Concept 1 Description

The I-5 undercrossing structure is significantly improved:

- The bridge is rebuilt to modern design standards, which includes widening to four lanes of traffic with shoulders;
- The profile grade is improved;
- Pedestrian, bicycle, and vehicular mobility and access is significantly improved;
- The east and west ramp terminals are redesigned;
- When warranted, a southbound entrance ramp is installed; and
- Oregon Avenue is a five-lane section built to urban standards.

Melton Road at the east ramp terminal is aligned further east, at least 150 meters away from the ramp. The southbound ramp, on the west side, is also moved 70 meters further to the east from its existing location.

When criteria are met, there are traffic signals at the northbound and southbound ramp terminals, and Goshen-Divide Highway/Mill Street.

The intersection of Goshen-Divide and Oregon Avenue (Springfield-Creswell Highway) is redesigned. There is one traffic signal at this location, the primary intersection is Goshen-Divide and Mill Street.

Goshen-Divide Highway is realigned south of Oregon Avenue (Springfield-Creswell Highway). A bridge is built over the railroad crossing from Mill Street to intersect with an extension of King's Row to the east. The south terminus is north of Market Road and Mill Street is improved to urban standards (additional turn lanes, sidewalks, and drainage).

There are median treatments along Oregon Avenue (Springfield-Creswell Highway) from the southbound ramp terminal to Front Street. ODOT, City of Creswell, and local business and property owners should create an access management plan. This plan should at least implement a local circulation pattern for the area south and north of Oregon Avenue that is bounded by Oregon Avenue, Mill Street, and Goshen-Divide Highway.

Cost:

Local Street/Highway 99	$6.0 million
Interchange	$7.5 million
Total	$13.5 Million

The Major Issues

The location of existing local streets and other access points near the interchange ramps are ill defined and create safety and operation problems. It is estimated that by 2015 the ramp terminals will operate at LOS F. Median treatments do not exist on the streets (Springfield-Creswell Highway) leading to the ramp terminals and there are no comprehensive access management policies for this area.

The interchange was built in 1954 and is now obsolete. Sight distances, truck turning movements, and other modes of travel are limited given the current design; the preferred alternative will improve the safety and operations of the facility. Additionally, the Goshen-Divide intersection with Oregon Avenue (Springfield-Creswell Highway) will operate at an unacceptable LOS E in the future and, consequently, should be improved and realigned. Improving the intersection will also enhance the safety of this system.

Large vacant commercial parcels within the UGB exist to the east of the interchange. There are also vacant commercial parcels to the southwest of the facility, also in the UGB. Build-out of these parcels should be anticipated and planned. Presently, a developer is proposing a large commercial and residential development on the vacant parcels northeast of the interchange. The preferred alternative or redesign of the interchange anticipates this growth by improving the operations of the facility and implementing access management policies and principles for side streets and driveways near the ramp terminals.

Public Involvement

An important aspect of this plan concerns the input and recommendations from the CAC and general public. **The Refinement Plan will not be implemented unless it is adopted or endorsed locally and at the state level; therefore, public participation is critical.**

The CAC acted as the Creswell advisory group to review all aspects of the plan. The ODOT project manager for this plan attended nearly every CAC discussion about the TSP and interchange plan. The CAC was instrumental in reviewing and recommending changes to the design concepts and other technical transportation information. In addition, elements of the Refinement Plan were reviewed and comments were received at a public open house. The open house was well attended and provided valuable information regarding interchange and local street ideas in the design concepts.

Methodology

The Refinement Plan followed an inductive approach: general facts and findings were collected and needs and alternatives were created. A primary method for the plan was to synthesize the wide range of issues and problems about the interchange and then develop options and solutions for a preferred alternative. Traffic counts, accident data, land use inventories, environmental constraints, local plans, and transit/transportation demand

management (TDM) information were gathered. Also, the ODOT technical team, CAC, and Creswell citizens produced an analysis of the real and perceived issues and problems with the interchange.

Information contained in the Creswell TSP such as the traffic modeling output, land use scenarios, and growth estimates were utilized in the development of the interchange plan. The EMME/2 transportation model at LCOG was used to model current and projected traffic volumes in Creswell.

From the findings and data collected, design concepts were created to address the issues and problems at and near the interchange.

Implementation Strategies

The Refinement Plan is a long-range plan. The primary implementation goals are to:

1. Adopt or endorse the Refinement Plan,
2. Protect and manage the future preferred design investment,
3. Place the interchange project in the next major State Transportation Improvement Program (STIP) update, and
4. Build the Preferred Alternative.

Acceptance and adoption of this plan are the first steps towards funding and construction. The plan must be adopted or endorsed by the City of Creswell, Lane County, and the Oregon Transportation Commission (OTC). These adoptions should occur simultaneously and in a collaborative environment. Adoption at the local and state levels ensure public and official support for the preferred alternative.

The Refinement Plan preferred alternative will be used by ODOT and the City of Creswell as a guide when making land use decisions and street improvements. The alignment of the preferred alternative is a long-range idea; there are no project funds at this time identified by the state.

Introduction

Background Information

This document is one in a series of transportation plans commissioned by ODOT for the purpose of studying major highways within Oregon. A system plan for Creswell was initiated in response to the future development of commercial and industrial lands near the I-5 interchange and in response to the Transportation Planning Rule (TPR). In addition, the City is located within five miles of the Eugene -Springfield urban growth boundary (UGB) along Interstate 5 (See Figure 2). The TPR and the federal 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) require this level of planning for transportation facilities.

A Refinement Plan for this interchange is one of several facility planning efforts occurring along I-5 in the Willamette Valley. Efforts are underway to conduct similar types of interchange plans in the Eugene-Springfield area and other sections of the I-5 corridor in Oregon.

Study Area

There are four study areas associated with the interchange. Two are broad and were utilized for initial overviews: transportation volumes on I-5 and Potential Development Impact Area (PDIA) data outside the Creswell UGB. Two other study areas were more focused on the interchange and Creswell: the Creswell UGB for planning projections/land use and the immediate interchange impact area for the concept designs (See Figure 3).

History

Chronology of construction projects at the interchange

Originally built in 1953-1954

- Grading and paving in 1953
  Overcrossing structure in 1954

1960

- Widen I-5 to 2 through lanes in the northbound and southbound direction.

1966

- Geometric revisions to the interchange ramp curvature in 1966
- Widen off-ramp structures in 1966

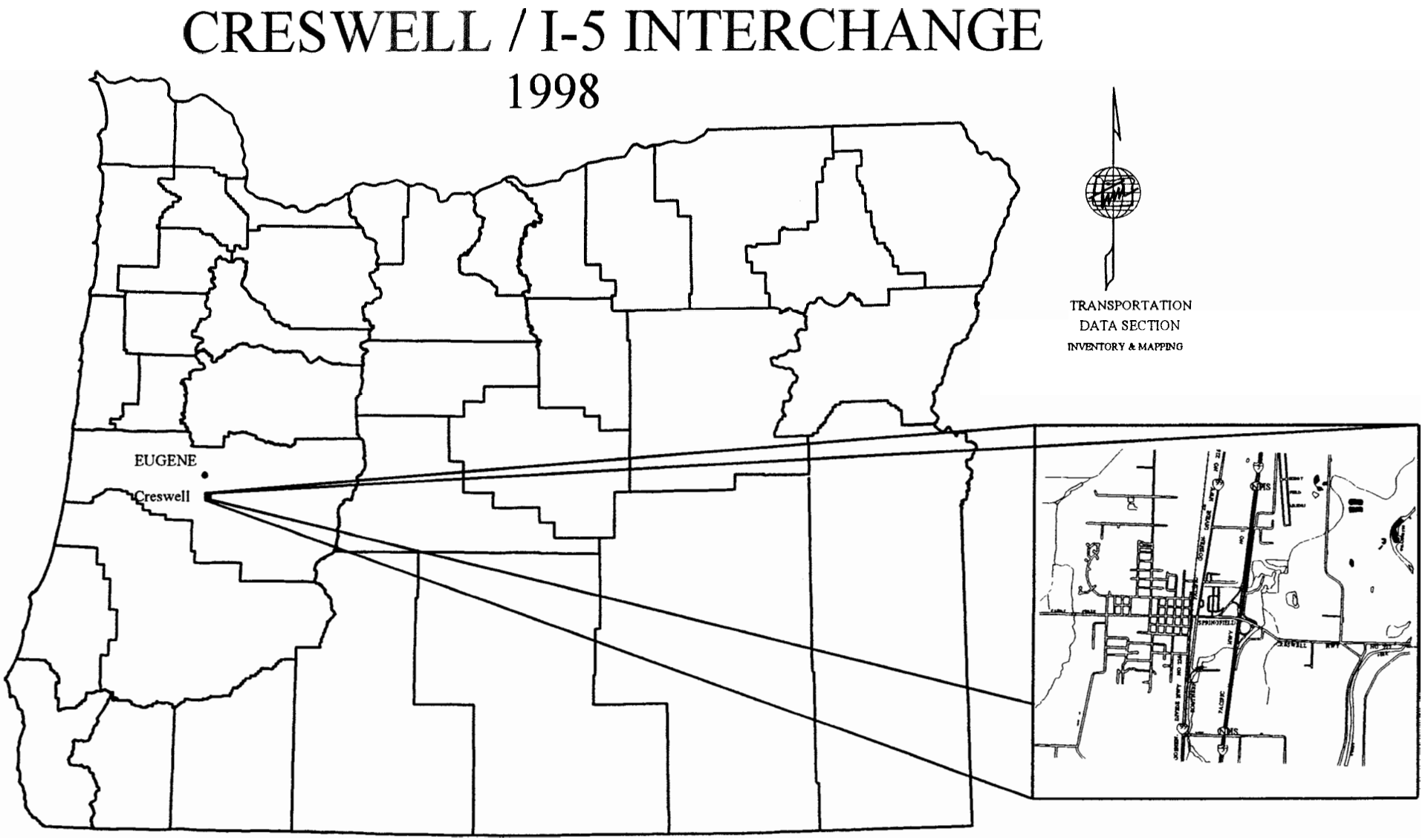
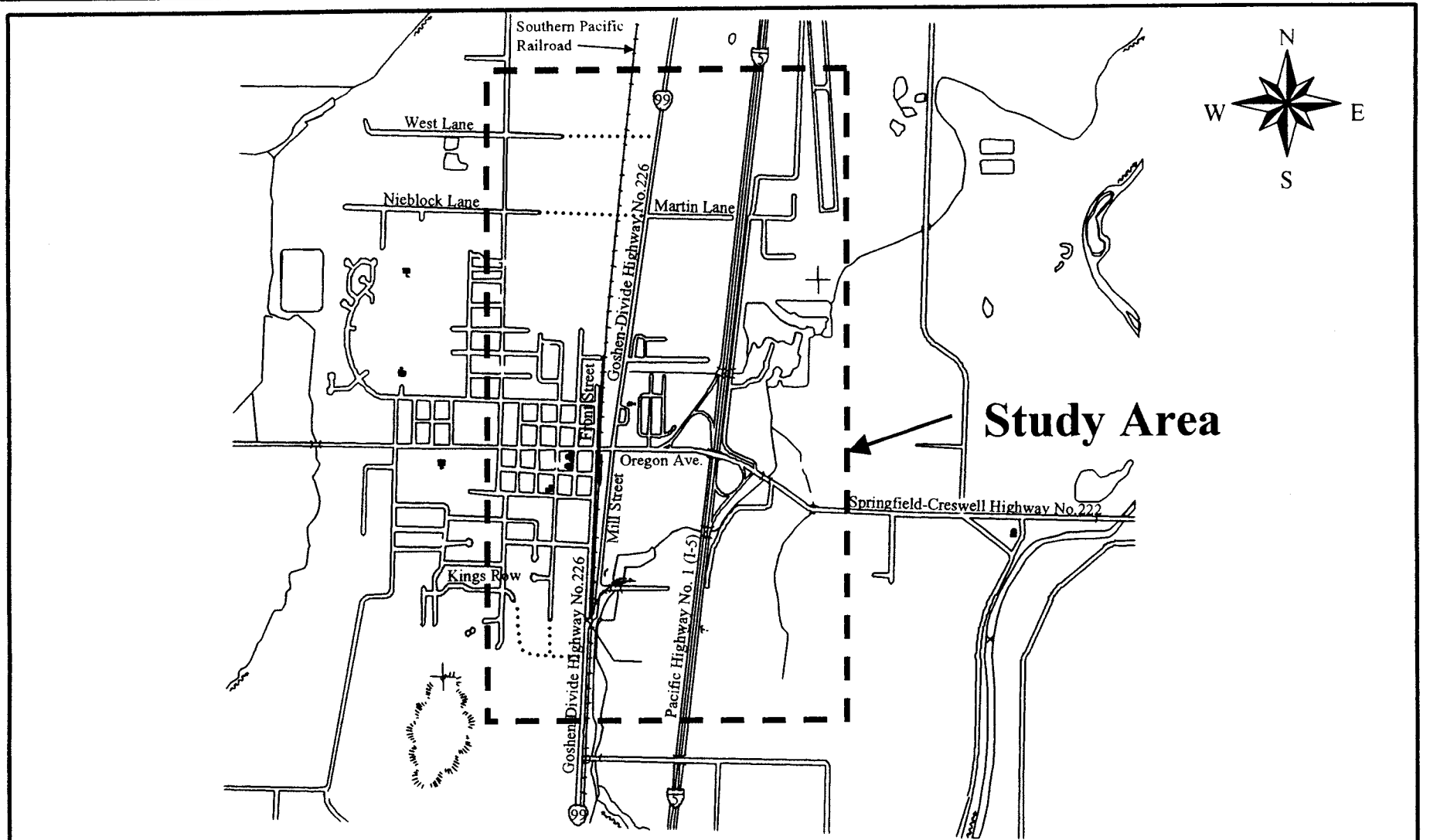

CRESWELL / I-5 INTERCHANGE
1998
TRANSPORTATION
DATA SECTION
INVENTORY & MAPPING
EUGENE
Creswell

Figure 2



City of Creswell, Oregon

OREGON DEPARTMENT OF TRANSPORTATION TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Interchange Refinement Plan	**File : Creswell~1.PPT**	**Prepared By: Harlan Nale**	FIGURE 3
	Date : 11/21/97	**Reviewed By: Brian Dunn**	

1969
Guard rail, median barrier, drainage and bridge column embankment protection improvements.

1975
Median and shoulder slopes flattened, minor drainage improvements.

Planning Framework, Process, and Policies

There are three types of corridor planning in Oregon Department of Transportation (ODOT). This planning for an entire corridor. General Planning identifies the priority and timing for basic transportation improvements such as a passing lane in a future year. The general plan is usually all that is necessary for small cities and rural areas.

Larger cities generally require a different level of effort, known as system planning. The system plan contains a greater amount of detail. It may suggest widening of a local street feeding into a state road, addition of turn lanes, or rerouting other city streets that have an impact on the corridor.

For most corridors, the system plan and the general plan will meet all of the planning requirements. In some cases, however, a third corridor plan, called the refinement plan, is necessary. The refinement plan is normally an outgrowth of general and/or system plans. In this case, the Creswell/I-5 Refinement Plan is an outgrowth of the Creswell Transportation System Plan. A refinement plan is a detailed analysis of a facility or specific section of a corridor. These types of plans, depending on the level of information needed, tend to include an in-depth analysis of transportation issues, offer a range of concepts or alternatives, and select a preferred solution.

Work on the plan began when the ODOT technical team created a draft scope of work for review and comment to the Creswell Citizen Advisory Committee (CAC). The scope of work was also reviewed by ODOT plan managers in Region 2. It covered:

1. Definition of objectives and TSP coordination
2. Definition of issues and assumptions
3. Base case analysis
4. Definition of a range of plan alternatives
5. Selection of a preferred alternative
6. Final recommendations
7. Implementation

Public participation underlies all scope of work elements. The Creswell CAC acted as the City committee responsible for review and comment on all sections of the Refinement Plan. At major milestones in the course of the study, public open houses were held to review and comment on the plan. Public acceptance of the Refinement Plan is critical for

adopting the plan at the local and state levels. Without public support and subsequent adoption, the Refinement Plan will not be implemented.

ODOT decided to perform the technical work in house. Engineers from Preliminary Design, Traffic Planning and Analysis, and the ODOT Region 2 Planner for the Eugene-Springfield area formed the technical team and were the primary contributors for conducting the analysis for the plan. The Region 2 Planner acted as project manager for the plan. Lane Council of Governments (LCOG) provided assistance during the public involvement and transportation modeling phases of the work.

The plan began in late spring 1996 with meetings between ODOT, the City of Creswell, and LCOG. The Creswell CAC began meeting summer 1996 to begin their TSP. Review of the plan takes place at the local and state levels of government. At the local level, the City of Creswell and Lane County will review and comment on the Refinement Plan. At the state level, the draft plan is reviewed by ODOT Region 2, ODOT management, and the Oregon Transportation Commission (OTC).

Guiding policies during the planning process were:

The Oregon Transportation Plan;
The Oregon Highway Plan;
The Creswell Comprehensive Plan;
The Transportation Planning Rule;
The Bypass and Major Improvement Planning Policy;
The Willamette Valley Transportation Strategy;
The Federal Register Vol. 55, Additional Interchanges to the Interstate System;
The State Agency Coordinating Agreement; and
The Draft Interchange Access Management Policy.

Project Goals and Objectives

There are two broad categories for the Refinement Plan goals and objectives: 1) Objectives for project success and delivery and 2) the goal, objectives, and design criteria for creation of the interchange design concepts. The latter goal and objectives are presented in the Concepts and Preferred Alternatives section.

Project Success and Delivery

The overall goal was to create a Refinement Plan for the Creswell/I-5 interchange. Valid and reliable data, and a reasoned approach to determining problems and solutions were incorporated during the Refinement Plan study. It was also determined that a successful plan effort needed guiding objectives during its development. Two sets of objectives were created: objectives for project success and for project delivery. Project manager and steering committee (Creswell CAC) roles and responsibilities were created to clarify how and why decisions were to be made. These objectives,

roles, and responsibilities were reviewed and accepted by the ODOT technical team and the Creswell CAC.

Objectives

A. Objectives for project success

1. Define roles, responsibilities, accountability, and evaluation for individuals, committees, and teams
2. Allow for flexibility while recognizing time and resource constraints.
3. When possible, create consensus at the committee and public level.
4. Empower individuals and committees to be creative and solve problems.
5. Create motivated and committed individuals and committees.
6. Recognize and identify problems and issues quickly and deal with them effectively.
7. The project manager actively seeks and values individual and committee input.
8. The project manager and committee share in the authority and responsibility of the project.

B. Objectives for project delivery

1. Create Refinement Plan for State Transportation Improvement Program review and Creswell TSP.
2. Define transportation and design problems and create strategies.
3. Define a vision for the interchange plan.
4. Create effective citizen and technical committees.
5. Design an effective public participation plan.
6. Identify key constraints to project solutions.
7. Build consensus on preferred alternative.
8. Maintain project scope but remain flexible to changes.

Roles of ODOT and citizen committee participants

Project manager responsibilities

- Assume responsibility and accountability for project.
- Manage scope of work:
  - Establish direction
  - Project planning
  - Priority scheduling
  - Reporting
- Strive for synthesis of ideas, issues, solutions, and resources
  - Motivate and inspire individuals and committees
  - Align individuals and resources to tasks
- Liaison to public and local jurisdictions
- Cost control and billing

Logistics and resource support

- Facilitator to technical and citizen committees
- Responsible for implementation of project results

Individuals in the Steering Committee

- Assume responsibility and accountability for project goals and tasks

Logistics and resource support

- Strive for consensus of ideas and solutions
- Assume a high degree of motivation
- Utilize talents and creativeness
- Create and participate in project planning
- Review cost and schedule
- Participate in implementation

Chapter 1:
Transportation Inventory and Conditions

This section describes the existing conditions of the interchange and surrounding area. Besides the transportation systems and facilities, this section also focuses on land uses and environmental conditions. Sections of analysis cover: roads and streets, the interchange, traffic volumes, transit, transportation demand management, pedestrians and bicycles, accidents, access, and land uses and environmental conditions (current designations, vacant parcels, and environmental constraints).

Local Roads and Interchange

State Highway 222 (Springfield-Creswell Highway) approaches the interchange from the east, crossing the bridge structure and continuing west to the intersection with State Highway 226 (Goshen-Divide). Springfield-Creswell Highway is also Oregon Avenue. Highway 222 is a controlled access highway east of the northbound ramp terminal to Dale Kuni Road and beyond, whereas from the southbound terminal, there is controlled access for about 275 meters (m) on the south side of Highway 222 (See Figure 4).

Local roads to the east of the interchange consist of Melton Road, which accesses Springfield-Creswell Highway very near the northbound ramp terminal; Zinker Lane, which is 100 m from the ramp terminal; and Brookhurst Street, which is easily 500 m from the ramp terminal; Dale Kuni Road, which serves the Emerald Valley Golf Course, is about 700-800 m from the northbound ramp.

There is one major road connection from the southbound ramp terminal: the Goshen-Divide Highway and Mill Street intersection. There are, however, numerous driveways and undefined access points located the length of Springfield-Creswell Highway from the southbound ramp to the Goshen-Divide intersection.

Traffic Volumes

Base Traffic

The base year (1996) Average Daily Traffic (ADT) and Design Hour Volumes (DHV) were determined using manual and hose counts that were collected in the vicinity. The DHV are approximately equal to the summer P.M. Peak Hour traffic volumes. The ADT shown has been adjusted seasonally to reflect Average Annual Daily Traffic (AADT) for an average day. Figure 5 shows Year 1996 Traffic Volumes and analytic results for the existing transportation facility.

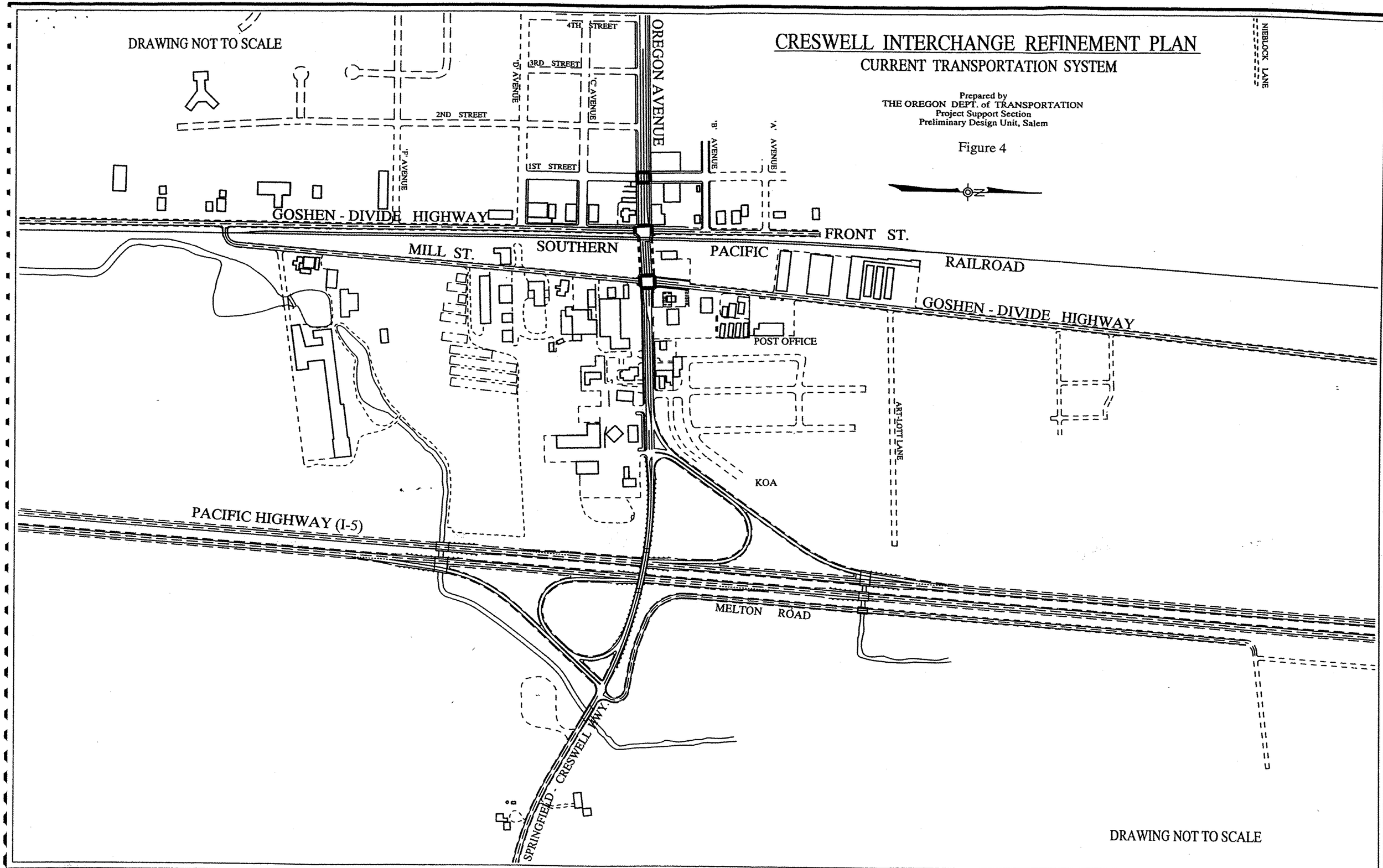
DRAWING NOT TO SCALE

CRESWELL INTERCHANGE REFINEMENT PLAN

CURRENT TRANSPORTATION SYSTEM

Prepared by
THE OREGON DEPT. of TRANSPORTATION
Project Support Section
Preliminary Design Unit, Salem

Figure 4



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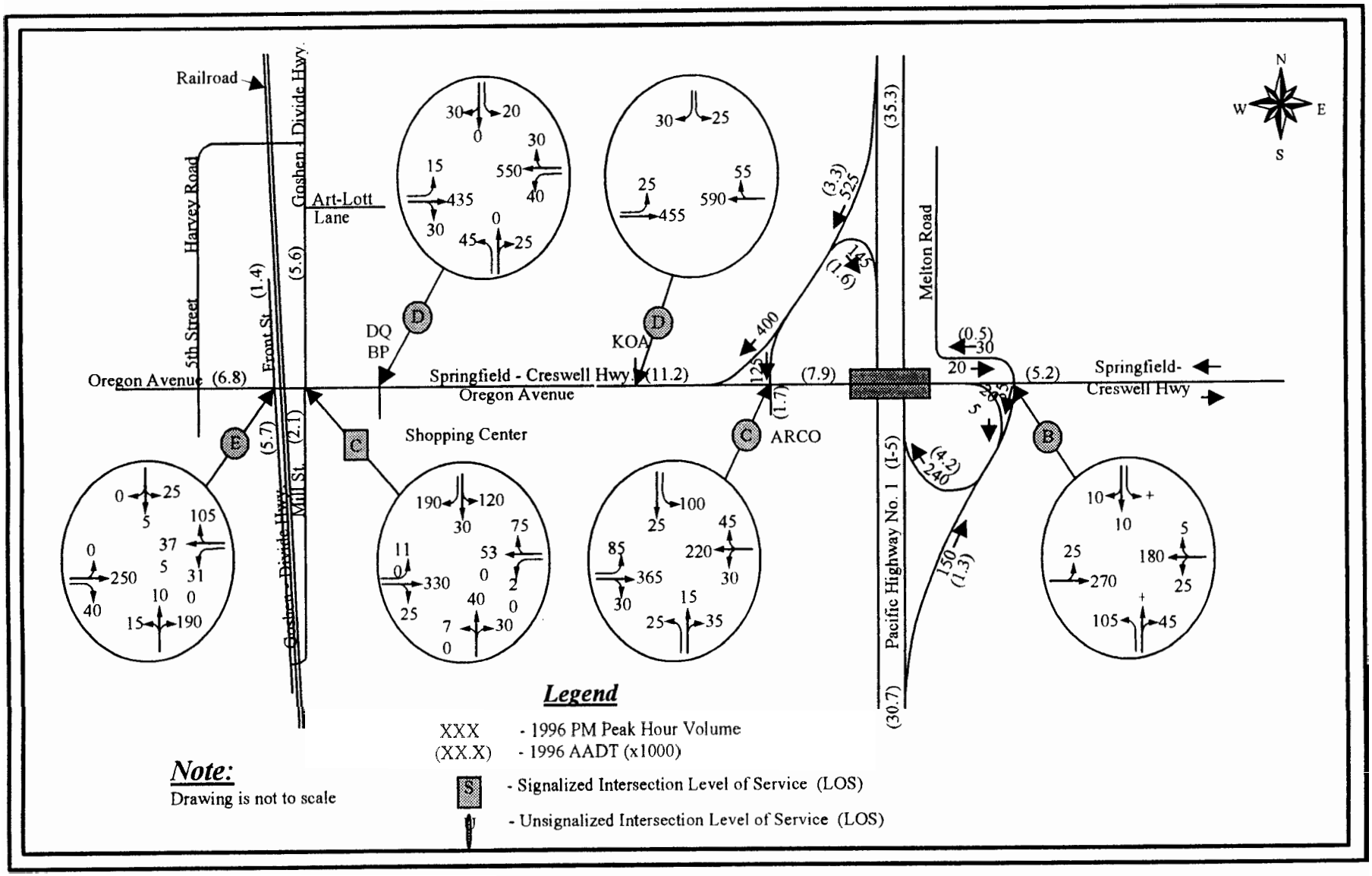


OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, No Build Option - No TSP Extensions **1996 Design Hour Volumes**	FILE : Creswell-2.PPT	Prepared By: Harlan Nale	FIGURE 5
	DATE : 12/18/97	Reviewed By: Brian Dunn	

Table 1 shows the manual classification count locations and Table 2 shows the hose count locations.

Table 1: 1996 Manual Classification Count Locations

Main Street	Cross Street	Counted:	Duration:	By:
Springfield-Creswell Highway	I-5 Northbound Ramps & Melton Rd.	7/96	14 hour	ODOT
Oregon Avenue	I-5 Southbound Ramps & Driveway	7/96	14 hour	ODOT
Oregon Avenue	I-5 Southbound Ramps & Driveway	4/97	3 hour	ODOT
Mill Street & Goshen-Divide Highway	Oregon Avenue	4/97	3 hour	ODOT
Front Street & Goshen-Divide Highway	Oregon Avenue	9/93	16 hour	ODOT
1st Street	Oregon Avenue	9/97	4 hour	Charbon-neau Eng
Front Street & Goshen-Divide Highway	Oregon Avenue	5/97	1 hour	ODOT

Table 2: 1996 Hose Count Locations

Location	Counted:	Duration:	By:
KOA Entrance	8/96	48	ODOT
Oregon Avenue – East of Mill Street	8/96	48	ODOT
Oregon Avenue – West of Mill Street	8/96	48	ODOT
Goshen-Divide Highway – North of Oregon Avenue	8/96	48	ODOT
Mill Street – South of Oregon Avenue	8/96	48	ODOT

Traffic Analysis Methodologies

The storage lengths required at the signalized intersections are provided by an ODOT computer model called SIGCAP2 and are consistent with the methodologies found in National Cooperative Highway Research Project Report 348, *Access Management Guidelines for Activity Centers.*

The peak hour volumes at unsignalized intersections were analyzed using another ODOT model called UNSIG10. This program uses reserve capacity of a lane to determine a LOS. The reserve capacity is equal to the capacity of a lane at an

unsignalized intersection minus the demand volume for that lane. The reserve capacities are broken into six levels and each is given a letter designation, from A through F, for identification purposes. The Level of Service designation A represents the best while F is the worst. The LOS designation for unsignalized intersections generally applies only to the left-turning vehicle from the minor street or from the main street. Through traffic on the main street does not necessarily operate at the designated unsignalized LOS.

The levels of service for the ramp connections were analyzed using Chapter 5, *Ramps and Ramp Junctions* of the 1994 Transportation Research Board, Special Report 209, *Highway Capacity Manual* (HCM).

The ODOT Transportation Planning Analysis Unit (TPAU) uses Signal Warrant 1 (Minimum Vehicular Traffic) and Warrant 2 (Interruption of Continuous Traffic) from the *Manual on Uniform Traffic Control Devices* (MUTCD). These warrants deal primarily with high volumes on the intersecting minor street, and high volumes on the major street. Meeting preliminary signal warrants does not guarantee that a signal will be installed. Before a signal can be installed, a field warrant analysis will be conducted by ODOT Region 2 office. If warrants are met, the ODOT Traffic Management Section will make the final decision on the installation of a signal on the State Highway System.

The minimum LOS standards for this analysis are listed in the goals and objectives: **LOS B for freeway, LOS C for ramp terminals, and LOS D for city intersections.**

Current Traffic Volumes and Levels of Service

Traffic volumes were measured for the interchange ramps and overcrossing for 1996. Breakdown of the traffic volumes were done for ADT and for the PM Peak Hour (See Figure 5).

On the interchange, the highest daily traffic for 1996 occurred on the bridge and was estimated at 7,900 vehicles. The northbound loop ramp had 4,200 daily trips while the southbound exit had 3,300 trips.

For the PM peak volumes in 1996, the highest volumes occurred on the southbound exit ramp: 525 vehicles exited I-5, of these about 400 continued on Oregon Ave. (Springfield – Creswell Highway) and the other 125 arrived at the ramp terminal. The bridge and northbound loop also had higher levels of volumes during the PM peak, 365 and 240 vehicles, respectively.

LOS in 1996 for the northbound ramp terminal was B while the southbound terminal was a C. Along Oregon Avenue, a LOS of D was calculated at the KOA entrance, another LOS of D at the BP/Dairy Queen entrances, a LOS of C at the Goshen-

Divide/Mill Street intersection, and LOS E at Front St./Goshen-Divide Highway intersection.

Transit

There is currently no fixed public transit system in Creswell. A Lane Transit District (LTD) pilot program in conjunction with the City of Cottage Grove is being implemented for a limited duration; it began September 1997 and will last one year. The intent is to ascertain the relevance and feasibility for transit in these communities. In a 1996 election, the residents of Creswell rejected a proposal to partly fund LTD service.

Transportation Demand Management

There is no known Transportation Demand Management (TDM) program in the City of Creswell. Voluntary TDM or informal demand management programs may exist in some businesses and with residents in Creswell, but a formal program is not in use at this time.

Bicycles and Pedestrians

The bike and pedestrian connections at the interchange ramps and bridge are substandard and do not met ODOT design guidelines for these modes. There is only a one-foot (0.3 meter) shoulder across the bridge and a narrow sub-standard shoulder for pedestrians or bicyclists at the ramp terminals. According to the classification counts conducted over a two-day period in July 1996, ten pedestrians crossed the interchange bridge.

There were between 8 and 4 bicyclists recorded that used the interchange during the same period of time.

Accidents

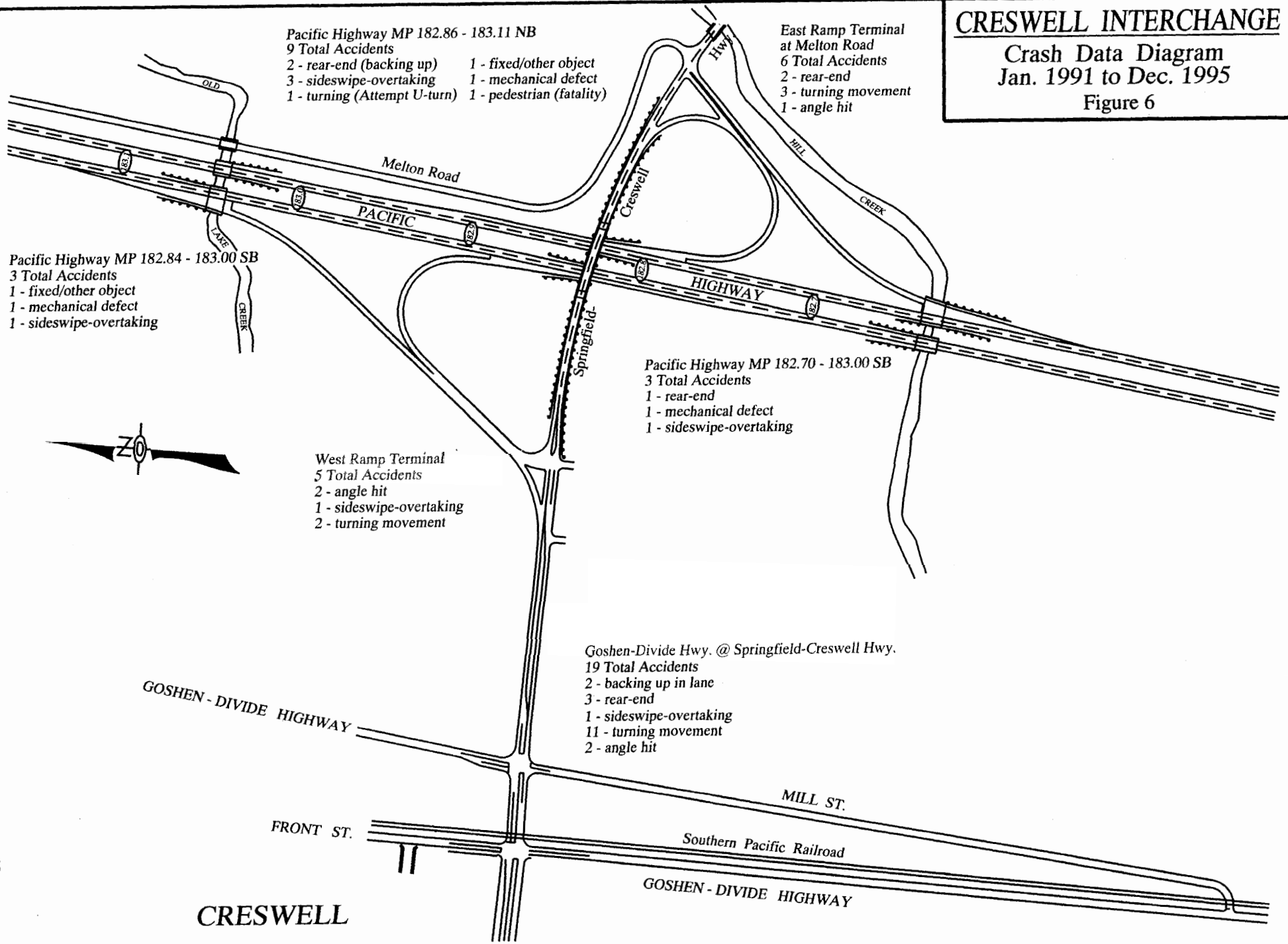
Accidents were assessed at two primary locations: the interchange area and the intersection of Goshen-Divide/Mill Street (See Figures 6 and 7). Accident data are from January 1991 to December 1995. There were no identified State Priority Safety Priority sites at or near the interchange; there was one pedestrian fatality between 1991 and 1995 on Interstate 5.

Interchange

East Ramp Terminal at Melton Road 6 total accidents: 2 rear-end 3 turning movement 1 angle hit	West Ramp Terminal 5 total accidents: 2 angle hit 1 sideswipe–overtaking 2 turning movement
Pacific Highway MP 182.70 to 183.00 (southbound) 3 total accidents: 1 rear-end 1 mechanical defect 1 sideswipe	Pacific Highway MP 182.84 to 183.00 (southbound) 3 total accidents: 1 fixed/other object 1 mechanical defect 1 sideswipe-overtaking
Pacific Highway MP 182.86 to 183.11 (northbound) 9 total accidents: 2 rear-end (backing up) 3 sideswipe—overtaking 1 turning(attempted U-turn) 1 fixed/other object 1 mechanical defect 1 pedestrian (fatality)	Goshen-Divide Highway at Springfield-Creswell Highway 19 total accidents: 11 turning movement 3 rear end 2 backing up 2 angle hit 1 sideswipe—overtaking

CRESWELL INTERCHANGE

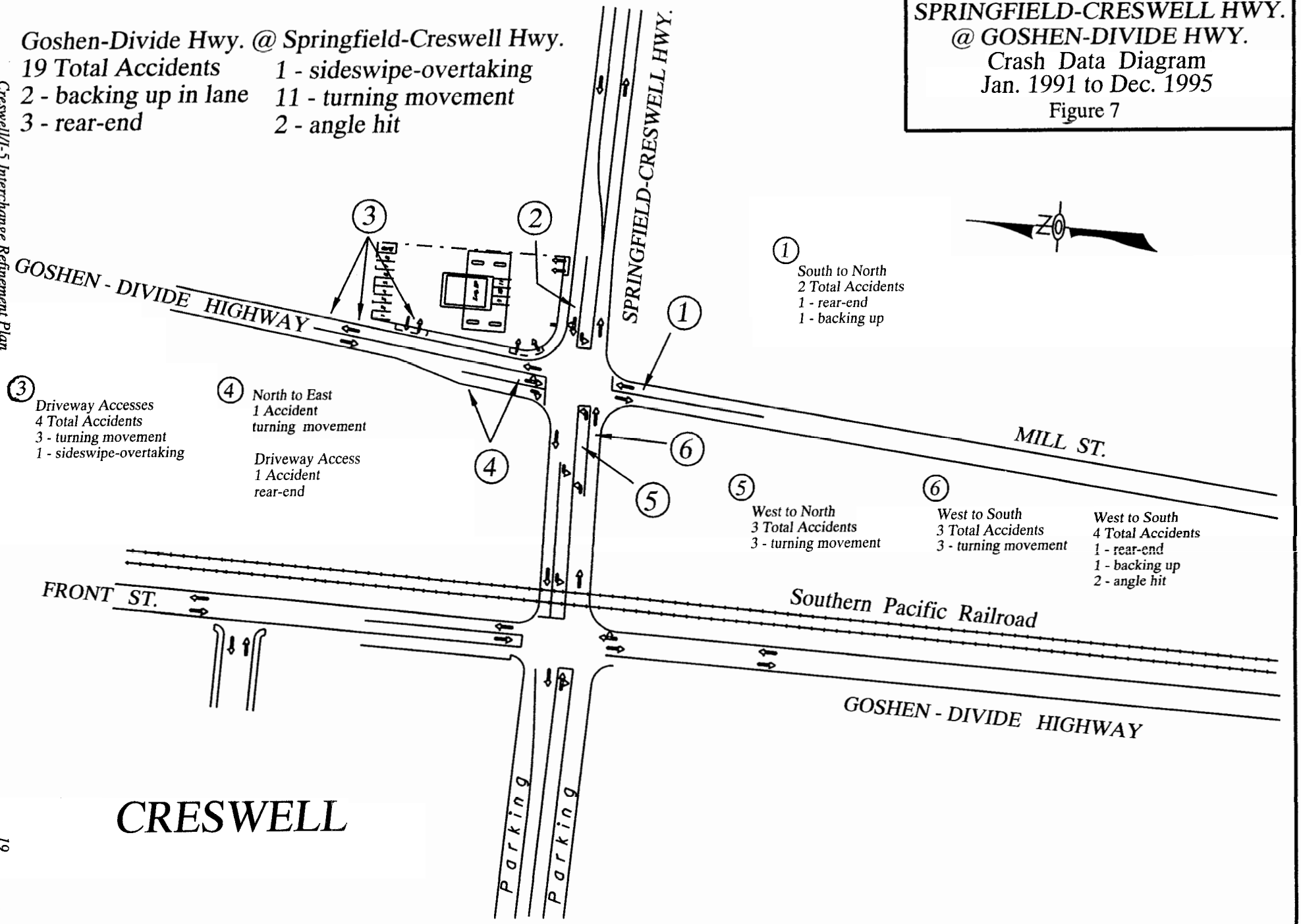
Crash Data Diagram
Jan. 1991 to Dec. 1995
Figure 6



SPRINGFIELD-CRESWELL HWY. @ GOSHEN-DIVIDE HWY.

Crash Data Diagram
Jan. 1991 to Dec. 1995
Figure 7

Goshen-Divide Hwy. @ Springfield-Creswell Hwy.
19 Total Accidents
2 - backing up in lane
3 - rear-end
1 - sideswipe-overtaking
11 - turning movement
2 - angle hit



Chapter 2
Land Use and Environmental Inventory/Conditions

Land Uses and Community Profile

Creswell was settled in the 1850s and was incorporated in 1909. At the time it was incorporated, Creswell was a farming goods producing town and area. There are now about 3,200 residents in Creswell and about 700 people living just outside the urban growth boundary (UGB). From 1980 to 1995 the average annual growth rate was 2.6 percent. About nine out of ten residents moved to Creswell from somewhere else.

The major businesses are the Fircrest Farms (largest manufacturer of Oregon-grown chicken) and the Bald Knob Land & Timber Co. In 1994 there were about 970 jobs in the area; about 75 percent of workers commute out of Creswell for employment.

There are 787 (64%) single-family homes, 194 (16%) manufactured homes in parks, 181 (15%) multi-family homes, and 57 (5%) duplexes. A higher percentage of people live in poverty in Creswell than in Lane County or the state. Median household income is 17% lower than in Lane County as a whole and nearly 23% lower than the state average. Educational attainment levels are lower than in the county or state. Eight percent of City residents have a Bachelor's degree or higher, as compared to 22% for the county and 21% for the state. Roughly 13% fewer residents have high school diplomas than in the county or the state.

Five comprehensive plan designations encompass the UGB: Residential, Commercial, Industrial, Park/Recreation/Open Spaces, and Public Facilities/Government (See Figure 8). There is also a Resort Commercial Overlay Zone. Commercial and Industrial designations surround the interchange and current land use directly around the interchange ramps is primarily highway oriented. East of the interchange, the Commercial designation has the Resort Overlay Zone. The downtown is located to the west of the interchange. There, the designations are Residential and Commercial, although the businesses and shops are smaller and laid out in a more traditional grid street system.

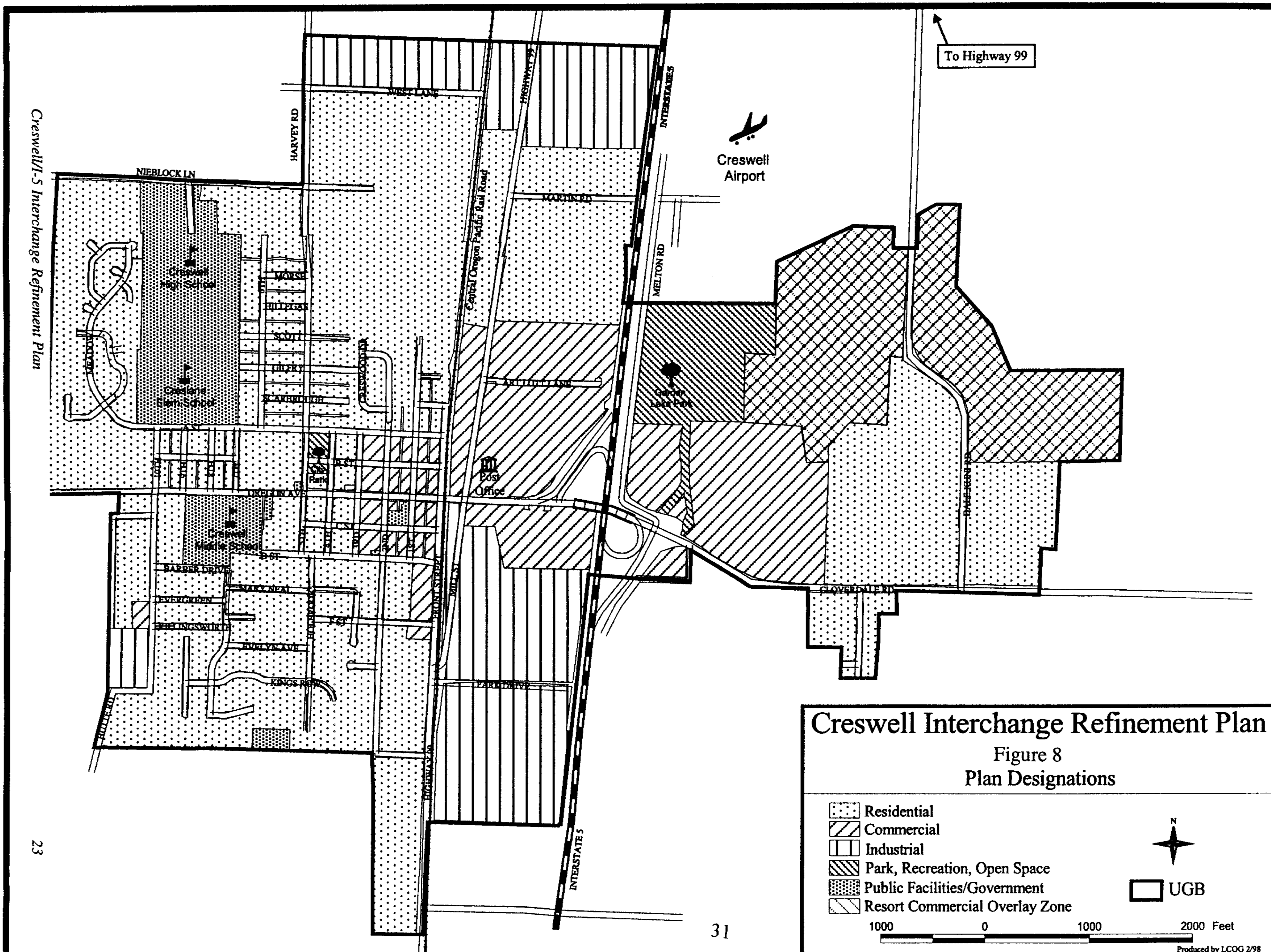
There are large vacant Commercial parcels to the east of the interchange. This area was bought by development interests and is being planned for a mixture of housing and commercial uses. It is unknown at this time what type, scale, or density of commercial uses will be located in these parcels. The developers are conducting a traffic impact study.

Environmental Conditions

A general environmental assessment was conducted by the Oregon Department of Transportation (ODOT) Environmental Section (See Figure 9). The analysis was

intended to provide a rough overview of the area around the interchange. Natural and built environments were reviewed for critical habitat and potential *show stoppers*. There were no environmental issues at this time that constitute a significant problem for future interchange designs. One area is labeled a 4f site (culturally significant), at Garden Lake Park. None of the design concepts or the preferred alternative is near this park and water source.

The environmental issues raised by ODOT, but for which there is a high likelihood for mitigation, are around the streams at the interchange. These wetland areas appear to be marginal but, by law, must try to be avoided, minimized in any design, and mitigated if there is no way to avoid the wetlands. Although not determined by the initial field survey, the wetland areas at the interchange should be analyzed for Western Pond Turtles when or if a project is funded.



Creswell Interchange Refinement Plan

Figure 8

Plan Designations

CRESWELL INTERCHANGE REFINEMENT PLAN

POSSIBLE ENVIRONMENTAL CONSTRAINTS

Prepared by
THE OREGON DEPT. of TRANSPORTATION
Project Support Section
Preliminary Design Unit, Salem

1997

Figure 9

DRAWING NOT TO SCALE

4TH STREET
3RD STREET
2ND STREET
1ST STREET
'D' AVENUE
'C' AVENUE
'B' AVENUE
'A' AVENUE
'F' AVENUE
OREGON AVENUE
NIEBLOCK LANE
GOSHEN - DIVIDE HIGHWAY
MILL ST.
SOUTHERN PACIFIC RAILROAD
GOSHEN - DIVIDE HIGHWAY
ART-LOTT LANE
PACIFIC HIGHWAY (I-5)
MELTON ROAD
SPRINGFIELD - CRESWELL HWY.
GARDEN LAKE PARK

LEGEND

- GAS STATIONS
- WETLANDS
- 4F SITE
- POTENTIAL HAZMAT SITE
- POSSIBLE WETLANDS

Chapter 3
Transportation Issues and Problems

Oregon Department of Transportation, Creswell Citizen Advisory, and Public Response

The Creswell Interchange is a facility that was constructed over 30 years ago and has served its purpose very well for the rural and regional interstate traffic for which it was designed. Over time, new state and federal policies about transportation planning for all modes of travel, and a growing population throughout the state, Lane County, and the City of Creswell initiate the need to plan for an upgrade of the interchange.

Oregon Department of Transportation (ODOT) staff initiated a list of issues and problems and presented them to the Citizen Advisory Committee (CAC). The CAC reviewed and commented on the list and it was forwarded as presentation material for an Open House with the public to review and comment. After the Open House, the issues list was expanded and again reviewed by the CAC and ODOT.

Below is a comprehensive list of issues and problems identified by the CAC, ODOT, and the public.

Design and Geometry

Sight Distance

Sight distances at ramp terminals are at minimum tolerable levels.

- ⇨ The view motorists have of oncoming vehicles from the ramp terminals is poor. Given the posted speeds in the interchange area, the line of sight distance for motorists is at or slightly below the desired distance.
- ⇨ Trees, brush, signing, guard rail, and the vertical curve over I-5 restrict the motorist's line of sight at the ramp terminals. Even though some of this is not in the direct line of sight, it is very distracting to motorists, particularly those who are unfamiliar with the area.

Grades

Springfield-Creswell Highway approaches I-5 on the west side at +5.2% and +4.9% on the east side of I-5. Grades in this range can be responsible for:

- ⇨ Slow acceleration speeds for trucks turning west from the northbound exit ramp terminal. These very low speeds can potentially cause the northbound ramp to back-up—especially during peak hours and under heavy truck volumes on the ramp. The low speeds can also force through-traffic on

Springfield-Creswell Highway to abruptly slow down or even stop to allow the truck to complete the turn from the terminal.

- ⇨ The grade limits the line of sight for motorist waiting to make turns from the ramp terminals. By limiting the line of sight, motorists are more apt to hurry or misjudge turning movements. For large trucks, they must crawl up the grade as they turn, slowing down or delaying trailing vehicles.
- ⇨ Discomfort for motorists driving through the interchange at the posted speed. The grade change, given the posted speed, is not what motorists expect to see. The roller coaster effect creates for an uncomfortable ride and may be distracting to the unfamiliar driver.

Bridge on Springfield-Creswell Highway

The bridge on Springfield-Creswell Highway that crosses I-5 is very narrow.

- ⇨ The narrow width of the bridge restricts the visibility of motorists at the ramp terminals. In addition, traffic on the Springfield-Creswell Highway may feel restricted by the narrow width on the bridge, especially if they cross the bridge at the same time as an opposing truck.
- ⇨ The narrow width does not encourage pedestrian and bicycle use. Cyclists will not ride along the shoulder because the narrow width does not provide a safe location to ride. As their only route, cyclists and pedestrians must traverse the bridge within the one-foot shoulder or along the narrow concrete *sidewalk.*
- ⇨ The shoulders on the bridge are narrow. Shoulders are meant to provide a buffer, or *correction zone*, for motorists. When provided with ample shoulder width, a driver is more relaxed as they pass through complex, high speed, or high volume intersections.
- ⇨ A new bridge would provide a center turn lane, two through lanes in each direction, wider shoulders, and sidewalks.

A redesign of the interchange must take into account the character of the traffic in the Creswell area.

- ⇨ The existing interchange has served its original intended purpose well. However, redesign of the interchange may require a different configuration to accommodate anticipated needs.
- ⇨ Traffic patterns change with time. Employment centers and services change the travel patterns at interchanges. With potential for development around the interchange, travel patterns will continue to change.

Traffic Backup on the Southbound Off-Ramp

The southbound off-ramp occasionally backs up to I-5. The back-up is known to have occurred, on occasion, during peak hours of operation. A number of factors have been contributed to this delay:

- ⇨ The free-right movement from the ramp to westbound Oregon Avenue is a sharp curve and has a poor line of sight.
- ⇨ The lane from the ramp merges instantly with the through-lane on Oregon Avenue and forces the ramp traffic to yield to the through traffic.
- ⇨ A small amount of large trucks during the peak hours can affect the overall operation of the interchange.
- ⇨ The ramp volumes have steadily increased since 1990 (+5.2%).

Access

The location and number of access points along the Springfield-Creswell Highway/Oregon Avenue create safety and operational problems.

- ⇨ Motorists must try to recognize and react to too great a variety of activities at the interchange and may become confused, which in turn may cause accidents.
- ⇨ The access points or driveways near the southbound ramp on Oregon Avenue cause conflicts with interchange traffic.
- ⇨ The driveways along Oregon Avenue may cause problems in the future because traffic may back up to the interchange ramps.
- ⇨ Melton Road east of the interchange is too close to the ramp and does not met state and federal design standards.

Trucks

The interchange area attracts a significant number of trucks.

- ⇨ Trucks are bigger than ever before, require more room to turn, park, start, and stop.
- ⇨ Truck drivers are in the business of transporting goods in the most expedient way. Time lost is money lost; the interchange is not well suited for the larger trucks and higher volume of these vehicles.
- ⇨ The design of the interchange must accommodate the turning movements of large trucks.
- ⇨ An access management plan that accommodates the turning movements and access locations for trucks should be considered.
- ⇨ The grades of Springfield-Creswell Highway/Oregon Avenue and interchange ramps make it difficult for trucks to turn and accelerate.

Growth

Existing vacant parcels will have impacts.

- ⇨ There are significant amounts of vacant commercial lands near the interchange on the east side.
- ⇨ There is no fixed public transit service for Creswell.
- ⇨ No Transportation Demand Management program exists.
- ⇨ The interchange will continue to serve the large amounts of commuter traffic, but funding for interchange improvements is limited.

Funding

Is there funding for an interchange preferred concept.

- ⇨ There are many needs in the state and Region 2 (Willamette Valley).
- ⇨ Is the interchange preferred alternative cost effective given the population?

Chapter 4
Transportation Forecasts

Methodology

Future year traffic projections are typically performed through the use of cumulative analysis, historical growth trends, or transportation models. The method used in an area depends on the type and availability of information. At the time of this analysis the best available information was a Lane Council of Governments' (LCOG) transportation model of the City of Creswell, historical growth trends on the freeway, and Lane County zoning information.

LCOG developed an EMME/2 transportation model for the City. The model uses population and employment information within the Creswell urban growth boundary (UGB) and Lane County to determine base (1995) and future (2015) Average Daily Traffic volumes. Future traffic volumes within the model area were developed using LCOG's EMME/2 model of Creswell and methodologies consistent with accepted traffic analysis guidelines. This model was used in conjunction with traffic counts by Lane County and the Oregon Department of Transportation (ODOT) at and near the interchange. Current year model numbers were calibrated using recent count data.

Land Use

The following information was taken from the draft Creswell Transportation System Plan (TSP) for consistency between the TSP and the Interchange Refinement Plan.

Population and Employment

As part of the TSP for the Creswell UGB, projections of housing units were created for 2015. These housing units are used in the transportation modeling process to identify the traffic counts and patterns associated with residential development for the 20-year planning period.

In addition, projections of employment were created for 2015. These projections are used in the transportation modeling process to verify trip rates and travel patterns associated with commercial and industrial development.

Population Projections

To develop 2015 projected housing units for the Creswell UGB, various assumptions about population growth and residential development were necessary. Below is a description of these assumptions.

Population

In 1990, the population inside the UGB was estimated at 3,130. Approximately 700 persons were residing outside the city limits inside the UGB. Population in the Creswell UGB is projected to reach 5,400 persons by 2015. This assumes an annual average growth rate of 2.6 percent for the city population. This rate is similar to the 2.6 annual average rate that occurred during the 1980 to 1995 time period. It also assumes that approximately 100 additional units will be built inside the UGB and outside the city limits.

Number of Households

To determine the number of households requiring housing in 2015, the population is divided by an assumed average persons per household. Average household size has been declining both nationally and locally over the past 30 years and is expected to continue to decline but more gradually. Based on decennial census data, average household size did decline in Creswell between 1970 and 1980 from 2.86 to 2.63; however, during the 1980s, it rose to 2.68. Consequently, the 1990 average household size figure of 2.68 will be assumed. Subtracting the assumed group quarters population of 60 and applying this average household size results in a total of 1,993 households inside the UGB in 2015. In 1990, there were 886 households within the city limits.

Number and Types of Housing Units

Determining the number of housing units needed in 2015 requires assumptions about the percentage of housing units by housing type. In addition, to ensure a healthy housing market, a 2 percent vacancy rate was assumed for owner units and a 5 percent vacancy rate for renter units. The assumption regarding the owner/renter split by housing type was taken from the 1990 Census.

To develop an assumption on the percentage of housing units by housing type, the Lane County geographic information system, the existing Creswell Comprehensive Plan, and local input were reviewed. All sources indicated that over half of the housing in the Creswell UGB will be single-family, detached units. Based on these assumptions, a total of 2,058 housing units are projected.

Table 3: Creswell Housing Units Projections

Housing Type	Percentage of Units		Number of Units		
	1996	2015	1996	2015	New Units
Single-family, detached*	***64***	***62***	***787***	***1276***	***489***
Multi-family	15	15	181	309	128
Duplex	5	5	57	103	46
Manufactured Dwelling in parks	16	18	194	370	176
Total	**100**	**100**	**1219**	**2058**	**839**

*Includes manufactured dwellings on individual lots.

A total of 2,058 housing units are projected in the Creswell UGB by 2015. This represents an increase of 839 units between 1996 and 2015.

Employment Projections

The 2015 employment projections for the Creswell UGB area are largely based on employment projections for Lane County. The County projection was used to develop a projection for Census Tract 11 in which Creswell resides. The Census Tract projection was then used to estimate a projection for the Creswell UGB area. This methodology was selected because more reliable historical data are available for Census Tract 11 than for the Creswell UGB.

The Data

Annual historical employment data for Lane County, provided by the Oregon Employment Division was used for this analysis. Biannual historical employment data from 1978-1994 for Census Tract 11 were also used. Although total employment in the Creswell UGB is known for 1994, it is not available for any other year.

The Census Tract Projection

The historical data for Lane County and Census Tract 11 were used to develop a trend for Census Tract 11 employment as a percentage of Lane County employment. The extension of the 1978-1994 trend was used along with the Lane County employment projection for 2015 to arrive at a 2015 projection for the Census Tract.

Table 4: Lane County Employment Projections

Employment by Area Geographic Area	1994	2015	Total New Employment	1994-2015 Average Growth Rate
Lane County	*125,900*	*177,074*		*1.6%*
Census Tract 11	*1,540*	*2,294*	*754*	*1.9%*

Creswell UGB Existing Conditions

In 1994, employment in the Creswell UGB area comprised 63 percent of the total employment in Census Tract 11. If it is assumed that employment growth will occur as rapidly outside the UGB as it does inside the UGB, employment will continue to be 63 percent of census tract employment. This would mean total employment in the UGB area would be 1,450 in the year 2015.

The Creswell UGB Area Projection

Because of Oregon planning rules, most of the growth in employment in the Creswell area should occur inside the UGB. Therefore, Creswell UGB employment should increase as a percentage of total employment in Census Tract 11. As a result, in 2015 Creswell UGB employment should be more than 63 percent of Census Tract 11 employment.

If all of the employment growth projected to occur in the Census Tract takes place inside the Creswell UGB (no growth outside the UGB), the projection for the UGB area would be 1,726. This would mean an increase in employment in Creswell's UGB by 754 employees over the 21-year period, or 35 employees per year on average.

Table 5: Creswell Employment Projections

Employment by Area Geographic Area	1994	2015	New Employment	UGB % of CT	1994 – 2015 Average Growth Rate
Creswell UGB – (even growth)	972	1,450	478	63%	2.5%
Creswell UGB -- (all growth)	972	1,726	754	87%	2.8%

It is reasonable to expect that there will be some increase in employment outside of the UGB because businesses located there may grow. However, to be consistent with planning guidelines, the UGB area should be able to accommodate

most new employment expected to locate in the Census Tract because it is the only city in the area.

For comparison, Creswell's Comprehensive Plan contains an employment goal to have 40 jobs for every 100 residents. If Creswell's population reaches about 5,400 persons by 2015 as projected, there would be a total of 2,160 jobs or about 434 more than projected above.

Traffic Forecast

Traffic forecasts were conducted and analyzed by ODOT. Level of Service (LOS) and signal warrants for signalized and unsignalized intersections were used to determine future year impacts. The EMME/2 model provided the initial future traffic output, which was then analyzed using LOS and signal warrant methods.

LOS for the ramp terminals and intersections along Oregon Avenue (Springfield-Creswell) were analyzed using SIGCAP2, the ODOT computerized analysis program that is based on critical movement analysis. The signalized intersection LOS is a quantitative measure of the ratio between the existing or projected volumes, to the capacity of the roadway at a given location. This ratio is known as volume to capacity (V/C). The V/C ratios are broken down into six levels and each is given a letter designation, from A through F, for identification purposes. The LOS designation of A represents the best LOS while F represents the worst. See Appendix D for signalized LOS designation.

The storage lengths required at the signalized intersections are provided by SIGCAP2. The storage distance is an estimation of the queue of vehicles stopped at a signalized intersection during the *red* phase. This distance is of great importance because it will show the interaction between the signal and other intersections or driveways in the vicinity.

The peak hour volumes at unsignalized intersections were analyzed using UNSIG10. This ODOT program uses reserve capacity of a lane to determine a LOS. The reserve capacity is equal to the capacity of a lane at an unsignalized intersection minus the demand volume for that lane. The reserve capacities are broken into six levels and each is given a letter designation, form A through F, for identification purposes. The LOS designation A represents the best while F is the worst. These LOS only apply to traffic flows that must either stop or yield at an unsignalized intersection. Left turns from a main street and all side-street traffic are effected. The through traffic on the main street is generally unaffected, until the other movements approach capacity and create a safety concern.

As stated earlier, ODOT uses Signal Warrant 1 (Minimum Vehicular Traffic) and Warrant 2 (Interruption of Continuous Traffic) from the *Manual on Uniform Traffic Control Devices* (MUTCD) for a preliminary signal warrant analysis. These warrants deal primarily with high volumes on the intersecting minor street, as well as high volumes

on the major street. Meeting preliminary signal warrants does not guarantee that a signal will be installed. Before a signal can be installed, a field warrant analysis will be conducted by ODOT. If warrants are met, the ODOT Traffic Management Section will make the final decision on the installation of a signal on a State Highway.

Transportation Demand Management

It is difficult to forecast transportation demand management (TDM) for this interchange area. The potential for certain demand management techniques may exist in the east side areas of the interchange or the vacant commercial parcels. Currently, there are no formal TDM techniques in operation, although a transit survey in the community indicated that about 7 percent of the residents carpool to work.

Transit

In 1995, Lane Transit District (LTD) and the cities of Creswell and Cottage Grove jointly funded a transportation needs assessment. The purpose of the needs assessment was to determine whether Creswell and Cottage Grove residents were interested in public bus service, measure whether there was support for bus service, and whether residents were willing to finance bus service.

A total of 100 surveys were completed in Creswell. Eighty-seven percent of the respondents who work outside their home, also work outside Creswell, mostly in the Eugene-Springfield area. Ninety-four percent of the respondents use a car to get to work and 7 percent carpool. Seventy-nine percent of the respondents shop outside Creswell at least once a week.

Forty-six percent of Creswell survey respondents rated public transportation to Eugene/Springfield as Extremely Important and only 17 percent rated it as Not at All Important. Forty-three percent of the respondents said they were Very Willing or Somewhat Willing to ride a bus to Eugene/Springfield and pay a one-way fare of $.80. Thirty-seven percent of the respondents said they were Not Willing at All or Somewhat Not Willing to ride the bus and pay $.80.

Chapter 5
Concepts and Preferred Alternative

Outline

Design concepts are the first level of facility planning and design. Concepts are not final designs nor are they automatically included in the Statewide Transportation Improvement Program (STIP). The purpose of design concepts is to reasonably create and evaluate a host of ideas for the facility for the long term. A team of Oregon Department of Transportation (ODOT) planners and engineers were responsible for directly creating these concepts, while the Creswell Citizen Advisory Committee (CAC), Creswell citizens, and Lane County Public Works staff reviewed the concepts and provided instrumental revisions, evaluation, and responses.

A process for creating the design concepts was initiated by ODOT and approved by the Creswell CAC. The first step in this process was to create a function and role statement about the interchange using existing state and federal policies while incorporating local and regional uses and perceptions. Secondly, a methodology was created by ODOT and the CAC to guide the formation and evaluation of the concepts. Explanations and rationale are provided about why certain concepts were not forwarded.

Function and Role of the Interchange

It is important to establish the role and desired function of the interchange before stating the design goal and objectives for the Refinement Plan. There are state-wide design standards and policies for interchanges along Interstate 5. These standards and policies act as a guide when formulating goals, objectives, and criteria during the alternatives phase of the Refinement Plan. The Oregon Transportation Plan, Oregon Highway Plan, and the Willamette Valley Strategy contain broad policies regarding interchanges along Interstate-5. The Federal Highway Administration also has developed specific policies concerning the creation of new interchanges and modification of existing interchanges along the interstate system. ODOT also relies on the Highway Design Manual and a draft discussion paper *Interchange Access Management Policy*. In addition, the Oregon Transportation Commission also has a policy that outlines interchange placement and spacing. Existing features such as local land uses, topography, street patterns, and traffic volumes also influence the goal, objectives, and criteria.

The primary purpose for interchanges along Interstate 5 is to provide access between the highest Level of Importance (LOI) roadway (I-5) and communities and state-wide or regional LOI transportation corridors. This access must also be designed for the highest level of safety and mobility. Traffic using the interchange should be regional in nature and local trips should be encouraged to use the local street system, transit, or other alternatives. Interchanges should tie into significant local street systems that serve a large

area and not merely a specific neighborhood or land use. There should be a local and regional road hierarchy developed that routes traffic from smaller transportation systems to larger systems. Intersections and accesses near the interchange ramp terminals need to be highly regulated to ensure an acceptable Level of Service through the interchange area. Local streets, therefore, should be spaced at safe and efficient distances from the interchange ramp terminals. A plan to redesign the interchange should be managed for the life of the investment.

Land uses around interchanges may significantly impact operations and safety. Therefore, local governments must plan and implement land use patterns that protect and are consistent with the operation of the interchange, and provide options for people to use other modes of travel or choose to travel along local streets. The interchange must also serve the needs of pedestrians, bicycles, and transit.

The Creswell interchange is a significant transportation facility for the city and surrounding area, influencing local traffic patterns, especially along Oregon Avenue (Springfield/Creswell Highway) and Cloverdale Road (Springfield/Creswell Highway). For instance, driveways along Oregon Avenue (Springfield/Creswell Highway) significantly influence the operations of the interchange ramp terminals. Also, a relatively large portion of vacant commercial land on the east side of the interchange will, when developed, impact the interchange. Consequently, it is important to develop an access management plan with the City of Creswell and local property owners that places driveways and local streets a safe distance from the interchange ramp terminals.

The role and function of this interchange should follow closely the policies and standards for Interstate 5 interchanges in the Willamette Valley. Every effort should be made to coordinate with the City in its Transportation System Plan (TSP) to provide a safe and efficient transportation system for all modes of travel while designing a rational street pattern serving property near the interchange. Any interchange alternative chosen by the City and ODOT is linked to the outcome of the Creswell TSP.

Project Goal

Improve the safety and operation of the interchange and the surrounding state highway transportation arterial system while maintaining the system hierarchy of interstates, state roads, collectors, and local streets.

Objectives (not in order of importance)

1. Conforms with ODOT policies and performance guidelines in the Transportation Planning Rule (TPR), the Oregon Highway Plan (OHP), and the Oregon Transportation Plan (OTP).

2. Coordinate the alternative with the goals and policies of the Creswell Transportation System Plan.

3. Create an alternative that achieves the aesthetic goals for maintaining the historic scale and pattern of Creswell.

4. Develop a multi-modal alternative that optimizes safety and mobility while providing reasonable access.

5. Create an alternative that is fiscally constrained and built in phases.

6. Coordinate with the Creswell TSP to develop an access management plan for the Springfield-Creswell Highway that resembles the features listed under Access Management Category #5 in the OHP.

7. Optimize the safety and operation of the Creswell Interchange at I-5 through the design of the interchange elements and through access control measures around the interchange.

8. Investigate possible solutions at the Highway 99/Oregon Avenue intersection.

Design Criteria

1. Achieve Level of Service (LOS) B on Mainline (I-5), LOS C for ramp merges and diverges on I-5, LOS C for ramp terminals, and LOS D along the Springfield Creswell Highway. LOS are for a 2015 design year.

2. Project should be built in phases that could be funded.

3. Concept should accommodate all users of facility (trucks, autos, transit, bikes, pedestrians).

4. Full build-out of the interchange should incorporate the construction of a new structure.

5. Avoid significant environmental impacts.

Design Concepts

Traffic Analysis Assumptions for the Concepts

Future Traffic

Future year traffic projections are typically performed through the use of cumulative analysis, historical growth trends, or transportation models. The method used in an area depends on the type and availability of information. At the time of this analysis, the best available information was a transportation model of the City of Creswell, historical growth trends on the freeway, and Lane County zoning information.

Lane Council of Governments (LCOG) has developed an EMME/2 transportation model for the City of Creswell. The model uses population and employment information within the Creswell urban growth boundary (UGB) and Lane County to determine base (1996) and future (2015) Average Daily Traffic (ADT) volumes. Future traffic volumes within the model area were developed using LCOG's EMME/2 model of Creswell and methodologies consistent with National Cooperative Highway Research Project Report 255.

Future Local Street Connections

The TSP for the City of Creswell extends Kings Row and extends either West Lane or Nieblock Lane easterly to Goshen-Divide Highway. The initial EMME/2 transportation model for the City did not include the future extensions of West Lane, Nieblock Lane, and Kings Row easterly to Goshen-Divide Highway. For that reason, the EMME/2 transportation model for the City was revised to include the effects of the proposed extensions. In September 1997, Lane County staff indicated that either West Lane or Nieblock Lane may be extended easterly to Goshen-Divide Highway.

The effect of the proposed extensions does not change the projected traffic volumes on the portion of Oregon Avenue that is located between Mill Street and the Creswell/I-5 Interchange. In the year 2015, the effects of these extensions will lower traffic volumes on the portion of Oregon Avenue located west of Front Street by approximately a third. The northern portion of Goshen-Divide Highway will grow by approximately 9 percent while the southern portion will be reduced by approximately 15 percent.

Preliminary signal warrants

Preliminary ADT Traffic Signal Warrants were met at both northbound and southbound freeway ramp terminals before the design year 2015. Table 6 shows both the intersection and the approximate year projected for meeting the signal warrant.

Table 6: 1996 and 2015 Signal Warrants

Intersection	Warrant 1			Warrant 2		
	1996	2015	Year Met	1996	2015	Year Met
Northbound Ramp Terminal at Springfield-Creswell Highway	No	No	----	No	Yes*	2013
Southbound Ramp Terminal at Oregon Avenue	No	Yes*	1999	No	Yes*	2011

*Meeting a preliminary signal warrant is *not* a mandate to install a signal. It is a guideline to alert staff to the possibility of a signal being needed at a certain location.

- Warrant 1 deals primarily with high volumes on the intersecting minor-street.
- Warrant 2 analyzes high volumes on the major street and the delays and hazards to vehicles on the minor street trying to either access or cross the major street.

Storage Distance

The storage distance for a signalized intersection is the distance that vehicles *back-up* while waiting for the traffic signal to turn green. Adequate storage distances are very important when it comes to the operation of a transportation system. If vehicles *back-up* past other intersections, drivers will experience excessive delay while waiting to turn onto the main roadway because the intersection will be blocked.

To ensure adequate storage and proper operation of the transportation system, the closest unsignalized intersection should be located approximately 150 meters (500 feet) from the freeway ramp terminals. The closest signal should be located approximately 400 meters (1/4 mile) from the freeway ramp terminals. The distance of 400 meters is needed to progress traffic flows between traffic signals at acceptable levels. Consequently, the storage distance analysis is an important determinant in the evaluation of the interchange concepts.

Storage distance requirements for both the northbound and southbound freeway ramp terminals are the same for all build concepts (Concepts 1, 2, and 3) because the design for the proposed interchange is the same for all build concepts. These distances are tabulated for the northbound freeway ramp terminals and southbound freeway ramp terminals in Tables 7 and 8, respectively.

Table 7: Storage Distance Requirements for Northbound Freeway Ramps at Springfield-Creswell Highway (Concepts 1, 2, and 3). All distances are given in meters (feet).

Approach	Left	Through	Right	Available
South	30 (100)	0 (0)	25 (75)	(120) 400
North	0 (0)	0 (0)	0 (0)	N/A
West	0 (0)	45 (150)	0 (0)	260 (850) to Ramp Intersection
East	10 (25)	15 (50)	0 (0)	70 (225) for left turn 170 (550) for through

Table 8: Storage Distance Requirements for Southbound Freeway Ramps at Oregon Avenue (Concepts 1, 2, and 3). All distances are given in meters (feet).

Approach	Left	Through	Right	Available
South	0 (0)	0 (0)	0 (0)	N/A
North	40 (125)	40 (125)	55 (175)	70 (225)
West	0 (0)	55 (175)	55 (175)	45 (150) for left turn 150 (500) feet for through
East	15 (50)	30 (100)	0 (0)	260 (850) to Ramp Intersection

There are no problems with the storage distance requirements at either northbound or southbound freeway ramp terminals. All three build concepts will realign Melton Road at least 150 meters (500 feet) east of the northbound freeway interchange ramps. There will be approximately 485 feet of distance between the KOA Access and the southbound freeway interchange ramps. The location of this access is close enough to the 500 foot guideline so that the KOA access could remain in its existing location, but further analysis would occur during project design or implementation of this access to ensure that safety and operations of the southbound ramp are met.

Policy Assumptions for Each Concept

It is very important to manage and protect an investment such as an interchange project. To ensure the ramp terminals operate at acceptable levels of service, as well as to ensure that these terminals are not congested shortly after a project is implemented, it is necessary to implement access management policies.

The management of access points (driveways and local streets) along Springfield/Creswell Highway (Oregon Avenue) is very important for the operations and safety of the interchange. In the design concepts, every effort is made to locate existing and future access points as far away as possible from the interchange ramps.

ODOT relied on access standards in the 1996 Highway Plan.

Concepts Advanced for Further Review

Concepts considered but not advanced are found in Appendix E.

- No Build
- Concept 1 (Goshen-Divide Highway: Railroad Grade Separation)
- Concept 2 (Goshen-Divide Highway: Depressed Railroad Grade Separation)
- Concept 3 (Major Re-Alignment North Goshen-Divide Highway)

Three design concepts and one no-build concept were considered. The concepts are described below according to advantages, disadvantages, traffic analysis, and why it was not chosen as the alternative. Each concept, except the no build, has the same interchange redesign. **The major differences of each idea involve realigning the Goshen-Divide Highway at Oregon Ave.**

The major problem along Oregon Avenue are the two existing intersections on Oregon Avenue that form a *jog* of Goshen-Divide Highway at the railroad. Each of the three concepts has a different method for addressing this problem.

No Build Concept

Description

This concept is the existing structure. The assumption is that no changes will occur to the interchange in the next 20 years except for minor safety improvements and maintenance.

Advantages

- Costs are kept low as opposed to rebuilding the structure.
  No additional right of way needed.
- No impacts to local streets or other access points.
  No controversy or issues with a new design.

Disadvantages

- Transportation safety for all modes will decrease.
- Interchange will not function to serve the regional and local transportation needs in the future.
- The ramp terminals will operate at an unacceptable LOS F in the future.
- Projected LOS problems at the ramp terminals will affect safety and operations of Interstate 5.

Traffic Analysis—Future Year 2015 No-Build (Figure 10)

Residential and commercial development will create increased traffic volumes in Creswell:

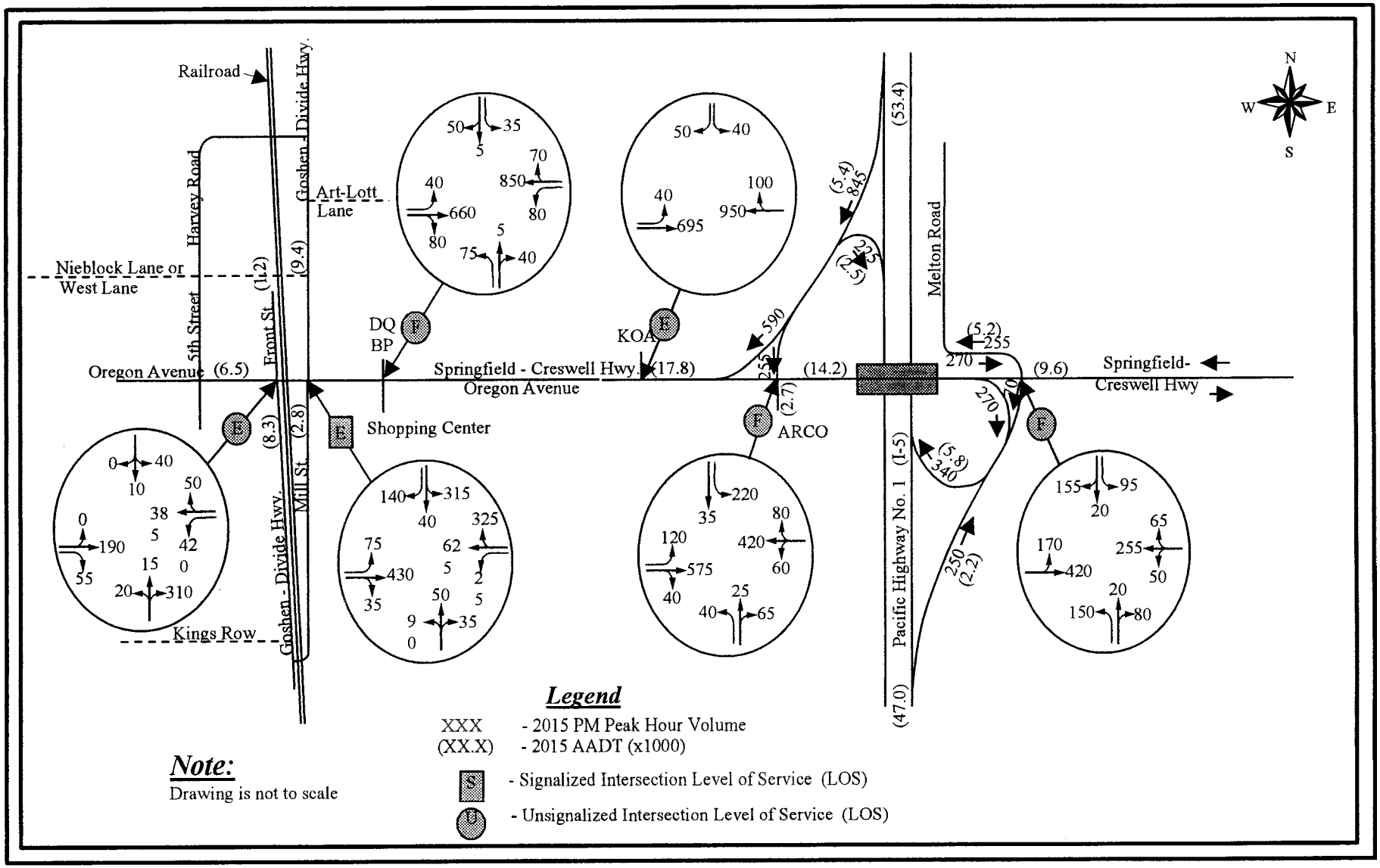
- Traffic on the portion of Oregon Avenue that is located between Goshen-Divide Highway and Creswell/I-5 Interchange will increase by approximately 58 percent between the years 1996 and 2015.
- Traffic on Oregon Avenue west of Front Street will increase by approximately 44 percent.
- The northern portion of Goshen-Divide Highway will increase by approximately 55 percent while the southern portion will increase by approximately 67 percent.
- The highest growth rate is located on Springfield-Creswell Highway just east of Creswell/I-5 Interchange. The anticipated commercial development in this area should double traffic flow volumes by the year 2015.

Table 9: Years 1996 and 2015 Levels of Service for No-Build Option—Without Future Extensions

	No-Build (Without Future Extensions)			
	Unsignalized		Signalized	
Intersection	1996	2015	1996	2015
Northbound Freeway Ramps/Melton Road at Springfield-Creswell Highway	B	F	----	----
Southbound Freeway Ramps/Arco Station Access at Oregon Avenue	C	F	----	----
KOA Access at Oregon Avenue	D	E*	----	----
BP Station/Shopping Center Accesses at Oregon Avenue	D	F	----	----
Goshen-Divide Highway/Mill Street at Oregon Avenue	----	----	C	E
Front Street/Goshen-Divide Highway at Oregon Avenue	E	F*	----	----

*The LOS shown in this table assumes that traffic queues from adjacent intersections do not cause adverse effects on intersection operation. If traffic queues from a *closely-spaced* intersection blocks the operation of the intersection that is being analyzed, the resulting LOS will probably be LOS F.

Table 10 does not include the effect of the proposed extensions of Kings Row and either West Lane or Nieblock Lane. Future traffic volumes cause four of the unsignalized intersections to drop to an unacceptable LOS F. The LOS for both northbound and southbound freeway ramp terminals could be improved by installing traffic signals; however, both of these freeway ramps are geometrically unacceptable and would have to be modified before traffic signals could be installed.



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, No Build Option - Includes TSP Extensions **2015 Design Hour Volumes**	FILE : Creswell-2.PPT	Prepared By: Harlan Nale	FIGURE 10
	DATE : 12/18/97	Reviewed By: Brian Dunn	

Table 10 compares the year 2015 LOS for the No-Build Option with and without the proposed extensions of Kings Row and either West Lane or Nieblock Lane:

Table 10: Comparing Year 2015 Levels of Service for No-Build Option With and Without Local Street Extensions

Intersection	No-Build (Year 2015)			
	Unsignalized		Signalized	
	No Ex-tensions	w/Ex-tensions	No Ex-tensions	w/Ex-tensions
Northbound Freeway Ramps/Melton Road at Springfield-Creswell Highway	F	F	----	----
Southbound Freeway Ramps/Arco Station Access at Oregon Avenue	F	F	----	----
KOA Access at Oregon Avenue	E*	E*	----	----
BP Station/Shopping Center Accesses at Oregon Avenue	F	F	----	----
Goshen-Divide Highway/Mill Street at Oregon Avenue	----	----	E	E
Front Street/Goshen-Divide Highway at Oregon Avenue	F*	E*	----	----

* The LOS shown in this table assumes that traffic queues from adjacent intersections do not cause adverse effects on intersection operation. If traffic queues from a *closely-spaced* intersection blocks the operation of the intersection that is being analyzed, the resulting LOS will probably be LOS F in lieu of the LOS that is reported in this table.

The proposed extensions will improve the unsignalized intersection of Front Street/Goshen-Divide Highway at Oregon Avenue from LOS F to LOS E. This improvement in LOS is due to the reduction of traffic flows on the portion of Oregon Avenue that is located west of Front Street.

Interstate 5 is the major roadway in this vicinity and the ramps must function properly to insure a well-operating system. Under the No-Build Option, in the year 2015, both the freeway and ramp merge and diverge points will operate at LOS D whether or not the interchange is rebuilt.

Signal Warrants at Interchange

Preliminary ADT Traffic Signal Warrants were met at both northbound and southbound freeway ramp terminals before the design year (year 2015). Table 11 shows both the intersection and the approximate year projected for meeting the signal warrant.

Table 11: 1996 and 2015 Signal Warrants for Ramp Terminals

Intersection	Warrant 1			Warrant 2		
	1996	2015	Year Met	1996	2015	Year Met
Northbound Ramp Terminal at Springfield-Creswell Highway	No	No	----	No	Yes*	2013
Southbound Ramp Terminal at Oregon Avenue	No	Yes*	1999	No	Yes*	2011

*Meeting a preliminary signal warrant is *not* a mandate to install a signal. It is a guideline to alert staff to the possibility of a signal being needed at a certain location.

Storage Distances (Figure 11)

Traffic will back up to the southbound interchange ramp terminal under a No-Build concept. It is anticipated that a LOS E will occur in 2015 with a Volume to Capacity Ratio (V/C) of .94. The lack of an adequate storage distance in the future will seriously impact the safety and operations of the interchange and Springfield-Creswell Highway (Oregon Avenue).

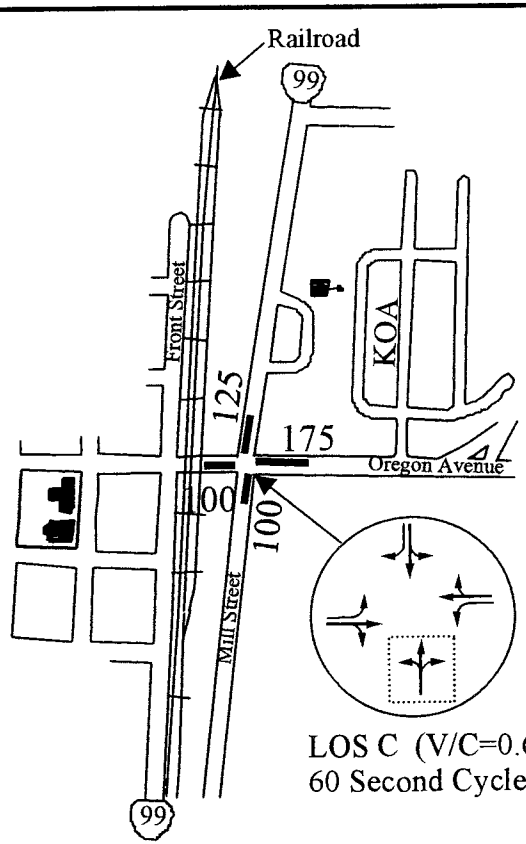
Reasons not Selected

Nothing is changed on or near the interchange; there are no major safety or operational improvements for any mode of travel. The No-Build Concept does not meet the goal, objectives, or criteria for the following reasons:

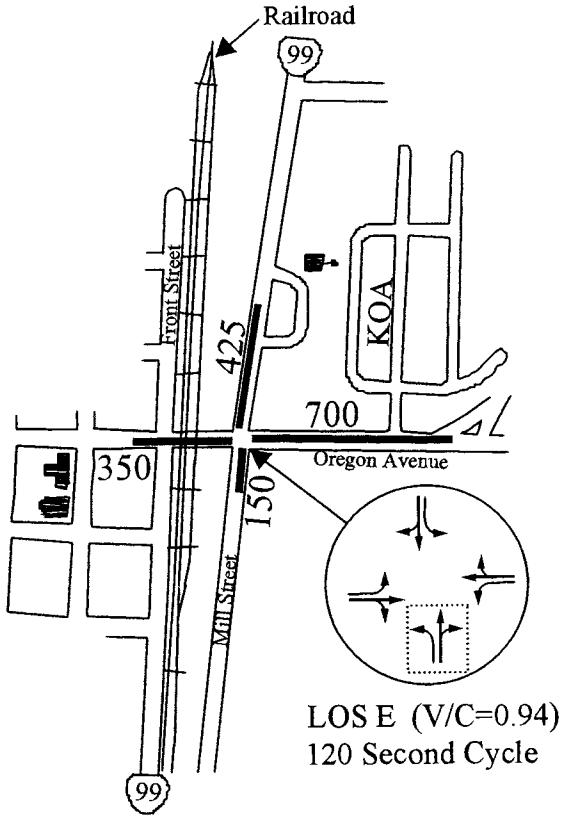
The geometry at the northbound ramp terminal and bridge crossing is not improved, thus perpetuating undesirable safety and operational conditions.

- Anticipated growth on vacant parcels and significant traffic increases along the Springfield/Creswell Highway continue to impact the southbound ramp terminal.
- The LOS standards are not met as outlined in the criteria.
- Westbound vehicles on Oregon Avenue will require a storage distance of approximately 700 feet. This distance backs onto the right turn lanes at the southbound interchange ramp.

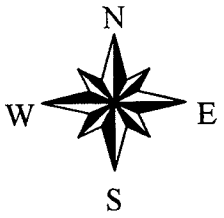
Storage distances on Oregon Avenue at the Goshen-Divide intersection east and west are not adequate for the number of vehicles in 2015, thus causing low levels of service on local side streets, safety, and operational problems.



Year 1996
Storage Distances (Feet)
(No Extensions)



Year 2015
Storage Distances (Feet)
(With Extensions)



OREGON DEPARTMENT OF TRANSPORTATION TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, No Build Option **Storage Distances for Years 1996 and 2015**	**File : Creswell~1.PPT** **Date : 11/25/97**	**Prepared By: Harlan Nale** **Reviewed By: Brian Dunn**	FIGURE 11

Concept 1 Goshen-Divide Highway Railroad Grade Separation

Description (Figures 12 and 13)

The structure is significantly improved:

- The bridge is rebuilt to modern design standards, which include widening to four lanes of traffic with shoulders;
- The profile grade is improved;
- Pedestrian, bicycle, and vehicular mobility and access is significantly improved;
- The east and west ramp terminals is redesigned;
- When necessary, a southbound entrance ramp is installed;
- Oregon Avenue is improved to a five-lane section built to urban standards.

Melton Road at the east ramp is aligned further east, at least 150 meters, away from the ramp terminal. The southbound ramp, on the west side, is also moved 70 meters further to the east from its existing location.

When warrants are met, there are traffic signals at the northbound and southbound ramp terminals, and Goshen-Divide Highway/Mill Street.

The intersection of Goshen-Divide and Oregon Avenue (Springfield-Creswell Highway) is redesigned. The primary intersection is at Goshen-Divide Highway and Mill Street.

Goshen-Divide Highway is realigned south of Oregon Avenue. A bridge is built over the railroad crossing from Mill Street to intersect with an extension of King's Row to the east. Mill Street is improved to urban standards (additional turn lanes, sidewalks, and drainage).

Median treatments are installed along Oregon Avenue from the southbound ramp terminal to Front Street.

Cost:

Local Street/Highway 99	$6.0 million
Interchange	$7.5 million
Total	$13.5 million

KINGS ROW

OREGON AVENUE

FRONT ST.

GOSHEN - DIVIDE HIGHWAY

MILL ST.

SOUTHERN PACIFIC RAILROAD

SUGGESTED LOCATION FOR LOCAL ACCESS POINT

GOSHEN - DIVIDE HIGHWAY

POST OFFICE

SUGGESTED LOCATION FOR LOCAL ACCESS POINT

MARKET ROAD

KOA

PACIFIC HIGHWAY (I-5)

MELTON ROAD

Figure 12

CONCEPT 1

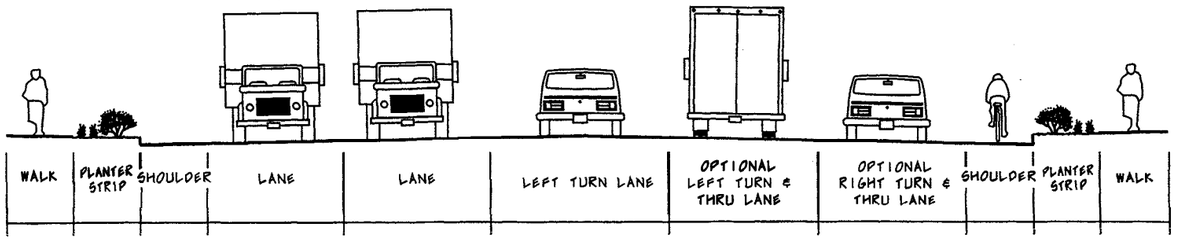
CRESWELL INTERCHANGE REFINEMENT PLAN
SEPTEMBER 30, 1997

**** Major Realignment of ****
*** S. GOSHEN-DIVIDE HWY. ***
*** Railroad Grade Separation ***

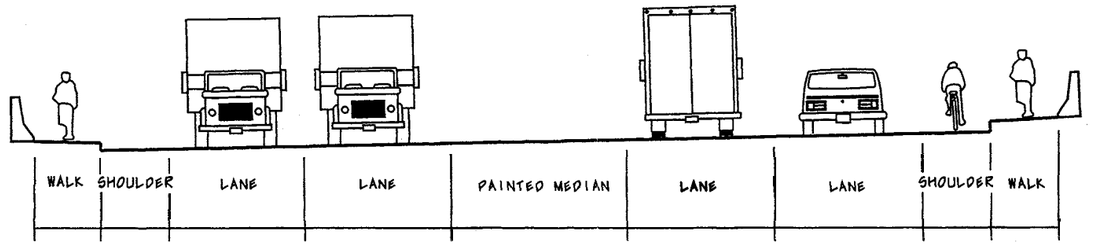
LEGEND

- Traffic Signal
- New Construction
- Right of Way Impact
- Bridge

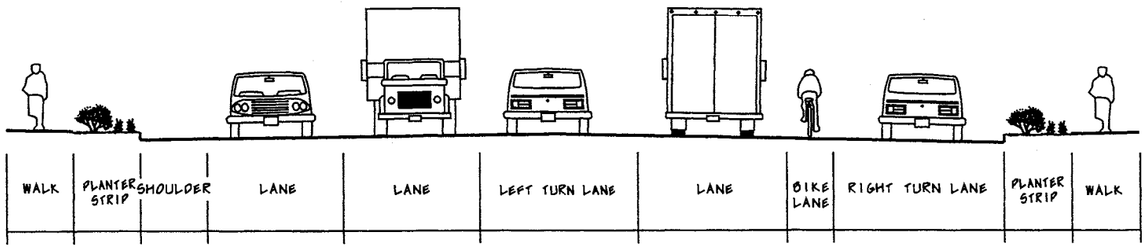
PREFERRED ALTERNATIVE



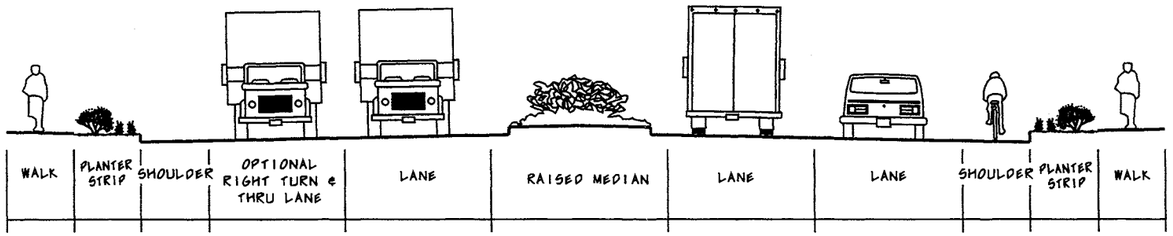
WESTBOUND OREGON AVE. @ MILL ST.



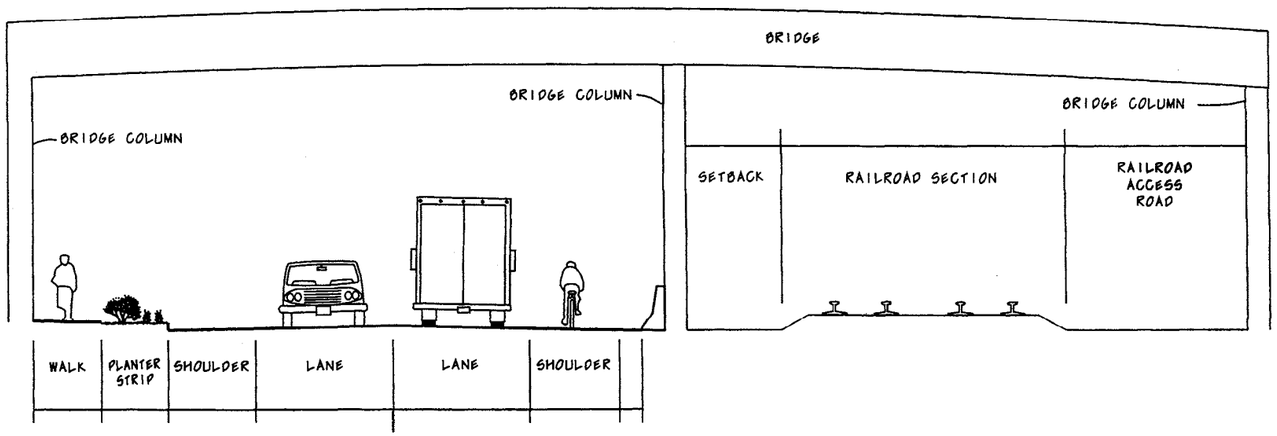
EAST END OF BRIDGE CROSSING I-5
ON SPRINGFIELD-CRESWELL HWY.



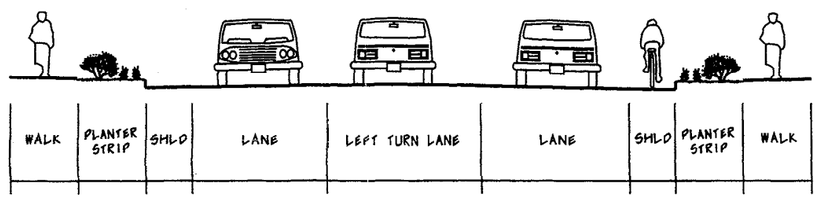
MILL ST./NEW SO. GOSHEN-DIVIDE HWY. @ OREGON AVE.



WESTBOUND OREGON AVE. @ FRONT ST./S. GOSHEN-DIVIDE HWY.



NORTHBOUND RAMP UNDER NEW S. GOSHEN-DIVIDE HWY.



KINGS ROW @ SOUTH GOSHEN-DIVIDE HWY.

Figure 13

OREGON DEPARTMENT OF TRANSPORTATION
PRELIMINARY DESIGN UNIT

CRESWELL INTCHG. REFINEMENT PLAN
S. GOSHEN-DIVIDE HWY. GRADE SEPARATION

ROADWAY TYPICAL SECTIONS

APRIL 1998 NOT TO SCALE

nt7112d /usr/projects/creswell/cres typ.dgn 4/98

Advantages:

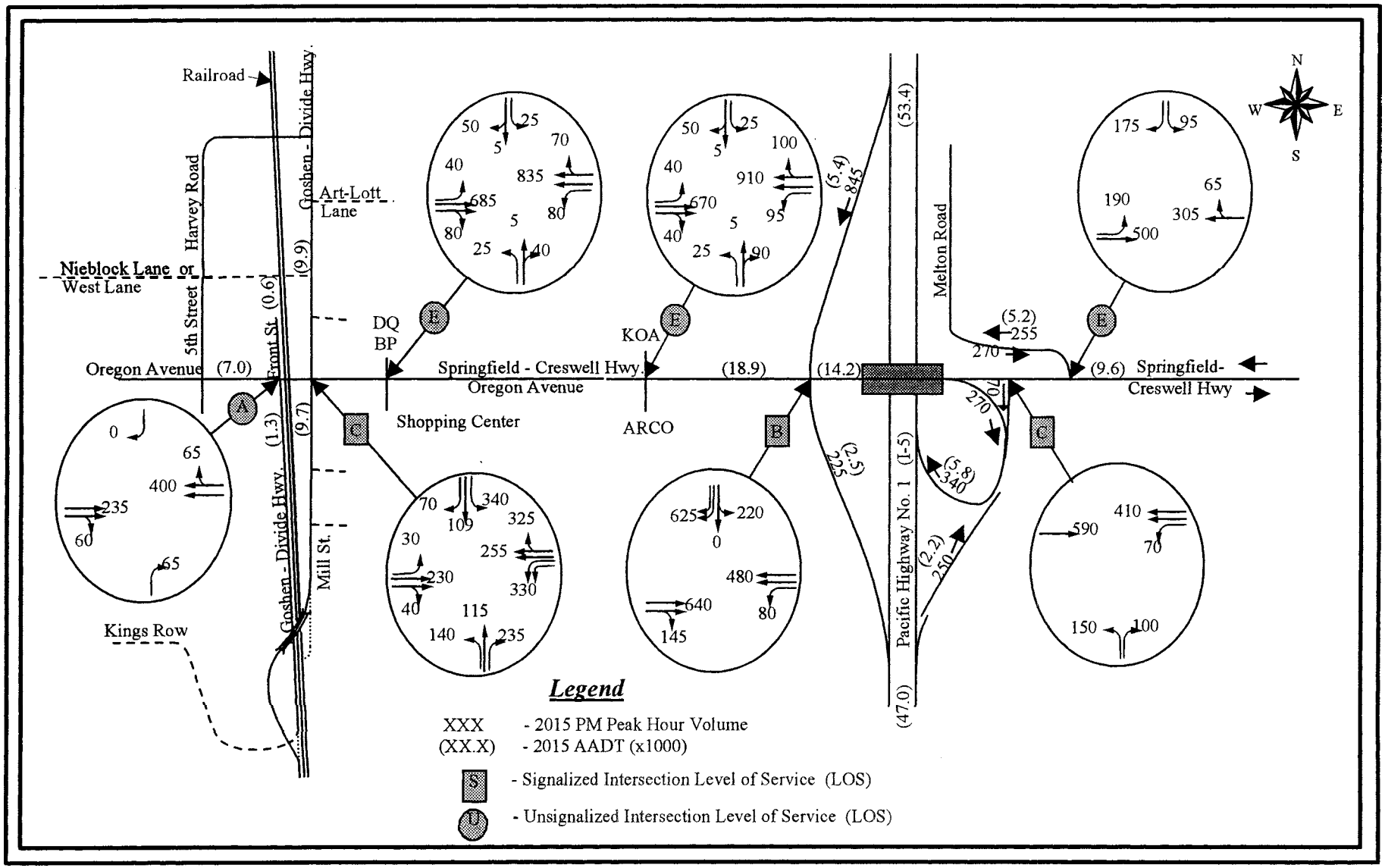
- A new/wider structure over I-5 better accommodates all transportation modes.
- Improved sight distance at the ramp terminals because of new profile grade and wider structure on the Springfield-Creswell Highway.
- Provides a through connection of the Goshen-Divide Highway from the intersection of Oregon Avenue/Mill Street to Market Road.
- Improves the roadway section along Oregon Avenue to accommodate future traffic demand.
- Reduces accident potential by removing the at-grade railroad crossing of Mill Street at the Goshen-Divide Highway.
- Maintains the north to south and complimentary directional movements along the Goshen-Divide Highway.
- Provides an acceptable LOS for all signalized intersections.
- Increases the distance from the west ramp terminal to the signalized intersection of Oregon Avenue/N. Goshen-Divide Highway.
- Maximizes the distance from the ramp terminals to the closest access point.

Disadvantages

- Does not remove the railroad at-grade crossing on Oregon Avenue.
- Significant right of way impact to existing land uses.
- High cost—structures comprise the majority of the cost.
- Removes Mill Street access from S. Goshen-Divide Highway.
- Long storage lengths on Oregon Avenue will discourage some trips to/from services during the busiest time of the day (4-6 p.m.).

Traffic Analysis

Figure 14 shows the 2015 Design Hour volumes for Concept 1. Included in this figure are the peak and daily trips with LOS for key intersections such as the ramp terminals. The southbound ramp operates at LOS B and the northbound terminal at LOS C. The worst LOS occurs at the unsignalized intersection of Melton Road and Springfield-Creswell Highway near the northbound tramp (LOS E). Also, there are two locations along Springfield-Creswell Highway (Oregon Avenue) west of the interchange that operate at LOS E.



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, Concept 1 - w/ TSP Extensions, 2015 Design Hour Volumes **Realignment of Southern Goshen -Divide Highway**	FILE : Creswell-2.PPT	Prepared By: Harlan Nale	FIGURE 14
	DATE : 11/26/97	Reviewed By: Brian Dunn	

Table 12: Year 2015 Levels of Service for Concept 1

Intersection	Unsignalized	Signalized
Melton Road at Springfield-Creswell Highway	E	----
Northbound Freeway Ramps at Springfield-Creswell Highway	----	C
Southbound Freeway Ramps/Arco Station Access at Oregon Avenue	----	B
KOA Access at Oregon Avenue	E	----
BP Station/Shopping Center Accesses at Oregon Avenue	E*	----
Realigned Goshen-Divide Highway Street at Oregon Avenue	----	C
Front Street at Oregon Avenue	A	----
Existing Southern Goshen-Divide Highway at Oregon Avenue	A	----

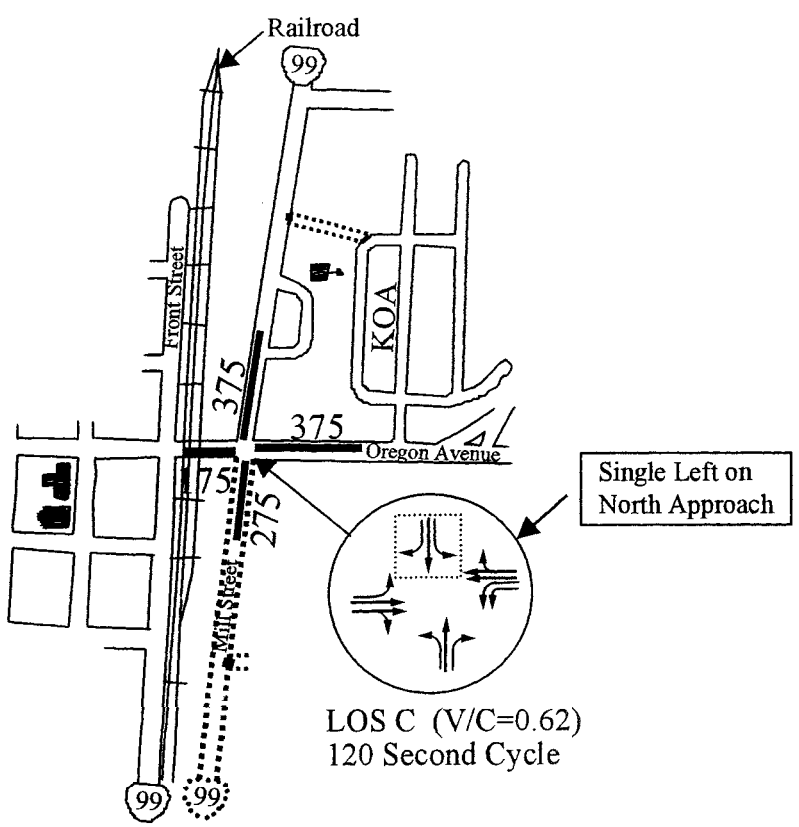
*The LOS shown in this table assumes that traffic queues from adjacent intersections do not cause adverse effects on intersection operation. If traffic queues from a *closely-spaced* intersection blocks the operation of the intersection that is being analyzed, the resulting LOS will probably be LOS F.

The proposed *four-legged* unsignalized intersection, created by extending Kings Row easterly to Goshen-Divide Highway *straight-across* from the existing realigned Southern Goshen-Divide Highway, operates at LOS C.

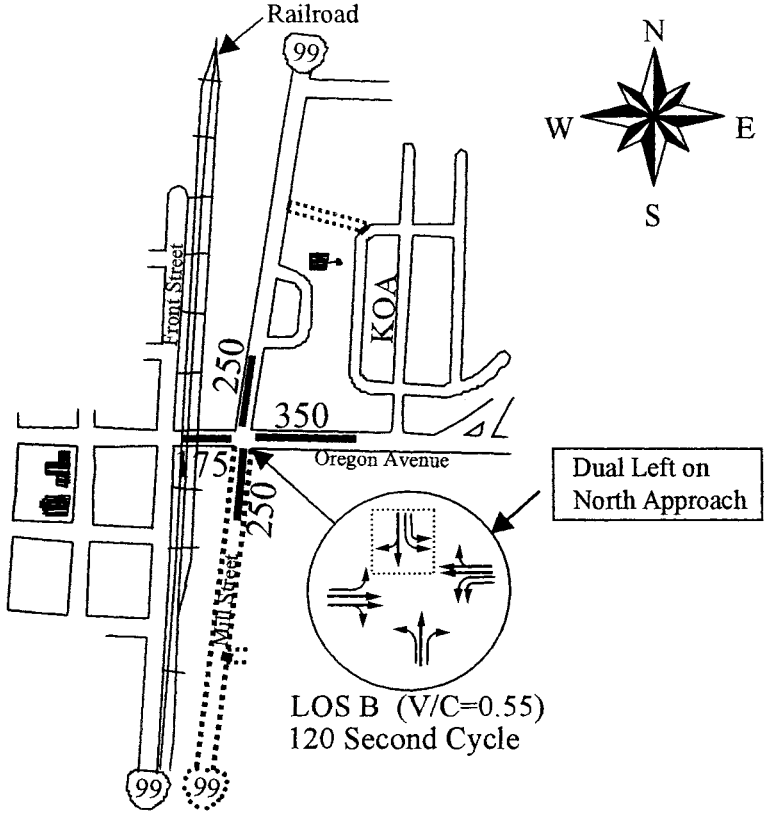
Storage Distances (Figure 15)

Figure 15 shows two schematics with the estimated storage distances for the proposed Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection. The additional eastbound and westbound lane on Oregon Avenue reduces storage distances on Oregon Avenue by providing an additional lane in each direction for vehicles to *stack* in.

In the year 2015, vehicles traveling westbound on Oregon Avenue would be *stacked* approximately 375 feet to the east. The schematic on the right in Figure 22 shows the effect a southbound, dual, left-turn lane would have on storage distance in lieu of a single, left-turn lane (schematic on the left). Southbound, dual, left-turn lanes in lieu of a single, left-turn lane would both improve the operational characteristics of the intersection and reduce the storage distance requirement. The LOS would improve from LOS C to LOS B.



Year 2015
Storage Distances (Feet)
Single Left (With Extensions)



Year 2015
Storage Distances (Feet)
Dual Left (With Extensions)

OREGON DEPARTMENT OF TRANSPORTATION TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, Build Concept 1 **Storage Distances for the Year 2015**	**File : Creswell~1.PPT**	**Prepared By: Harlan Nale**	FIGURE 15
	Date : 11/25/97	**Reviewed By: Brian Dunn**	

Concept 1 Was Accepted as the Preferred Alternative

The ODOT staff and Creswell CAC selected this concept. The concept:

- Achieves design goals and objectives, including LOS criteria for the interchange and local streets.
- The interchange design met or exceeded the design goal, objectives, and criteria related to safety and operations of the ramp terminals and for the various transportation modes that would use the interchange.
- It was cost effective given the proposed concept designs for the Goshen-Divide/Oregon Avenue intersection.
- The Goshen-Divide realignment has fewer right of way impacts than the other proposed concepts.

Concept 2: Goshen-Divide Highway Depressed Railroad Grade Separation

Description (Figures 16 and 17)

The structure is significantly improved:

- The bridge is rebuilt to modern design standards, which include widening to four lanes of traffic with shoulders;
- The profile grade is improved;
- Pedestrian, bicycle, and vehicular mobility and access is significantly improved; The east and west ramp terminals is redesigned;
- When necessary, a southbound entrance ramp is installed;
- Oregon Avenue is a five-lane section built to urban standards.

Melton Road, at the east ramp terminal, is aligned further east, at least 150 meters, away from the ramp terminal. The southbound ramp, on the west side, is also moved 70 meters further to the east from its existing location.

When warrants are met, there are traffic signals at the northbound and southbound ramp terminals, and Goshen-Divide Highway/Mill Street.

The intersection of Goshen-Divide and Oregon Avenue (Springfield-Creswell Highway) is realigned. The north leg of the Goshen-Divide/Oregon Avenue intersection is moved west to Front Street. The Goshen-Divide and Front Street intersection is signalized when warrants are met.

Goshen-Divide Highway is realigned south of Oregon Avenue. D Avenue is extended by a bridge over the railroad crossing connecting Mill Street to the Goshen-Divide Highway. King's Row is extended to the east, connecting with the realigned Goshen-Divide Highway. Mill Street is improved to urban standards (additional turn lanes, sidewalks, and drainage).

Median treatments are installed along Oregon Avenue from the southbound ramp terminal to Front Street.

Cost:

Local Streets (Grade separate the railroad)	$12.5 million
Interchange	$7.5 million
Total	$20 million

KINGS ROW

OREGON AVENUE

FRONT ST.

GOSHEN - DIVIDE HIGHWAY

RETAINING WALL

MILL ST.

SOUTHERN PACIFIC RAILROAD

RETAINING WALL

GOSHEN - DIVIDE HIGHWAY

SUGGESTED LOCATION FOR LOCAL ACCESS POINT

POST OFFICE

SUGGESTED LOCATION FOR LOCAL ACCESS POINT

MARKET ROAD

PACIFIC HIGHWAY (I-5)

KOA

MELTON ROAD

Figure 16

CONCEPT 2

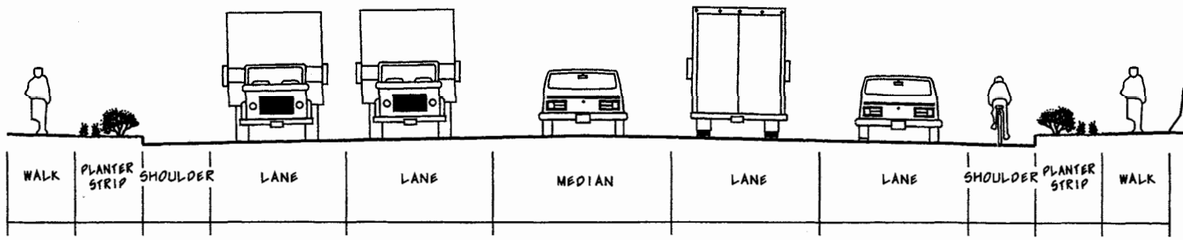
CRESWELL INTERCHANGE REFINEMENT PLAN
SEPTEMBER 30, 1997

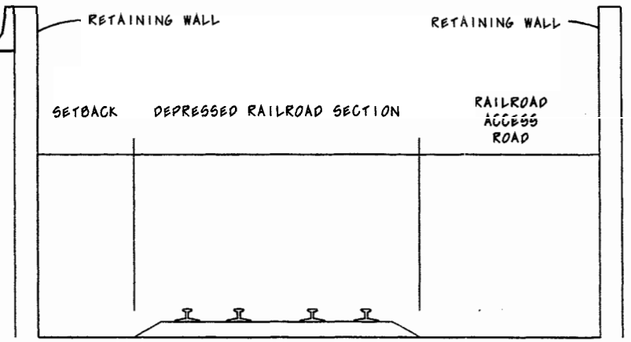
**** Major Realignment of ****
*** S. GOSHEN-DIVIDE HWY. ***
*** Depressed Railroad Grade Separation ***

LEGEND

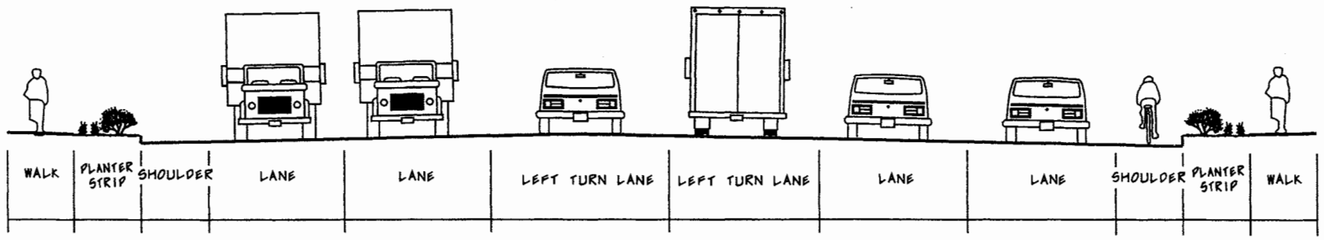
- Traffic Signal
- New Construction
- Right of Way Impact
- Bridge

CONCEPT 2

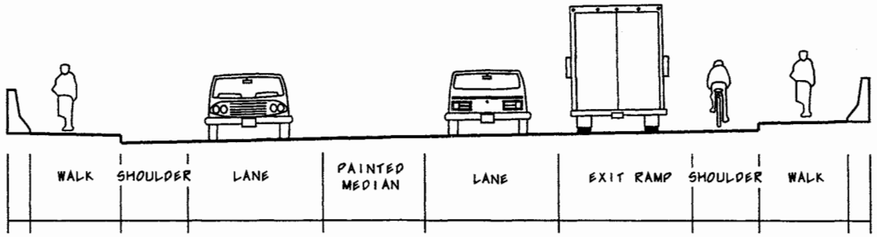




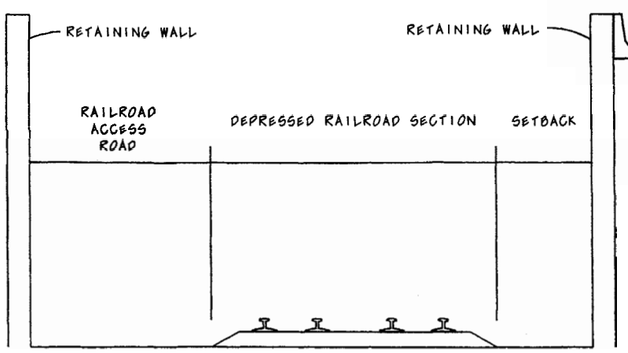
5. GOSHEN-DIVIDE HWY. @ OREGON AVE.

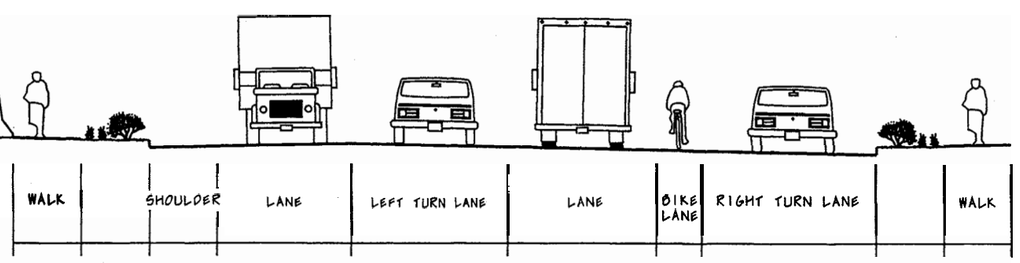


WESTBOUND OREGON AVE. @ S. GOSHEN-DIVIDE HWY.



EAST END OF BRIDGE CROSSING I-5
ON SPRINGFIELD-CRESWELL HWY.





FRONT ST./ SO. GOSHEN-DIVIDE HWY. @ OREGON AVE.

Figure17

OREGON DEPARTMENT OF TRANSPORTATION
PRELIMINARY DESIGN UNIT

CRESWELL INTCHG. REFINEMENT PLAN

DEPRESSED RAILROAD GRADE SEPARATION

ROADWAY TYPICAL SECTIONS

SEPTEMBER 30, 1997 NOT TO SCALE

nf7112d /usr/projects/creswell/cres typ.dgn 9/30/97

Advantages

- Constructs a new/wider structure over I-5 that accommodates all transportation modes.
- Improved sight distance at the ramp terminals because of new profile grade and wider structure on the Springfield-Creswell Highway.
- Reduces accident potential by removing the at-grade railroad crossing on Oregon Avenue.
- Improves the roadway section along Oregon Avenue to accommodate future traffic demand.
- Provides an acceptable LOS for all signalized intersections.
  New intersection of the Goshen-Divide Highway and Oregon Avenue improves traffic operations.
- Extension of D Avenue provides alternative west-east circulation route without railroad crossing.
- Maintains Mill Street as the truck route to the mill.
- Maximizes the distance from the ramp terminals to the closest access point.

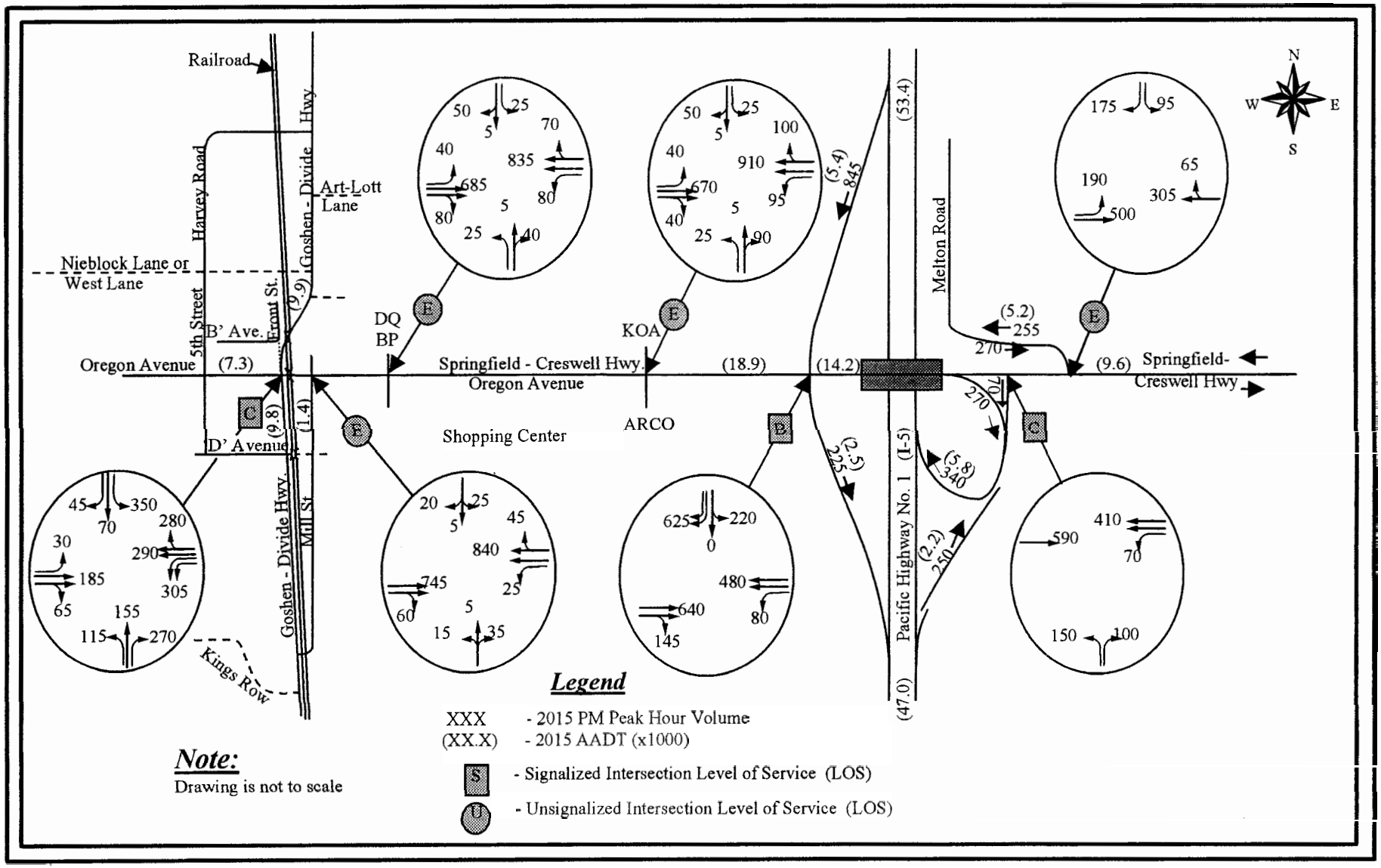
Disadvantages

Significant right-of-way impact to business and residences along Front Street and the S. Goshen-Divide Highway.

- High cost to depress the railroad.
- Maintains Mill Street as the truck route to the mill.
- Long storage lengths on Oregon Avenue will discourage some trips to/from services during the busiest time of the day (4-6 p.m.).
- Possible drainage issues with a depressed rail structure.

Traffic Analysis

Figure 18 shows the 2015 Design Hour volumes for Concept 2. Included in this figure are the peak and daily trips with LOS for key intersections such as the ramp terminals. The southbound ramp operates at LOS B while the northbound ramp operates at LOS C. The worst LOS occurs along the unsignalized portions of Springfield-Creswell Highway (Oregon Avenue) where LOS E is predicted in 2015.



Legend

XXX - 2015 PM Peak Hour Volume
(XX.X) - 2015 AADT (x1000)

S - Signalized Intersection Level of Service (LOS)

U - Unsignalized Intersection Level of Service (LOS)

Note:
Drawing is not to scale

OREGON DEPARTMENT OF TRANSPORTATION TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, Concept 2 - w/ TSP Extensions, 2015 Design Hour Volumes Depressed Railroad & Realign Goshen-Divide Hwy.	**FILE : Creswell-2.PPT**	**Prepared By: Harlan Nale**	FIGURE 18
	DATE : 11/26/97	**Reviewed By: Brian Dunn**	

Table 13: Year 2015 Levels of Service (LOS) for Concept 2

Intersection	Unsignalized	Signalized
Melton Road at Springfield-Creswell Highway	E	----
Northbound Freeway Ramps at Springfield-Creswell Highway	----	C
Southbound Freeway Ramps/Arco Station Access at Oregon Avenue	----	B
KOA Access at Oregon Avenue	E	----
BP Station/Shopping Center Accesses at Oregon Avenue	E*	----
Existing Goshen-Divide Highway/Mill Street at Oregon Avenue	E*	----
Realigned Goshen-Divide Highway (Front Street) at Oregon Avenue	----	C

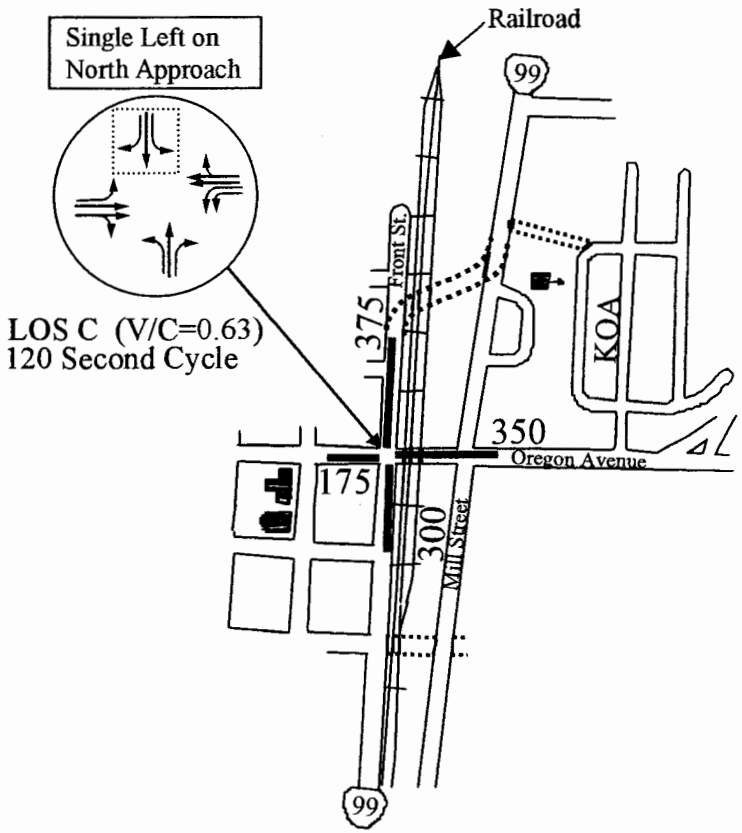
*The LOS shown in this table assumes that traffic queues from adjacent intersections do not cause adverse effects on intersection operation. If traffic queues from a *closely-spaced* intersection blocks the operation of the intersection that is being analyzed, the resulting LOS will probably be LOS F in lieu of the LOS that is reported in this table.

Storage Distances

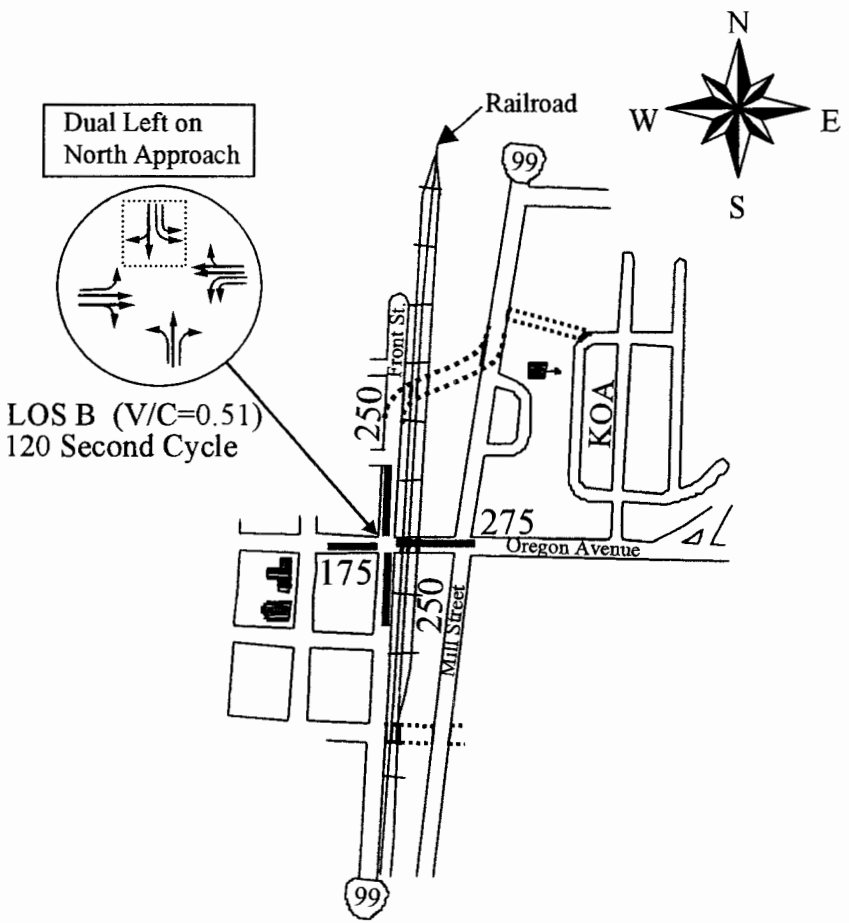
Figure 19 shows the estimated storage distances for the proposed Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection. The schematic on the right shows the effect a southbound, dual, left-turn lane would have on storage distance in lieu of a single, left-turn lane. A southbound, dual, left-turn lane in lieu of a single, left-turn lane would both increase the operational characteristics of the intersection and reduce the storage distance. However, traffic traveling westbound on Oregon Avenue will *stack* east of the existing Northern Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection, blocking turning movements during heavier travel times.

Reasons not Selected

- **The right-of-way impacts to businesses in downtown Creswell are significant.**
- **The cost, specifically to depress the rail line grade, is very high given the population and traffic forecasts; a cost effectiveness or cost/benefit analysis would most likely indicate a poor result.**
- **ODOT staff and the Creswell CAC agreed not to advance the concept.**



Year 2015
Storage Distances (Feet)
Single Left (With Extensions)



Year 2015
Storage Distances (Feet)
Dual Left (With Extensions)

OREGON DEPARTMENT OF TRANSPORTATION TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, Build Concept 2 **Storage Distances for the Year 2015**	**File : Creswell~1.PPT** **Date : 12/03/97**	**Prepared By: Harlan Nale** **Reviewed By: Brian Dunn**	FIGURE 19

Concept 3: Major Realignment of N. Goshen-Divide Highway

Description (Figures 20, 21, and 22)

The structure is significantly improved:

- The bridge is rebuilt to modern design standards, which include widening to four lanes of traffic with shoulders;
- The profile grade is improved;
- Pedestrian, bicycle, and vehicular mobility and access is significantly improved;
- The east and west ramp terminals is redesigned;
  When necessary, a southbound entrance ramp is installed;
- Oregon Avenue is improved to a five-lane section built to urban standards.

Melton Road at the east ramp terminal is aligned further east, at least 150 meters, away from the ramp terminal. The southbound ramp, on the west side, is also moved 70 meters further to the east from its existing location.

When warrants are met, there are traffic signals at the northbound and southbound ramp terminals, and Goshen-Divide Highway/Mill Street.

The intersection of Goshen-Divide and Oregon Avenue (Springfield-Creswell Highway) are signalized when warrants are met and realigned to the west side of the railroad tracks and connect with the intersection of Nieblock Lane at West Lane.

There are median treatments along Oregon Avenue from the southbound ramp terminal to Front Street.

Cost:

Local Streets (Grade separate the railroad)	$5.6 million
Interchange	$7.5 million
Total	$13.1 million

Advantages

- Constructs a new/wider structure over I-5 that accommodates all transportation modes.
- Improved sight distance at the ramp terminals because of new profile grade and wider structure on the Springfield-Creswell Highway.
- Improves the roadway section along Oregon Avenue to accommodate future traffic demand.
- Eliminates the jog across the railroad tracks on Oregon Avenue for through southbound trips.
- Maximizes spacing of signalized intersections at west ramp terminal and the intersection of Oregon Avenue at the Goshen-Divide Highway.

- Provides access to developing residential area on north end of the city by Nieblock or West Lane Roads or Harvey Road.
- Provides an acceptable LOS for all signalized intersections.
- Maintains Mill Street as the truck route to the mill.
- Maximizes the distance from the ramp terminals to the closest access point.

Disadvantages

- Significant right-of-way impact to business and residences along Front Street and the Goshen-Divide Highway corridor.
- Creates out of direction movement for development on north end of the existing Goshen-Divide Highway.
- Maintains Mill Street as the truck route to the mill.
- Land use issues associated with an alignment outside the UGB.
  Long storage lengths on Oregon Avenue will discourage some trips to/from services during the busiest time of the day (4-6 p.m.).

Traffic Analysis

Figure 23 shows the 2015 Design Hour volumes for Concept 3. Included in this figure are the peak and daily trips with LOS for key intersections such as the ramp terminals. The southbound ramp operates at LOS B while the northbound ramp operates at LOS C. The worst LOS occurs along the unsignalized portions of Springfield-Creswell Highway (Oregon Avenue) where LOS F is predicted in 2015 at the ARCO gas station/KOA intersection and the BP gas station and shopping center intersection.

Table 14: Year 2015 Levels of Service for Concept 3

Intersection	Unsignalized	Signalized
Melton Road at Springfield-Creswell Highway	E	----
Northbound Freeway Ramps at Springfield-Creswell Highway	----	C
Southbound Freeway Ramps/Arco Station Access at Oregon Avenue	----	B
KOA Access at Oregon Avenue	F	----
BP Station/Shopping Center Accesses at Oregon Avenue	F	----
Existing Goshen-Divide Highway/Mill Street at Oregon Avenue	E*	----
Realigned Goshen-Divide Highway (Front Street) at Oregon Avenue	----	B

*The LOS shown in this table assumes that traffic queues from adjacent intersections do not cause adverse effects on intersection operation. If traffic queues from a *closely-spaced* intersection blocks the operation of the intersection that is being analyzed, the resulting LOS will probably be LOS F in lieu of the LOS that is reported in this table.

KINGS ROW

OREGON AVENUE

1ST ST.

GOSHEN - DIVIDE HIGHWAY

FRONT ST.

MATCH LINE (SEE SHEET NO. 2)

GOSHEN - DIVIDE HIGHWAY

MILL ST.

SOUTHERN PACIFIC RAILROAD

SUGGESTED LOCATION FOR LOCAL ACCESS POINT

GOSHEN - DIVIDE HIGHWAY

POST OFFICE

MARKET ROAD

SUGGESTED LOCATION FOR LOCAL ACCESS POINT

KOA

PACIFIC HIGHWAY (I-5)

MELTON ROAD

Figure 20

CONCEPT 3

CRESWELL INTERCHANGE REFINEMENT PLAN
SEPTEMBER 30, 1997

**** Major Realignment of ****
*** N. GOSHEN-DIVIDE HWY. ***

PART 1 OF 2

LEGEND

- Traffic Signal
- New Construction
- Right of Way Impact
- Bridge

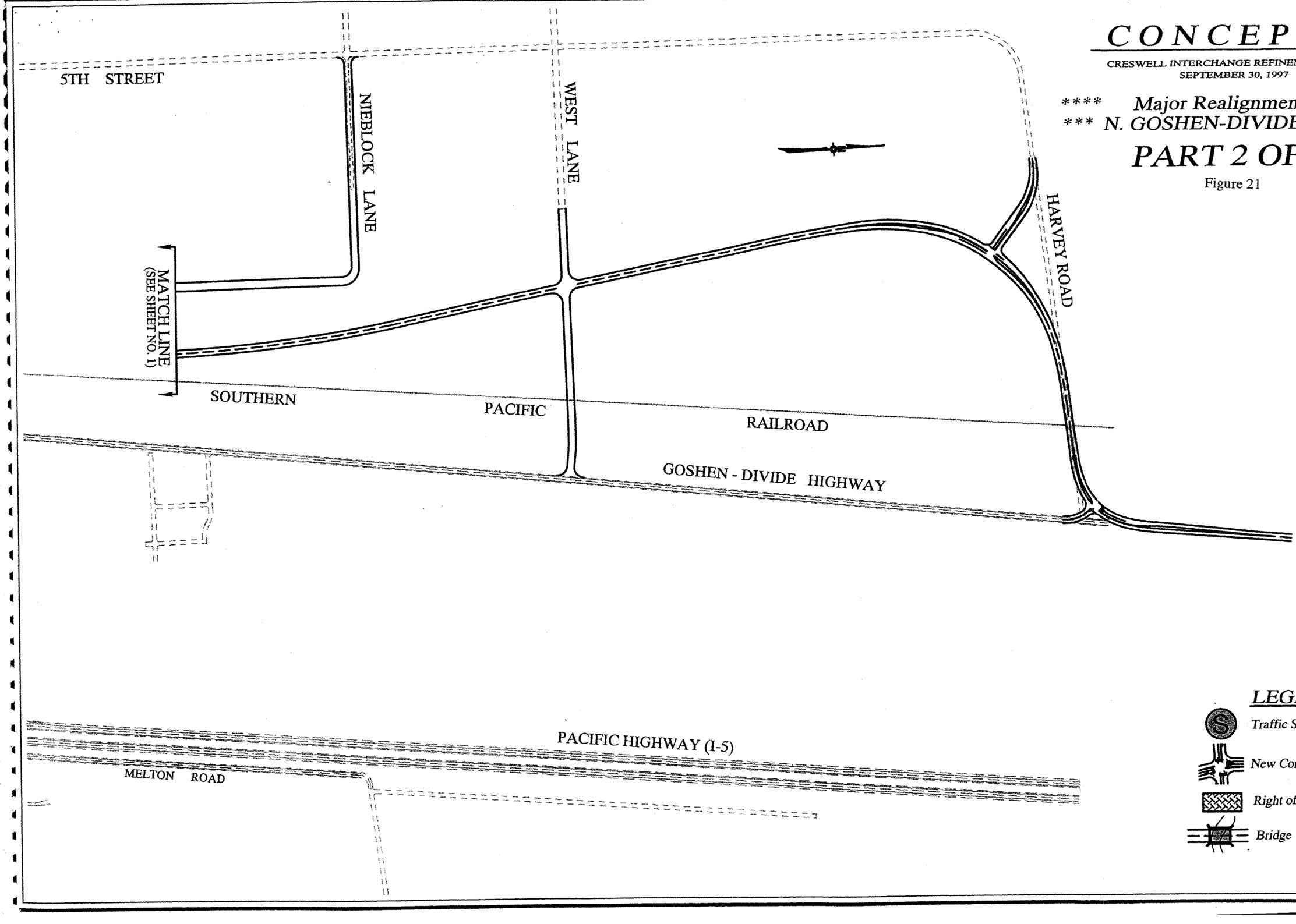
CONCEPT 3

CRESWELL INTERCHANGE REFINEMENT PLAN
SEPTEMBER 30, 1997

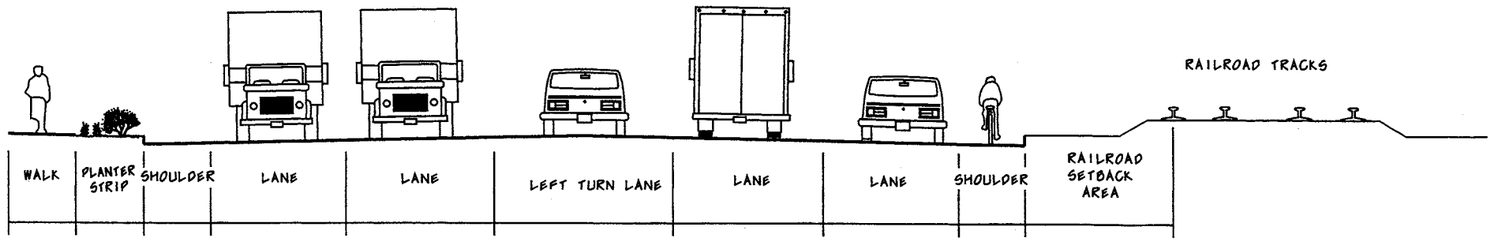
**** Major Realignment of ****
*** N. GOSHEN-DIVIDE HWY. ***

PART 2 OF 2

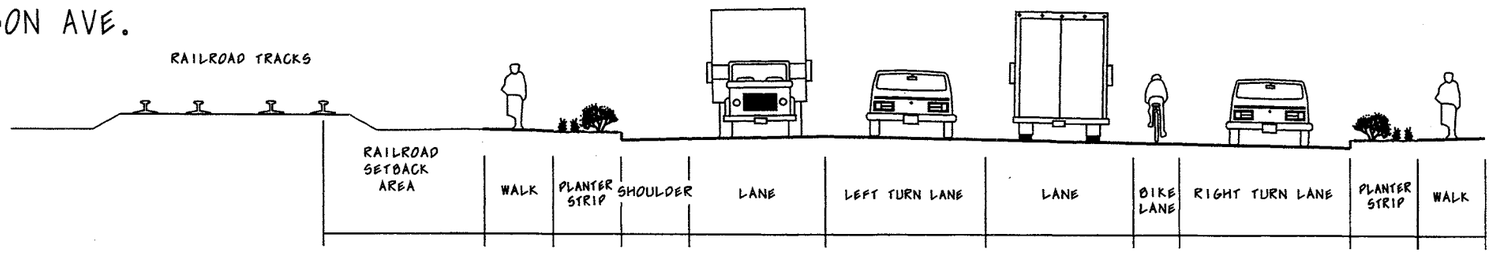
Figure 21



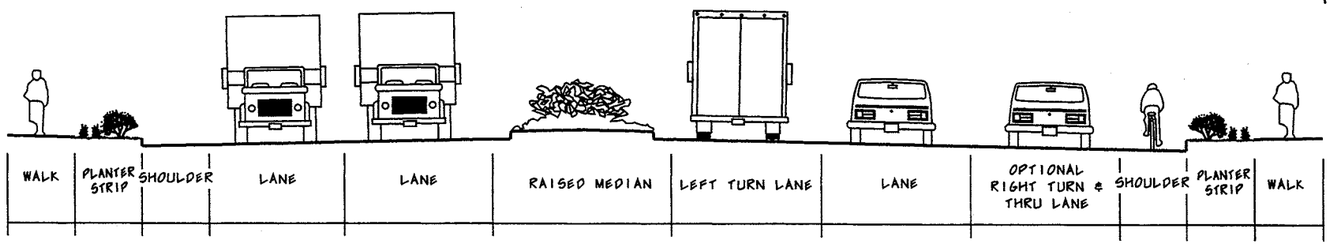
CONCEPT 3



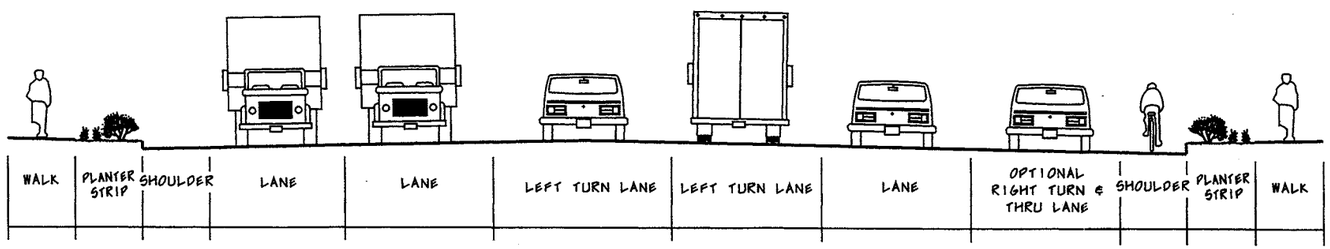
S. GOSHEN-DIVIDE HWY. @ OREGON AVE.



FRONT ST./ SO. GOSHEN-DIVIDE HWY. @ OREGON AVE.



EASTBOUND OREGON AVE. @ FRONT ST/S. GOSHEN-DIVIDE HWY.



WESTBOUND OREGON AVE. @ FRONT ST/S. GOSHEN-DIVIDE HWY.

Figure 22

OREGON DEPARTMENT OF TRANSPORTATION
PRELIMINARY DESIGN UNIT

CRESWELL INTCHG. REFINEMENT PLAN
MAJOR REALIGNMENT N. GOSHEN-DIVIDE HWY.

ROADWAY TYPICAL SECTIONS

SEPTEMBER 30, 1997 NOT TO SCALE

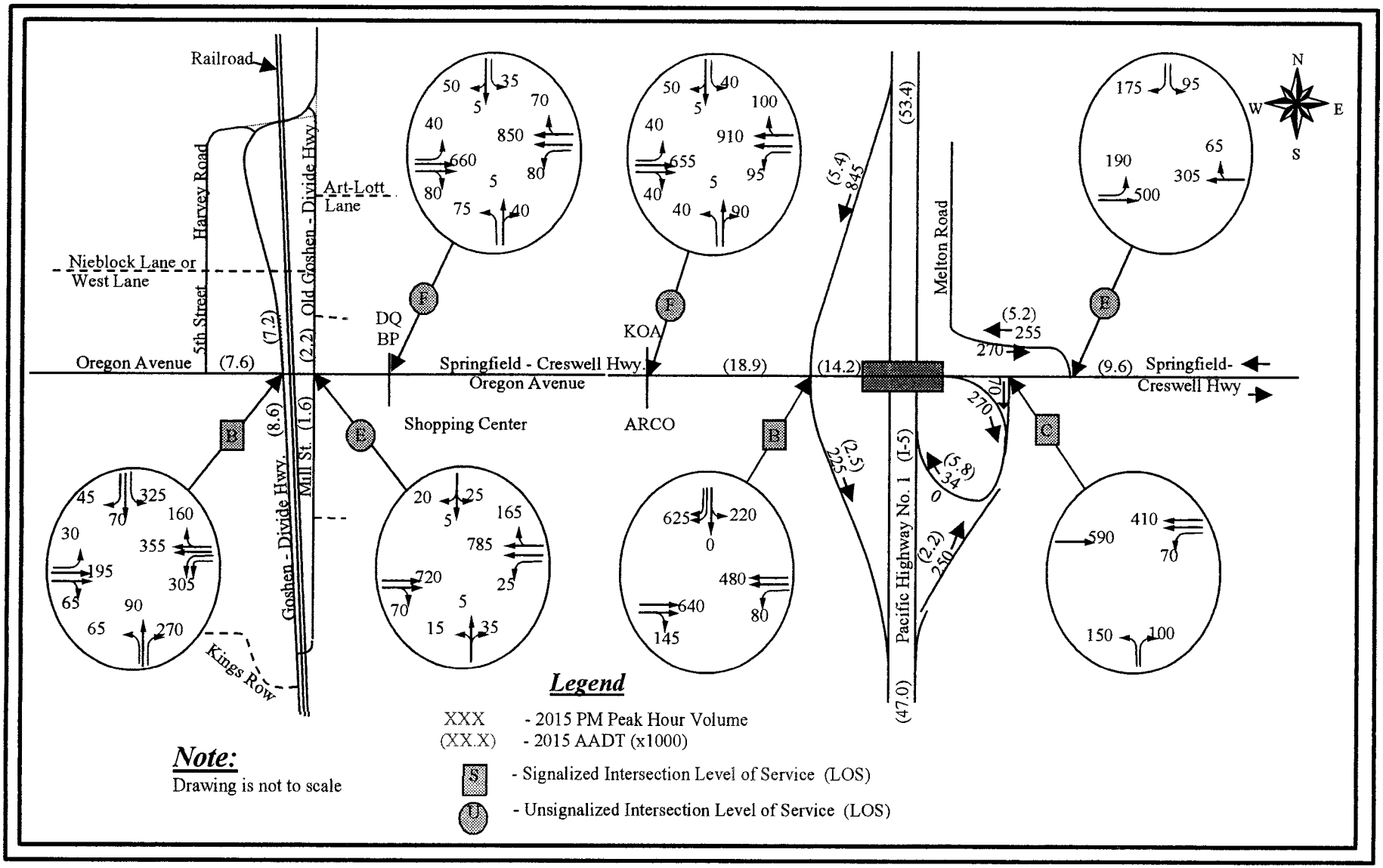
nt7112d /usr/projects/creswell/cres typ.dgn 9/30/97

Storage Distances

Figure 24 shows the estimated storage distances for the proposed Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection. The schematic on the right shows the effect a southbound, dual, left-turn lane will have on storage distance in lieu of a single, left-turn lane. A southbound, dual, left-turn lane in lieu of a single, left-turn lane will both improve the operational characteristics of the intersection and reduce the storage distance. However, traffic traveling westbound on Oregon Avenue will *stack* east of the existing Northern Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection blocking turning movements during heavier travel times.

Reasons not selected

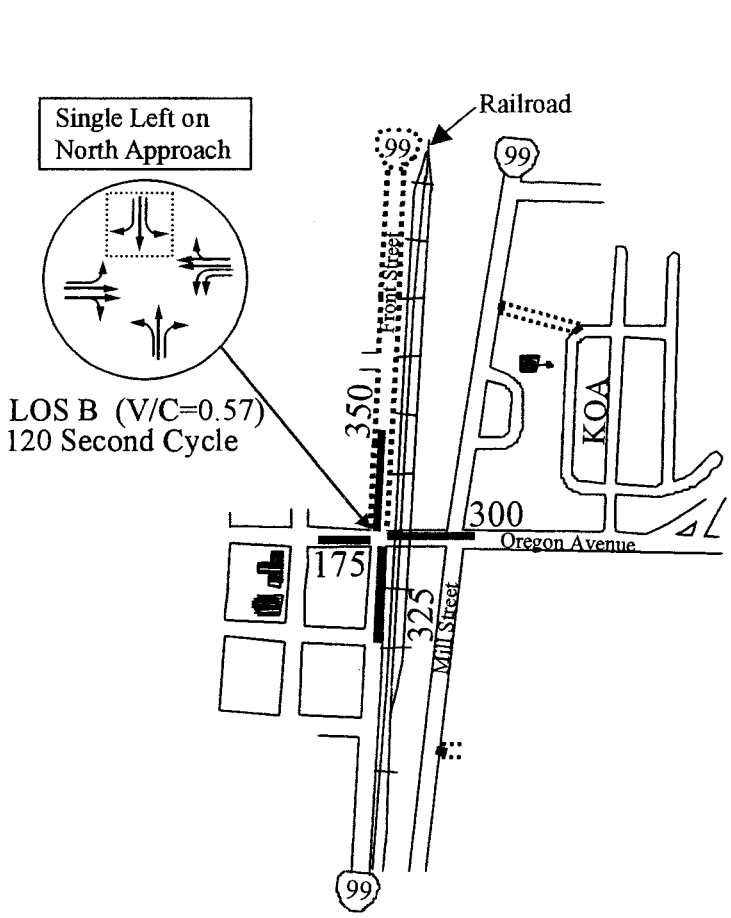
- **Significant right-of-way impacts to downtown businesses along Front Street.**
- **Land use issues (goal exceptions) with a new alignment of Goshen-Divide to Nieblock and Front Street.**
- **Difficult to obtain an at-grade railroad crossing.**
  ODOT staff and the Creswell CAC agreed not to advance this concept.



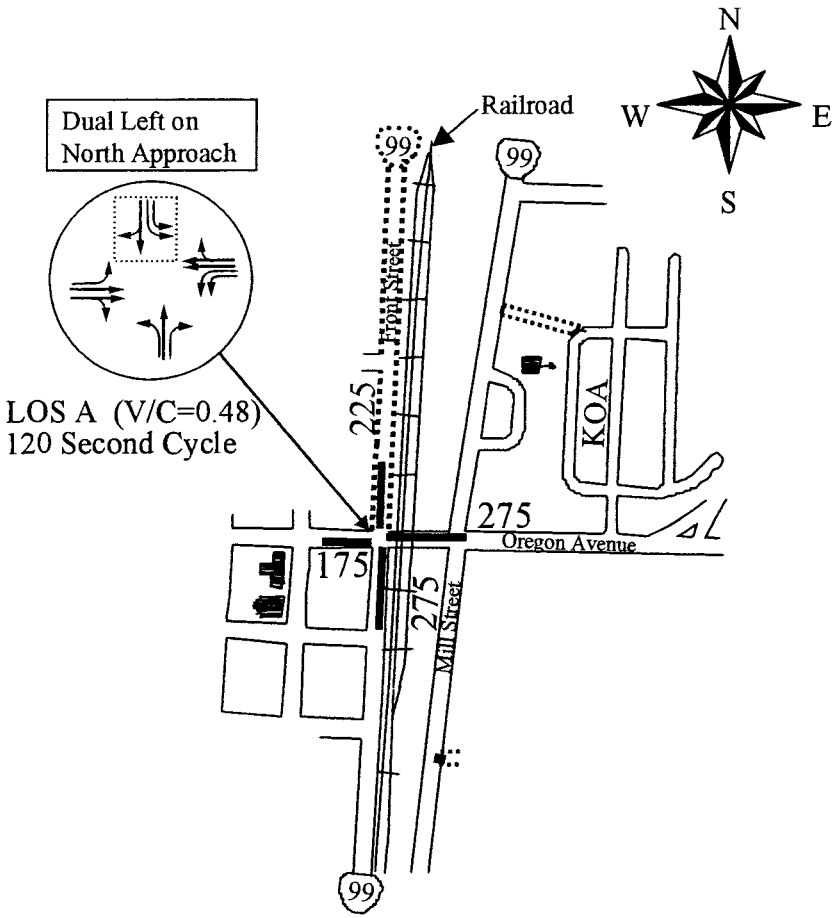
OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, Concept 3 - w/ TSP Extensions, 2015 Design Hour Volumes Realign Goshen-Divide Hwy.	FILE : Creswell-2.PPT	Prepared By: Harlan Nale	FIGURE 23
	DATE : 11/26/97	Reviewed By: Brian Dunn	



Year 2015
Storage Distances (Feet)
Single Left (With Extensions)



Year 2015
Storage Distances (Feet)
Dual Left (With Extensions)

OREGON DEPARTMENT OF TRANSPORTATION TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, Build Concept 3 **Storage Distances for the Year 2015**	**File : Creswell~1.PPT** **Date : 12/03/97**	**Prepared By: Harlan Nale** **Reviewed By: Brian Dunn**	FIGURE 24

Table 15: Project Objective Evaluation

Project Evaluation	No Build	April 29, 1997 Open House		Advanced Concepts		
		Concept		Concept		
		1	2	1	2	3
Significantly meets overall Goals, Objectives, Design Criteria	∅	∅	∅	✔	✔	∅
Acceptable Distance Between Freeway Ramps and Adjacent Accesses	∅	∅	∅	✔	✔	✔
Eliminates the *Jog* of Goshen-Divide Highway	∅	∅	∅	✔	✔	✔
Improves Connectivity for the Portion of Oregon Avenue Located East of the Railroad Tracks	∅	∅	∅	✔	✔	∅
Limits Impact to both Residential and Business Properties	N/A	N/A	N/A	✔	∅	∅
Project is Cost Effective	N/A	N/A	N/A	✔	∅	✔

✔ Significantly Satisfies Project Goals/Objectives
∅ Does not Satisfy Project Goals/Objectives
N/A Not Applicable to Project

Concept Costs

Table 16 summarizes the concepts according to LOS and cost for local streets and the interchange.

Table 16: Level of Service and Cost Matrix

Creswell Interchange Refinement Plan					
Concept Matrix					
			Cost (Millions)		
Concept	Intersection	Level of Service	Intchg.	Hwy. 99	Total
1	Oregon Avenue at Mill St./Highway 99 (North)	C			
	Kings Row at Highway 99 (South)	A			
	West side ramp terminal	C			
	East side ramp terminal	C			
			$7.5	$6.0	$13.5
			Cost (Millions)		
Concept	Intersection	Level of Service	Intchg.	Hwy. 99	Total
2	Oregon Ave./Front Street at Highway 99 (North)	C			
	Highway 99 (South) at D Avenue	C			
	West side ramp terminal	C			
	East side ramp terminal	C			
			$7.5	$12.5	$20.0
			Cost (Millions)		
Concept	Intersection	Level of Service	Intchg.	Hwy. 99	Total
3	Oregon Ave./Front Street at Highway 99 (North)	C			
	West side ramp terminal	C			
	East side ramp terminal	C			
			$7.5	$5.6	$13.1

Chapter 6
Implementation Measures for the Preferred Alternative

Local and State Adoptions

The Refinement Plan must be adopted by the City of Creswell and Lane County Board of Commissioners. Adoption at the local and regional levels is required by Oregon Administrative Rules (731-015-0005), Coordination Rules. These rules govern the adoption of facility plans such as interchanges. This affects state agency coordination as well as local governments. The Rule says that facility plans must be "compatible with the acknowledged comprehensive plan...."

Adoption by the Oregon Transportation Commission is also required.

Funding and Engineering Plans

An adopted interchange plan begins the process for garnering Statewide Transportation Improvement (STIP) Program funding. If the interchange plan is adopted, it becomes viable for state and federal funding but must compete for this funding with other ODOT project proposals in Lane County and the Willamette Valley or ODOT Region 2.

STIP funding enables the Refinement Plan to undergo detailed engineering designs. These designs are created for placing a project out to bid and include obtaining federal highway approval. Also at this stage, the preferred alternative must satisfy federal environmental laws and the alternative is again evaluated.

Access Management Assumptions

It is very important to manage and protect an investment such as an interchange project. To ensure the ramp terminals operate at acceptable levels of service and to ensure that these terminals are not congested shortly after a project is implemented, it is necessary to implement ODOT Access Management policies.

In order for the ramp terminals and signalized intersections to function and operate at safe and acceptable levels of traffic flow for all modes, the access points must be managed. It may be necessary at the time of the construction designs to implement raised medians along Springfield-Creswell Highway from the southbound ramp terminal to the intersection with Goshen-Divide Highway. In addition, local street connections and driveways near the ramp terminals will be managed or diverted to ensure the safety and operations of the interchange.

Access Management may be an issue with some of the property and business owners along Springfield-Creswell Highway (Oregon Avenue). For this preliminary design stage in a refinement plan, it is unknown exactly what parcels would be impacted regarding

access management. ODOT and the City of Creswell will need to work with local businesses to determine an access management strategy or plan that protects an adopted interchange alternative. At a minimum, this refinement plan contains a 500-foot access control line from the ramp terminals.

Chapter 7
Public Involvement

Citizen Advisory Committee

The Creswell Citizen Advisory Committee (CAC) met for over a year ostensibly for the Creswell Transportation System Plan (TSP) but also to review, refine, and comment on the Refinement Plan. All Oregon Department of Transportation (ODOT) proposals, proposed designs, and policy proposals were submitted to the CAC for review, comment, and edits. It was clearly established in the early phases of the Refinement Plan that the CAC was responsible for recommending an alternative for the interchange.

The CAC meet regularly and at least for the later part of the project, twice a month. **On September 30, 1997, the CAC voted to recommend Concept 1 as the preferred alternative for the Refinement Plan. Of the ten CAC members at the meeting, nine voted for Concept 1 and one member chose not to vote.**

Open Houses

There were two open houses to discuss the TSP and interchange Refinement Plan:

- **Creswell TSP Open House**
  October 8, 1996
  Creswell Community Center

The purpose of this open house was to introduce the goals and objectives of the Refinement Plan and to ask for comments from the public about transportation issues at and near the interchange. Attendance was low. ODOT gave a presentation about how a Refinement Plan is conducted and spoke about the existing issues at the interchange.

Voice Your Opinion on the I-5 Interchange
April 29, 1997
Creswell Community Center

This meeting was set up specifically for property owners and businesses along Oregon Avenue and near the interchange. This meeting was at the request of the CAC because property owners would be the people directly impacted by a future interchange project. Postcards were sent to about 25 targeted businesses along Oregon Avenue and over 100 property and business owners. The meeting was open to the public at large and was advertised in the local paper and posted at City Hall.

At the meeting, ODOT presented two design concepts. The concept for the interchange was the same in each idea. There were two different designs for the local street system. Comment forms were distributed asking for input but few were returned. About 25 people

attended. The two local street ideas raised many concerns and questions because they would impact parcels on Oregon Avenue.

After evaluating the results of the meeting comments and reviewing the goals, objectives, and criteria for the interchange plan, ODOT and the CAC rewrote the objectives and goal for the interchange and began creating another set of design concepts, which were then presented to the CAC for review and recommendation.

Appendix A
Definitions

Access Management: Measures regulating access to streets, roads, and highways from public streets or roads and private driveways. Measures may include but are not limited to restrictions on the siting of interchanges, restrictions on the type and amount of access to roadways, and the use of physical controls, such as signals and channelization including raised medians to reduce impacts of approach road traffic on the main facility. (Ref. OAR 660-12-005)

Arterial Highway: A highway primarily for through traffic, usually on a continuous route.

Average Daily Traffic (ADT): The annual average two-way daily traffic volume. It represents the total traffic for the year, divided by 365.

Collector-Access: A term used to describe a road or system of roads providing land access.

Corridor Plan: A long-range plan for managing and improving transportation facilities and serves to meet needs for moving people and goods.

Interchange: A facility that separates intersecting roadways and provides directional ramps for access movements between the roadways. The structure and the ramps are considered part of the interchange.

ISTEA: The federally enacted Intermodal Surface Transportation Efficiency Act of 1991, which provided authorizations for highway, highway safety, and mass transportation for the following six years.

LOS: Level of Service is a qualitative measure of the effect of a number of factors on transportation service including speed and travel time, traffic interruptions, freedom of movement, safety, driving comfort, and convenience.

Modes of Transportation: Mass transit, air, water, pipeline, rail, highways, bicycle, and pedestrian. The terms "modes," "mode connectivity," and "intermodal" refer to these transportation means.

Protect: Asserts ODOT's role as guarantor of statewide priorities such as road locations or alignments.

OHP: The Oregon Highway Plan is the states road plan and includes policies and guidelines for the road system.

OTP : The Oregon Transportation Plan is a long-range comprehensive plan for the state transportation system and outlines goals, objectives and policies.

Rural: Any area not included in a business, industrial, or residential zone of moderate or high density, whether or
not it is within the boundaries of a municipality.

SIGCAP2: This is a computer program for ODOT to measure the traffic level of service and delay at a signalized intersection.

STIP: State Transportation Improvement Program. The list of state transportation projects, timing, amounts and locations.

TDM: Transportation Demand Management are actions designed to change travel behavior in order to improve performance of transportation facilities and to reduce need for additional road capacity. Methods may include but are not limited to the use of alternative modes, ridesharing and vanpool programs, trip reduction ordinances. (Ref. OAR 660-12-005)

TPR: The State Transportation Planning Rule contained in Oregon's Administrative Rule, Chapter 660, Division 12, which implements the statewide planning goal 12 (Transportation).

TSP: Transportation System Plans are required by the TPR for cities over 2500, counties and Metro areas such as Eugene-Springfield. Specific requirements are detailed in the TPR.

UGB: Urban Growth Boundary. A line drawn around a geographic area which separates urban use lands from resource, or rural use land.

UNSIG 10: This is a computer program for ODOT to measure the traffic level of service and delay at an unsignalized intersection.

Urban: Any territory within an incorporated area or with frontage on a highway which is at least 50% built-up with structures devoted to business, industry, or residences for a distance of a quarter mile or more.

Urbanizing: Areas within an urban growth boundary that are undeveloped.

V/C : The volume to capacity ratio is a measure of roadway congestion, calculated by dividing the number of vehicles passing through a section of highway during a peak 15 minute interval by the capacity of the section.

Appendix B
Bibliography

Documents referenced for creating Creswell Interchange Refinement Plan

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"Additional Interchanges to the Interstate System Policy"
Federal Register: February 11, 1998 (Volume 63, Number 28)

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Oregon Transportation Commission, June 1991

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Oregon Transportation Commission, September 15, 1992

Willamette Valley Strategy, Phase One Report
Oregon Transportation Commission, August 16, 1995

Oregon Transportation Commission Policies
"Bypass and Major Improvement Policy, June 20, 1995"
"New Interchange Policy, July 15, 1988"

Creswell Comprehensive Plan
Creswell City Council, September 13, 1982
Periodic Review 1990

Oregon Administrative Rules 660-12-000
Transportation Planning Rule

Interchange Design Guide
Oregon Department of Transportation, Preliminary Design Unit, 1998

Geometric Design of Highways and Streets
American Association of State Highway and Transportation Officials
Washington D.C., 1990

Access Management Manual
Oregon Department of Transportation, August 18, 1991

Appendix C
Scope of Work

Creswell Milestone Schedule

June 1996

The schedule roughly follows the Creswell Transportation System Plan (TSP) work program

Project Tasks	Months
1) Define objectives and TSP coordination	**5/96 to 6/96 (1-2 mos.)**
2) Definition of issues and assumptions	**5/96 to 6/96 (2 mos.)**
3) Base Case analysis	**5/96 to 7/96 (2-3 mos.)**
4) Define range of plan alternatives	**8/96 to 11/96 (3-4 mos.)**
5) Define preferred alternative	**12/96 (1-2 mos.)**
6) Final Recommendations	**1/97 (1 mos.)**
7) TSP implementation	**4/97 (ongoing)**

The Creswell TSP should be adopted by the Creswell City Council by May 1997. The development of the final draft system plan which includes final preferred interchange design, would occur by March 1997.

DRAFT
Creswell Interchange Refinement Study
Scope Plan
June 96

Project Description

This refinement plan is a study of the issues, problems and alternatives regarding transportation and land use issues at the Creswell/I-5 interchange. Refinement plans are generally more detailed than Transportation System Plans (TSPs). A refinement plan is also intended to isolate and analyze a particular aspect of a transportation system within a TSP or corridor study. In the Creswell TSP, the study of the I-5 interchange requires an in-depth analysis that is more extensive than the TSP efforts.

The Creswell interchange and State Highway 99 define in large part the design and character of Creswell. These state facilities, coupled with the rail line, pose unique issues and possible dilemmas for transportation and land uses in Creswell. The refinement plan will explore and ascertain the real and perceived issues and problems concerning the interchange.

The refinement plan will be conducted by the Oregon Department of Transportation (ODOT) and Lane Council of Government (LCOG) staff. Nick Arnis, ODOT Region Planner for District 5 will manage the study. ODOT's Traffic and Planning Analysis staff will conduct the traffic studies and the Preliminary Design Unit will conduct the engineering analysis. The plan should be coordinated with the Creswell TSP planning process and become a chapter in the final TSP. Citizen involvement and review is integral and will coincide with the TSP citizen advisory committee meetings, workshops and other forms of public involvement determined by the LCOG staff. When tasks are completed, the information will also be distributed for review and comment to the regional TSP Technical Coordinating Committee.

An intent of this refinement plan is to focus on the relationship between land use and transportation issues. It is not enough to merely center this plan on the interchange directly. There are numerous access, land management and safety concerns around the interchange that need to be addressed in this study. Also, the interchange plan will analyze all modes of travel. Trucks, service vehicles and commuter autos are integral users of the facility, but transit, pedestrian and bicycle access and mobility will be components of a final plan.

Scope of Work

Task 1: Establish Scope of Work and TSP Coordination

Objectives:

Introduce parameters and goals of study.

Create clear, obtainable and unambiguous project goals, objectives, tasks and products.

Obtain consensus from stakeholders on scope of work tasks, project schedule, and roles and responsibilities of participants.

- Assign duties and tasks and begin the study process.
- Coordinate with Creswell TSP public involvement and technical committee process.

Assess budget and scope.

Methods:
Create the scope of work with ODOT traffic and preliminary design staff. Arrange meetings with Creswell TSP committees to present scope of work. Form consensus on the scope of work and schedule.

Products:

Scope of Work and Schedule

Budget for study

Task 2: Definition of Issues and Assumptions

Objectives:

- Define the study area and positions for traffic counts.
- Develop 2017 design hour volumes (DHV) for the study area.
- Determine the land use and transportation scenario for the area.
- Define major transportation, environmental, social, or political constraints and issues including pedestrians, transit and bicycles.
- Continue coordination with LCOG staff and TSP committees
- Assess study budget and scope.

Methods:
ODOT Traffic Analysis Unit will collect Potential Development Impact Analysis (PDIA) data from LCOG staff and traffic volume data for these PDIA zones: R206, M5, R210, and R199. A review of LCOG and ODOT traffic and land use assumptions will occur to ensure consistency. Hose and manual traffic counts will be conducted at the interchange ramp terminals. A review of ODOT's safety data will also occur. Continued coordination with LCOG staff will occur to determine

a base case for land use and transportation scenario. Past and present land use and transportation studies will be gathered and analyzed.

Products:

- A 2017 design hour traffic volume count for the interchange ramp and terminals.
- An analysis of current and past land use and transportation studies.
- An analysis of major issues and constraints, including safety.

Task 3: Base Case Analysis and Future 2017 Scenario

Objectives:

- Review and assess the land use, transportation and major issues analyses.
- Develop a base case analysis and future 2017 transportation scenario.
- Coordinate with LCOG TSP committees and determine presentation of base case and future 2017 analysis.
- Assess budget and scope.

Methods:

A review of the gathered information will generate the creation of a base case and future scenario. Coordination will occur between LCOG and ODOT to ensure agreement on the assumptions of the base case. This includes review and comment by the LCOG TSP committees. ODOT's Traffic Analysis Unit will provide data concerning Levels of Service (LOS), volumes and other transportation assumptions.

Products:

- A base case analysis that includes:
  Levels of Service (LOS);
  land use assumptions;
  a multimodal system;
  an analysis of constraints (social, environmental, political);
  and traffic volumes.
  A Future Scenario that includes:
  LOS;
  land use assumptions;
  multimodal system;
  an analysis of constraints;
  and future traffic volumes.

Task 4: Define Range of Plan Alternatives

Objectives:

- Assess the base case and future scenario.
- Define the maximum number of alternatives.
- Identify and develop a method for creating alternatives.
- Identify and define the criteria for evaluating the alternatives
- Assess budget and scope

Methods:
With the base case and future scenario information, alternatives will be defined. Due to resources, a maximum number of alternatives will be determined. ODOT's Preliminary Design Unit will create the alternatives based on the input from the base case and future scenario components. Coordination and review of alternatives by LCOG staff and TSP committees is essential. Also, ODOT will begin to create criteria for evaluating the alternatives.

Products:

- A technical memo describing the alternatives which includes: costs; Right of Way (ROW); social, environmental, planning and design constraints; and other major issues.
- A set of designs for each alternative.
- A technical memo outlining the criteria for evaluating alternatives.

Task 5: Define Preferred Alternative

Objectives:

- Consensus on the criteria used for the selection of a preferred alternative.
- Decide on a Preferred Alternative.
- Present the Preferred Alternative to the TSP committees.
- Assess budget and scope.

Methods:
The Preliminary Design Unit will work closely with the Traffic Analysis Unit to produce a preferred alternative. An important step in this selection is the participation of the TSP committees. A consensus regarding the criteria used for the preferred alternative must be achieved.

Products:

- A technical memo describing the preferred alternative that includes: costs; ROW; social, environmental, planning and design constraints; and other major issues impacting the preferred alternative.

Task 6: Final Recommendations and TSP Implementation

Objectives:

- **Produce** a final recommendation and study report.
  Coordinate with the TSP committees and LCOG for inclusion of preferred design and technical memo into final TSP.
- Determine implementation plan for ODOT STIP.

Methods:

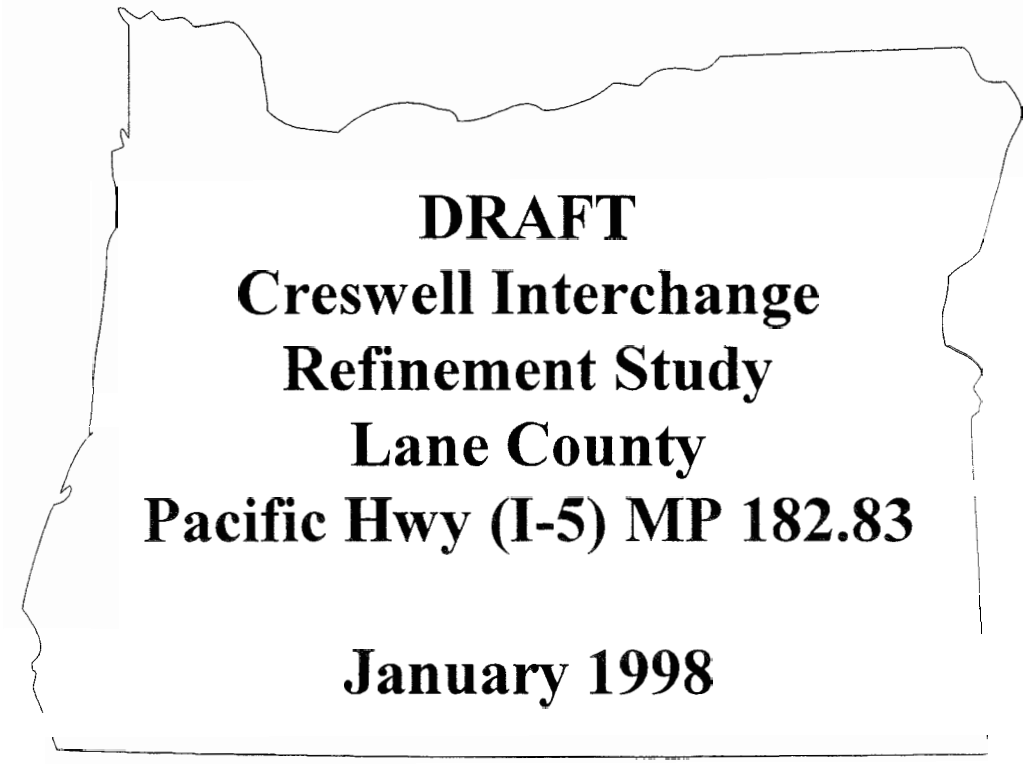
The project manager will create the final report for the Creswell TSP and ODOT. Review by the Preliminary and Traffic Design Units will occur. A draft will also be reviewed by the TSP committees including LCOG. The detail of the final plan will determine how the preferred alternative is implemented into the ODOT STIP. The essence of this final task is to have the plan adopted and funded by ODOT, Creswell and the TSP committees. The project manager will also evaluate the overall scope of work and produce a final budget summary.

Products:

A draft and final refinement planning document.
A technical memo for how the plan will be adopted and implemented.
Final budget analysis and evaluation of the project scope of work

Appendix D
ODOT Traffic Analysis

Oregon Department of Transportation



DRAFT
Creswell Interchange Refinement Study
Lane County
Pacific Hwy (I-5) MP 182.83

January 1998

Transportation Planning Analysis Unit
Transportation Development Branch, Salem, Oregon

Creswell Interchange Refinement Study

Oregon Department of Transportation
Transportation Planning Analysis Unit
555 13th Street NE
Salem, Oregon 97310

Prepared By: Harlan L. Nale, P.E.
Reviewed By: Brian Dunn, P.E.

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EXECUTIVE SUMMARY

This refinement plan is a study of the issues, problems and possible alternatives regarding transportation and land use at the Creswell/Interstate-5 interchange. The goal of this refinement plan is to develop an alternative for the interchange that will improve its safety and operation. The preferred alternative will become part of Creswell's TSP.

Creswell is located nine miles south of Eugene, just west of Pacific Highway (I-5). Traffic volumes are growing within the city of Creswell. In the year 1990, the population inside the Urban Growth Boundary (UGB) of Creswell was estimated at 3,130. Lane County has estimated the population to 5,400 by the year 2015. This is a 73 percent increase.

The project goal is to "improve the safety and operation of the interchange and the surrounding state highway transportation system and arterial system, while maintaining the system hierarchy of interstates, state roads, collectors and local streets". Here is a list of the issues addressed in this refinement plan:

- The Creswell/I-5 over-crossing structure has design, operation and safety deficiencies.
- The geometry of both freeway ramp terminals needs improvement.
- Safety concerns at the southbound freeway ramp terminal and the adjacent KOA access.
- Safety and design concerns at the two intersections of Goshen-Divide Highway and Oregon Avenue. A "jog" in the intersection is required because Goshen-Divide Highway swaps sides of the railroad at this intersection.
- Access improvements on Oregon Avenue.

The Creswell Citizen Advisory Committee (CAC) considered a "No Build" Concept plus five "Build" Concepts. The "Build" Concepts included:

- A new Springfield-Creswell Highway structure over the freeway.
- Improvements to the freeway ramps.
- Melton Road realigned to a new location approximately 150 meters (500 feet) east of the northbound freeway ramp terminals.
- Improvements to the Goshen-Divide Highway/Oregon Ave. intersections.

The Creswell CAC chose Concept 1A as the preferred alternative because it best satisfies the goals, objectives and design criteria for the project. Concept 1A includes:

- **A new Springfield-Creswell Highway structure over the freeway.**
  The southbound freeway ramps terminals relocated approximately 70 meters (230 feet) to the east.
- The southbound freeway loop on-ramp replaced with a conventional diamond leg interchange on-ramp.

- The "free right" at the southbound freeway ramp terminal removed.
- Melton Road realigned to a new location approximately 150 meters (500 feet) east of the northbound freeway ramp terminals.
- A grade separated crossing over the railroad connecting Mill Street to the portion of Goshen-Divide Highway that is located north of Market Road and south of Oregon Avenue.
- The "at-grade" railroad crossing on Oregon Avenue.

Concept 1A provides significant operational benefits by both improving the interchange and by adding an additional eastbound and westbound lane on the portion of Oregon Avenue that is located between the interchange and Front Street.

INTRODUCTION

The goal of this refinement plan is to "improve the safety and operation of the interchange and the surrounding state highway transportation system and arterial system, while maintaining the system and hierarchy of interstates, state roads, collectors and local streets". The objectives are to:

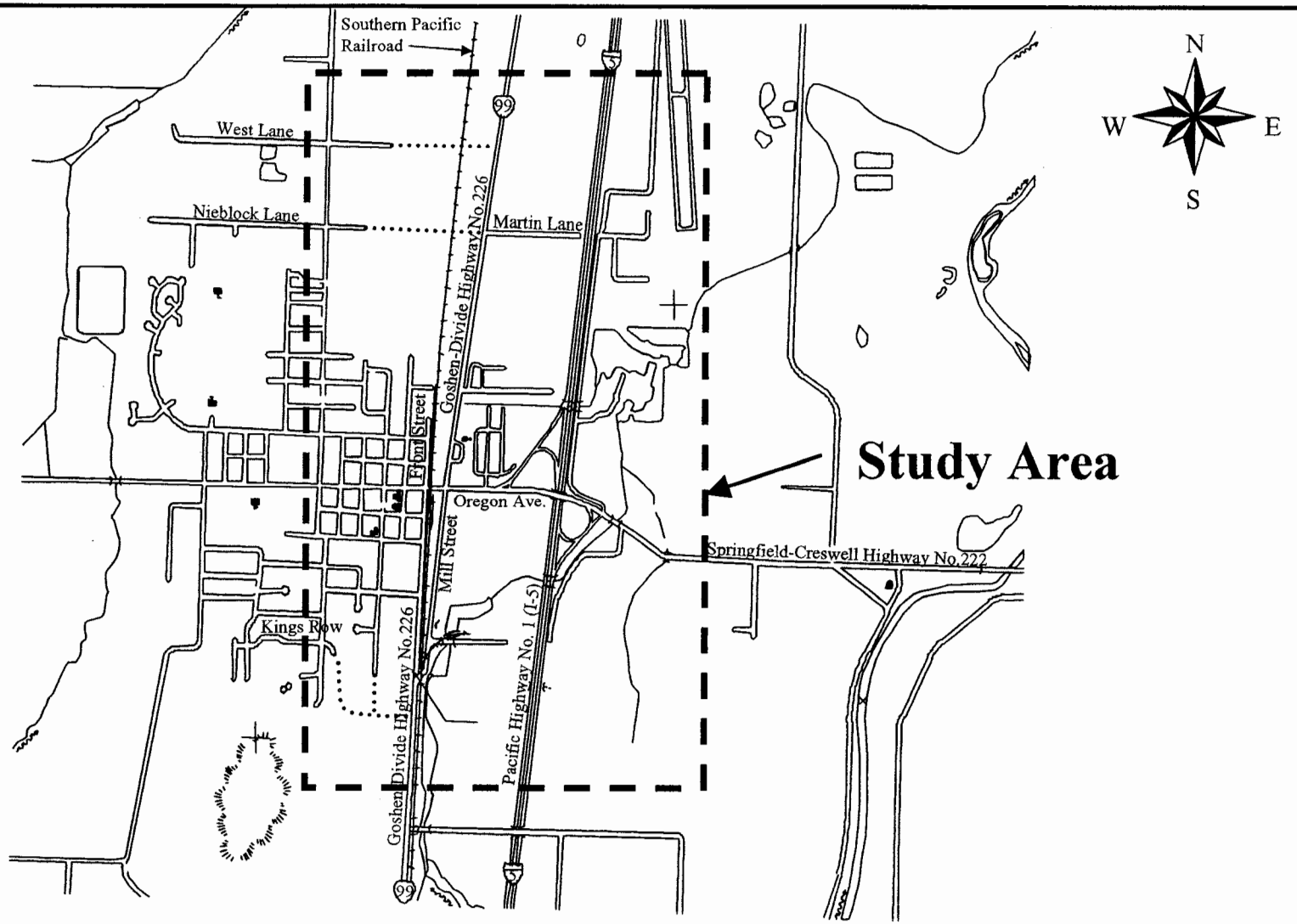
- Conform to ODOT policies and performance guidelines in the Transportation Planning Rule, the Oregon Highway Plan and the Oregon Transportation Plan.
- Coordinate the alternative with the goals and policies of the Creswell Transportation System Plan.
- Create an alternative that achieves the aesthetic goals for maintaining the historic scale and pattern of Creswell.
- Develop a multi-modal alternative that optimizes safety and mobility while providing reasonable access.
- Create an alternative that is fiscally constrained and built in phases.
- Coordinate with the Creswell TSP to develop an access management plan for the Springfield-Creswell Highway that resembles the features listed under Access Management Category #5 in the Oregon Highway Plan (OHP)
- Optimize the safety and operation of the Creswell Interchange at I-5 through the design of the interchange elements and through access control measures around the interchange.
- Investigate the possible solutions at the Highway 99/Oregon Ave. intersection.

The design criteria is to:

1) Achieve Level of Service (LOS) B on Mainline (I-5), LOS C for ramp merges and diverges on I-5, LOS C for ramp terminals and LOS D along the Springfield Creswell Highway. LOS are for a 2015 design year.
2) Project should be built in phases and phases should be fundable.
3) Concept should accommodate all users of facility (trucks, autos, transit, bikes, pedestrians).
4) Full build-out of the interchange should incorporate the construction of a new structure.
5) Avoid significant environmental impacts.

The complete project background, goals, objectives and design criteria can be found in Appendix A.

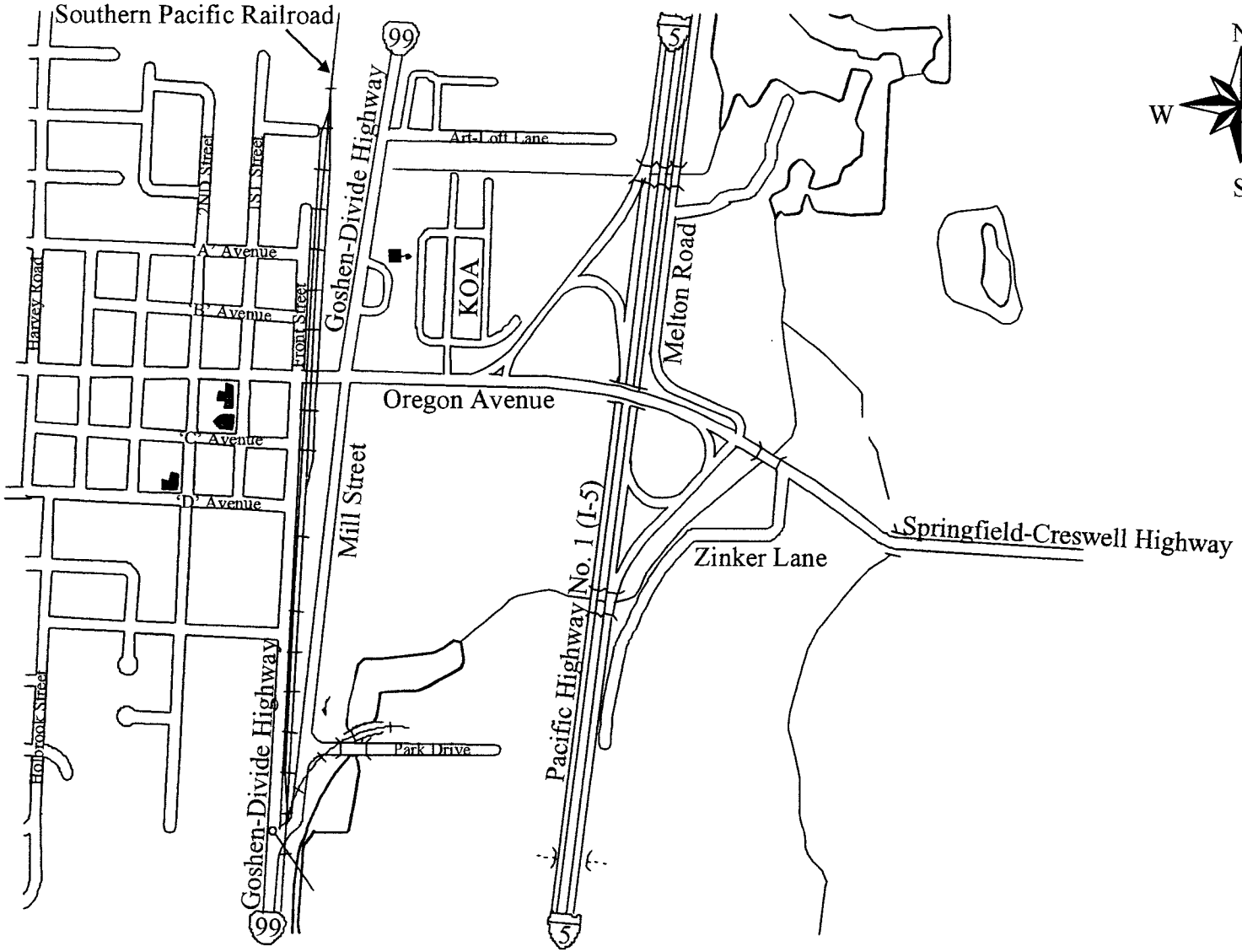
This refinement plan study area (see Figures 1 and 2) was expanded to include both the Creswell I-5 Interchange and the portion of Oregon Avenue that is located between the interchange and Front Street. The expanded study area was at the request of the Creswell CAC. The expansion was due to the portion of Oregon Avenue located between the interchange and Front Street requires an additional lane in both eastbound and westbound directions. This section of roadway includes the two intersections of Oregon Avenue that is formed by the



City of Creswell, Oregon

OREGON DEPARTMENT OF TRANSPORTATION TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Interchange Refinement Plan	**File : Creswell~1.PPT**	**Prepared By: Harlan Nale**	FIGURE 1
	Date : 11/21/97	**Reviewed By: Brian Dunn**	



OREGON DEPARTMENT OF TRANSPORTATION TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Interchange Refinement Study	**File : Creswell~1.PPT**	**Prepared By: Harlan Nale**	FIGURE 2
	Date : 11/24/97	**Reviewed By: Brian Dunn**	

"jog" of Goshen-Divide Highway. ODOT staff also investigated and proposed solutions that would resolve operational and safety issues associated with the existing at-grade railroad crossing on Oregon Avenue.

Issues addressed in this refinement plan included:

- The Creswell/I-5 over-crossing structure has design, operation and safety deficiencies.
- The geometry of both freeway ramp terminals needs improvement.
- Safety concerns at the southbound freeway ramp terminal and the adjacent KOA access.
- Safety and design concerns at the two intersections of Goshen-Divide Highway and Oregon Avenue. A "jog" in the intersection is required because Goshen-Divide Highway swaps sides of the railroad at this intersection.
- Access improvements on Oregon Avenue.

The Creswell Citizen Advisory Committee (CAC) considered a "No Build" Concept plus five "Build" Concepts. The "Build" Concepts were:

Both Concepts 1 and 2 will have the same interchange design.

- A new Springfield-Creswell Highway structure over the freeway.
- The southbound freeway ramps terminals relocated approximately 46 meters (150 feet) to the east.
- The "free right" at the southbound freeway ramp terminal removed.
- Melton Road realigned to a new location approximately 150 meters (500 feet) east of the northbound freeway ramp terminals.

Concept 1

- Realigns the northern portion of Goshen-Divide Highway to form a "T" with Oregon Avenue approximately 93 meters (305 feet) east of the existing location.

Concept 2

- Realigns the northern portion of Goshen-Divide Highway to form a "T" with Oregon Avenue approximately 20 meters (65 feet) east of the existing location.

Through the Creswell CAC selection process, Concepts 1 and 2 were presented, discussed and eventually eliminated as viable concepts. After revisions were made, Concept 1 became Concept 1A. Concept 2, also going through revisions, retained its title as Concept 2. Concept 3, developed during these revisions, remains a viable concept.

Build Concepts 1A, 2 and 3 will have the same interchange design.

- A new Springfield-Creswell Highway structure over the freeway.

- The southbound freeway ramps terminals relocated approximately 70 meters (230 feet) to the east.
- The southbound freeway loop on-ramp replaced with a conventional diamond leg interchange on-ramp.
- The "free right" at the southbound freeway ramp terminal removed.
- Melton Road realigned to a new location approximately 150 meters (500 feet) east of the northbound freeway ramp terminals.

Concept 1A

- Provides a grade separated crossing over the railroad connecting Mill Street to the portion of Goshen-Divide Highway that is located north of Market Road and south of Oregon Avenue.
- Maintains the "at-grade" railroad crossing on Oregon Avenue.

Concept 2

- Depresses the railroad under Oregon Avenue.
- Realigns the portion of Goshen-Divide Highway that is located north of Oregon Avenue to the west to intersect the northern portion of Front Street.
- Moves the existing traffic signal at the Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection to the adjacent intersection that is located approximately 80 meters (260) feet to the west.
- Removes the "at-grade" railroad crossing on Oregon Avenue.

Concept 3

- Realigns the portion of Goshen-Divide Highway that is located north of Oregon Avenue to the west to intersect the northern portion of Front Street.
- Utilizes the "at-grade" railroad crossing on Harvey Road to realign the northern portion of Goshen-Divide Highway.
- Moves the existing traffic signal at the Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection to the adjacent intersection that is located approximately 80 meters (260) feet to the west.
  Maintains the "at-grade" railroad crossing on Oregon Avenue.

TRAFFIC DEVELOPMENT

BASE TRAFFIC

The base year (1996) Average Daily Traffic (ADT) and Design Hour Volumes (DHV) were determined using manual and hose counts that were collected in the vicinity. The DHV are approximately equal to the summer P.M. Peak Hour traffic volumes. The ADT (Average Daily Traffic) shown has been adjusted seasonally to reflect AADT (Average Annual Daily Traffic) for an average day. Figure 3 shows Year 1996 Traffic Volumes and analytic results for the existing transportation facility.

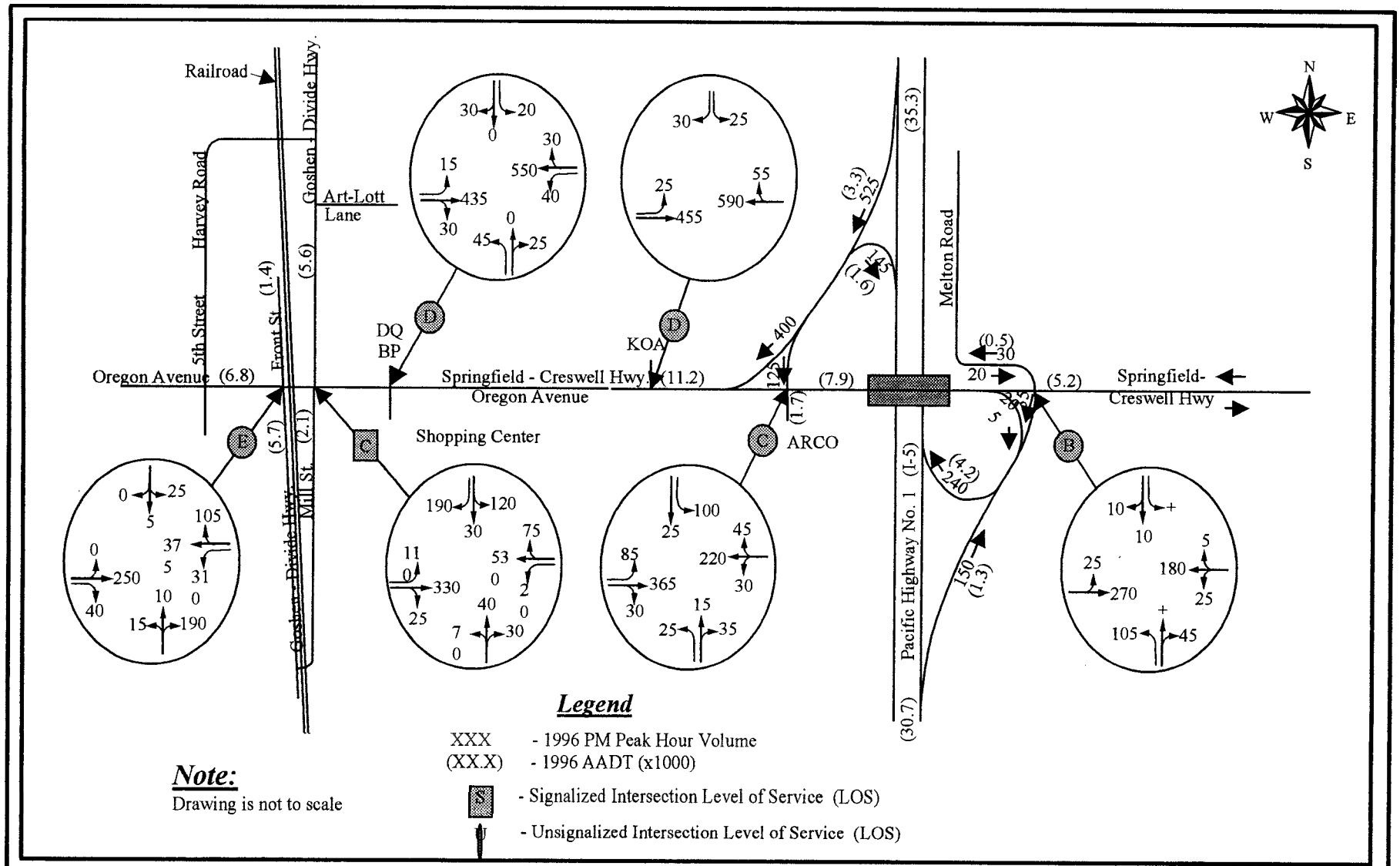
Table 1 shows the manual count classification locations and Table 2 shows the hose count locations.

Table 1 - Manual Classification Count Locations

Main Street	Cross Street	Counted:	Duration:	By:
Springfield-Creswell Highway	I-5 Northbound Ramps & Melton Rd.	7/96	14 hour	ODOT
Oregon Avenue	I-5 Southbound Ramps & Driveway	7/96	14 hour	ODOT
Oregon Avenue	I-5 Southbound Ramps & Driveway	4/97	3 hour	ODOT
Mill Street & Goshen-Divide Highway	Oregon Avenue	4/97	3 hour	ODOT
Front Street & Goshen-Divide Highway	Oregon Avenue	9/93	16 hour	ODOT
IST Street	Oregon Avenue	9/97	4 hour	Charbon-neau Eng
Front Street & Goshen-Divide Highway	Oregon Avenue	5/97	1 hour	ODOT

Table 2 - Hose Count Locations

Location	Counted:	Duration:	By:
KOA Entrance	8/96	48	ODOT
Oregon Avenue – East of Mill Street	8/96	48	ODOT
Oregon Avenue – West of Mill Street	8/96	48	ODOT
Goshen-Divide Highway– North of Oregon Avenue	8/96	48	ODOT
Mill Street – South of Oregon Avenue	8/96	48	ODOT



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, No Build Option - No TSP Extensions **1996 Design Hour Volumes**	FILE : Creswell~2.PPT	Prepared By: Harlan Nale	FIGURE 3
	DATE : 12/18/97	Reviewed By: Brian Dunn	

FUTURE TRAFFIC

Future year traffic projections are typically performed through the use of cumulative analysis, historical growth trends or transportation models. The method used in an area depends on the type and availability of information. At the time of this analysis, the best available information was a transportation model of the City of Creswell, historical growth trends on the freeway, and Lane County zoning information.

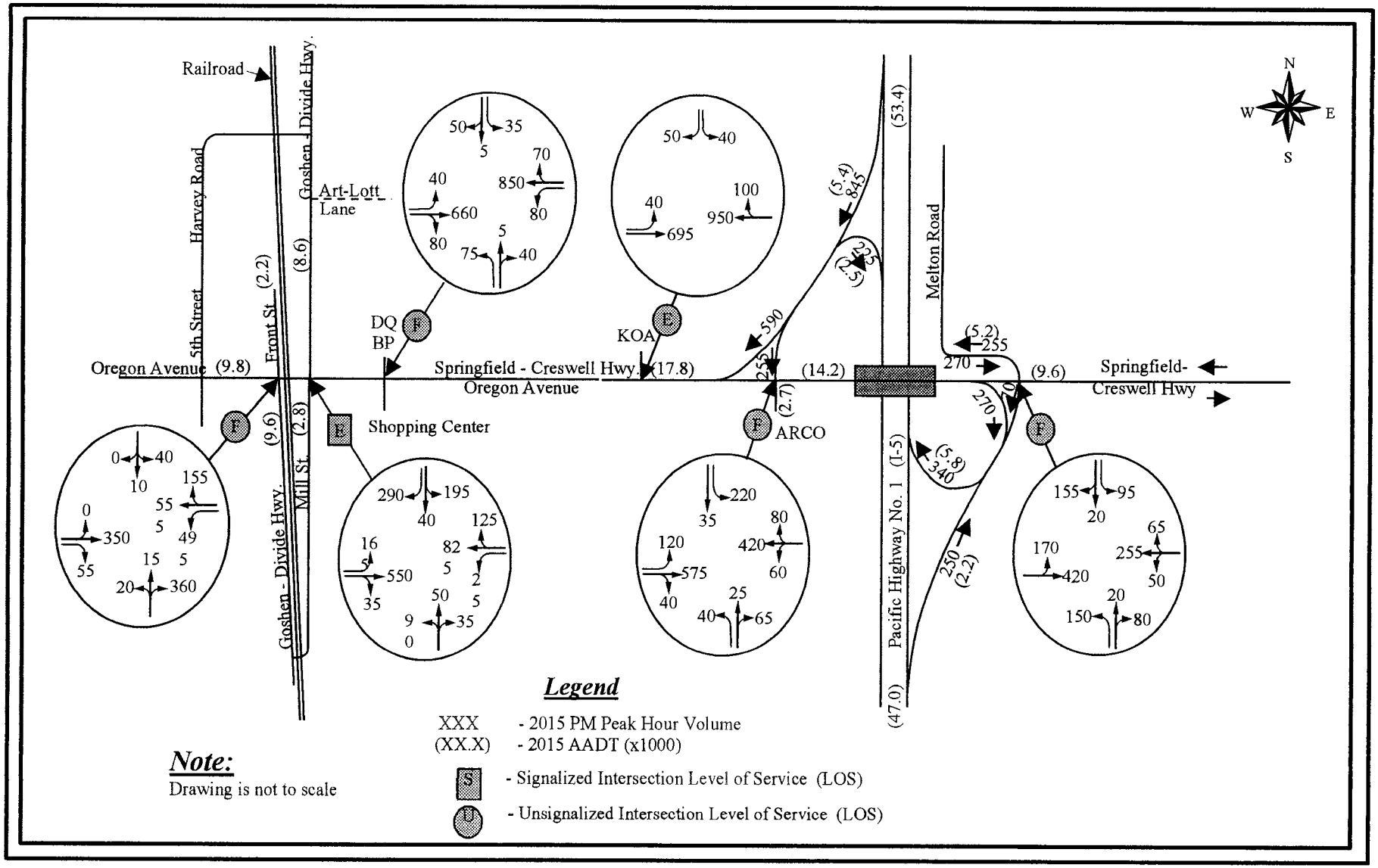
Lane County Council of Governments (LCOG) has developed an EMME/2 transportation model for the City of Creswell. The model uses population and employment information within the Creswell Urban Growth Boundary (UGB) and Lane County to determine base (1995) and future (2015) ADT volumes. Future traffic volumes within the model area were developed using LCOG's EMME/2 model of Creswell and methodologies consistent with NCHRP Report 255. Figure 4 shows both Year 2015 Traffic Volumes and analytic results for the existing transportation facility.

ANALYSIS METHODOLOGIES

The levels of service (LOS) for the ramp terminals and intersections along Oregon Avenue were analyzed using SIGCAP2, an Oregon Department of Transportation (ODOT) computerized analysis program that is based on critical movement analysis. The signalized intersection LOS is a quantitative measure of the ratio between the existing or projected volumes, to the capacity of the roadway at a given location. This ratio is known as Volume to Capacity (V/C). The V/C ratios are broken down into six levels and each is given a letter designation, from A through F, for identification purposes. The LOS designation of "A" represents the best LOS while "F" represents the worst. See Appendix B for signalized LOS designation.

The storage lengths required at the signalized intersections are provided by SIGCAP2 and are consistent with the methodologies found in National Cooperative Highway Research Project (NCHRP) Report 348, "Access Management Guidelines for Activity Centers." The storage distance is an estimation of the queue of vehicles stopped at a signalized intersection during the "red" phase. This distance is of great importance because it will show the interaction between the signal and other intersections or driveways in the vicinity.

The design hourly volumes at unsignalized intersections were analyzed using UNSIG10. This is an ODOT computerized program that uses reserve capacity of a lane to determine a LOS. The reserve capacity is equal to the capacity of a lane at an unsignalized intersection minus the demand volume for that lane. The reserve capacities are broken into six levels and each is given a letter designation, form A through F, for identification purposes. The level of service designation



TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, No Build Option - No TSP Extensions **2015 Design Hour Volumes**	**FILE : Creswell-2.PPT**	**Prepared By: Harlan Nale**	FIGURE 4
	DATE : 12/18/97	**Reviewed By: Brian Dunn**	

"A" represents the best while "F" is the worst. These levels of service only apply to traffic flows that must either stop or yield at an unsignalized intersection. Left-turns from the mainline and all side-street traffic is effected. The through traffic on the mainline is generally unaffected, until the other movements approach capacity and create a safety concern. See Appendix C for unsignalized LOS designation.

The levels of service for the ramp connections were analyzed using Chapter 5, *Ramps and Ramp Junctions* of the 1994 Transportation Research Board, Special Report 209, "Highway Capacity Manual" (HCM).

The Transportation Planning Analysis Unit (TPAU) uses Signal Warrant 1 (Minimum Vehicular Traffic) and Warrant 2 (Interruption of Continuous Traffic) from the Manual on Uniform Traffic Control Devices (MUTCD) for a preliminary signal warrant analysis. These warrants deal primarily with high volumes on the intersecting minor street, and high volumes on the major street. Meeting preliminary signal warrants does not guarantee that a signal will be installed. Before a signal can be installed a field warrant analysis will be conducted by Region. If warrants are met, the ODOT Traffic Management Section will make the final decision on the installation of a signal on the State Highway System.

The minimum Level of Service standards (refer to Oregon Highway Plan) for this analysis are listed in the goals and objectives (See Appendix A). These standards are LOS B for the freeway, LOS C for the ramp terminals and LOS D for the city intersections.

NO-BUILD

EXISTING

As indicated earlier, Figure 2 shows a scaled "blow-up" of Creswell/I-5 Interchange along with the portion of Oregon Avenue that is involved in this refinement study. This schematic shows a broad view of the existing geometry for the study area. The Creswell/I-5 over-crossing structure and Oregon Avenue have design, operation, and safety deficiencies. Deficiencies for the Creswel/I-5 over-crossing structure include:

- Sight distances at both freeway ramp terminals are at minimum tolerable levels.
- The approximate 5 percent grades on both approaches of the structure can cause slow acceleration speeds for trucks turning west from the northbound freeway ramp terminal.
- The structure is very narrow. This does not encourage pedestrian and bicycle use.
- The Southbound off-ramp occasionally "backs-up" to I-5.
- The guardrail off the end of the I-5 structure may be a visual obstruction to drivers at the freeway ramp terminals.

Design, operational and safety deficiency for the portion of Oregon Avenue that is located within the study area include:

- Melton Road is located "straight-across" from the northbound freeway ramps.
- The southbound freeway off-ramp is located too close to the KOA access. The southbound "free-flow" right turn from the freeway off-ramp can interfere with the operation of the KOA access.
- There is an access located "straight-across" from the southbound freeway ramp terminal.
- There are too many accesses along Oregon Avenue increasing conflict points and the potential for accidents. This can both confuse drivers and cause congestion at times.
- There is no local connectivity for the portion of Oregon Avenue that is located between the railroad tracks and the Creswell/I-5 Interchange.
- The two intersections on Oregon Avenue that is formed by the "jog" of Goshen-Divide Highway are located too close to each other and have railroad tracks located between them.
- Traffic must cross the railroad tracks along Oregon Avenue at-grade. This is a safety concern.

FUTURE

Both residential and commercial development will increase traffic flows within the City of Creswell. Traffic on the portion of Oregon Avenue that is located between Goshen-Divide Highway and Creswell/I-5 Interchange will increase by approximately 58 percent between the years 1996 and 2015. Traffic on Oregon Avenue west of Front Street will increase by approximately 44 percent. The northern portion of Goshen-Divide Highway will increase by approximately 55 percent while the southern portion will increase by approximately 67 percent. The highest growth rate is located on Springfield-Creswell Highway just east of Creswell/I-5 Interchange. The anticipated commercial development in this area should double traffic flow volumes by the year 2015.

In 1990, the population inside the UGB was estimated to be 3,130, approximately 700 persons were residing outside the city limits. Population in the Creswell UGB is expected to reach 5,400 persons by the year 2015. This growth rate yields a 55 percent increase of population between the years 1996 and 2015.

The Transportation System Plan (TSP) for the City of Creswell extends Kings Row and extends either West Lane or Nieblock Lane easterly to Goshen-Divide Highway. The initial EMME/2 transportation model for the City of Creswell did not include the future extensions of West Lane, Nieblock Lane and Kings Row easterly to Goshen-Divide Highway. For that reason, the EMME/2 transportation model for the City of Creswell was revised to include the effects of the proposed extensions. In September 1997, Lane County staff indicated that either West Lane or Nieblock Lane may be extended easterly to Goshen-Divide Highway.

Figure 5 shows both Year 2015 Traffic Volumes and analytic results including the proposed extensions.

The effect of the proposed extensions does not change the projected traffic volumes on the portion of Oregon Avenue that is located between Mill Street and the Creswell/I-5 Interchange. In the year 2015, the effects of these extensions will lower traffic volumes on the portion of Oregon Avenue located west of Front Street by approximately a third. The northern portion of Goshen-Divide Highway will grow by approximately 9 percent while the southern portion will be reduced by approximately 15 percent.

ANALYSIS RESULTS

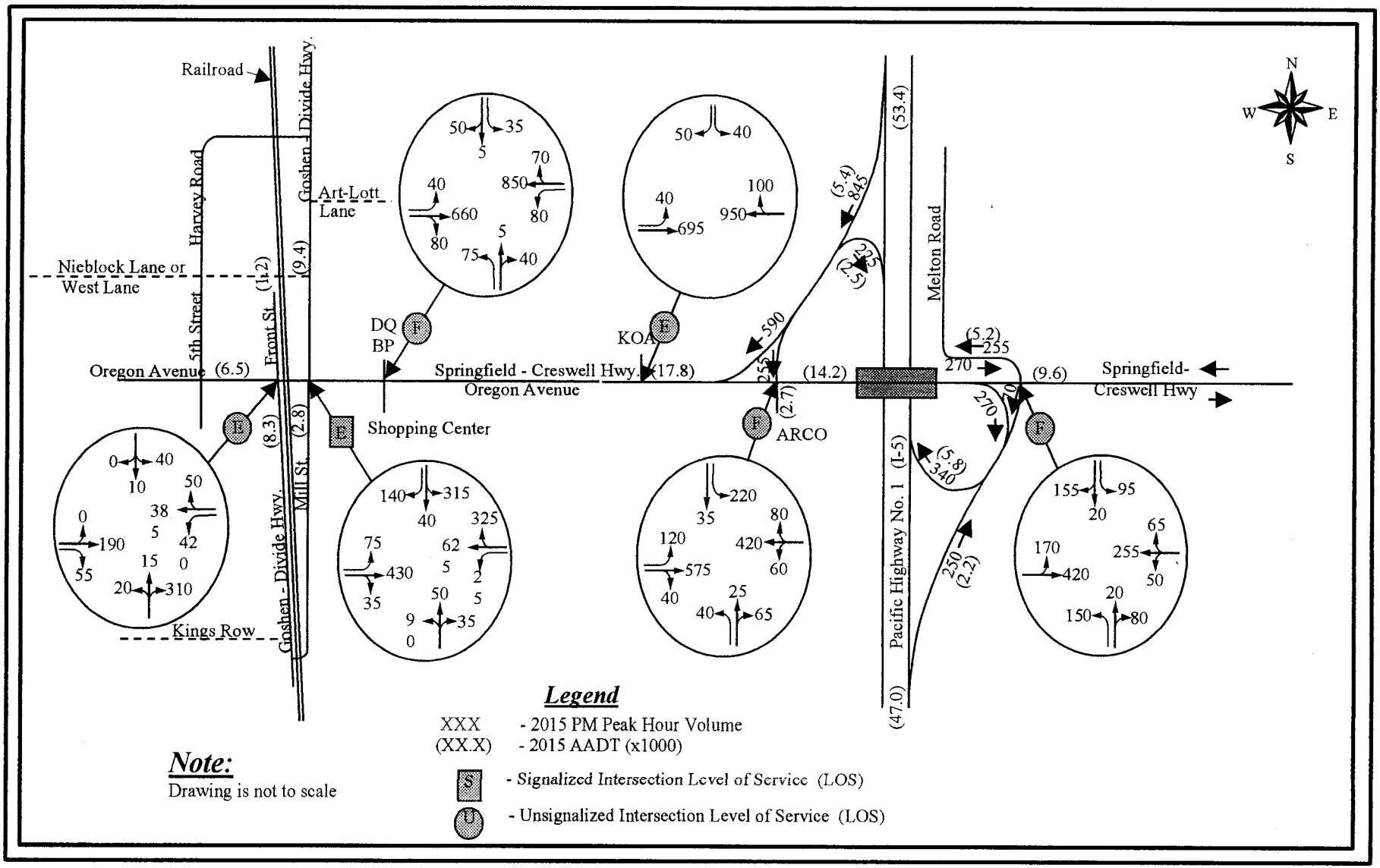
The analytic results for the years 1996 and 2015 for the No-Build Option are shown in Figure 3, Figure 4, and in the following table:

Table 3 – Years 1996 and 2015 Levels of Service (LOS) for No-Build Option – Without Future Extensions

Intersection	No-Build (Without Future Extensions)			
	Unsignalized		Signalized	
	1996	2015	1996	2015
Northbound Freeway Ramps/Melton Road at Springfield-Creswell Highway	B	F	----	----
Southbound Freeway Ramps/Arco Station Access at Oregon Avenue	C	F	----	----
KOA Access at Oregon Avenue	D	E*	----	----
BP Station/Shopping Center Accesses at Oregon Avenue	D	F	----	----
Goshen-Divide Highway/Mill Street at Oregon Avenue	----	----	C	E
Front Street/Goshen-Divide Highway at Oregon Avenue	E	F*	----	----

*The LOS shown in this table assumes that traffic queues from adjacent intersections do not cause adverse effects on intersection operation. If traffic queues from a "closely-spaced" intersection blocks the operation of the intersection that is being analyzed, the resulting LOS will probably be LOS F in lieu of the LOS that is reported in this table.

Table 3 does not include the effect of the proposed extensions of Kings Row and either West Lane or Nieblock Lane. Future traffic volumes cause four of the unsignalized intersections to drop to an unacceptable LOS F. The LOS for both



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, No Build Option - Includes TSP Extensions 2015 Design Hour Volumes	**FILE : Creswell-2.PPT**	**Prepared By: Harlan Nale**	FIGURE 5
	DATE : 12/18/97	**Reviewed By: Brian Dunn**	

northbound and southbound freeway ramp terminals could be improved by installing traffic signals, however, both of these freeway ramps are geometrically unacceptable and would have to be modified before traffic signals could be installed.

Interstate 5 is the major roadway in this vicinity and the ramps must function properly to insure a well operating system. Under the No-Build Option, in the year 2015, both the freeway and ramp merge and diverge points will operate at LOS D whether or not the interchange is rebuilt.

Table 4 compares the Year 2015 LOS for the No-Build Option with and without the proposed extensions of Kings Row and either West Lane or Nieblock Lane:

Table 4 – Comparing Year 2015 Levels of Service (LOS) for No-Build Option with and without Extensions

Intersection	No-Build (Year 2015)			
	Unsignalized		Signalized	
	No Ex-tensions	w/Ex-tensions	No Ex-tensions	w/Ex-tensions
Northbound Freeway Ramps/Melton Road at Springfield-Creswell Highway	F	F	----	----
Southbound Freeway Ramps/Arco Station Access at Oregon Avenue	F	F	----	----
KOA Access at Oregon Avenue	E*	E*	----	----
BP Station/Shopping Center Accesses at Oregon Avenue	F	F	----	----
Goshen-Divide Highway/Mill Street at Oregon Avenue	----	----	E	E
Front Street/Goshen-Divide Highway at Oregon Avenue	F*	E*	----	----

* The LOS shown in this table assumes that traffic queues from adjacent intersections do not cause adverse effects on intersection operation. If traffic queues from a "closely-spaced" intersection blocks the operation of the intersection that is being analyzed, the resulting LOS will probably be LOS F in lieu of the LOS that is reported in this table.

The proposed extensions will improve the unsignalized intersection of Front Street/Goshen-Divide Highway at Oregon Avenue from LOS F to LOS E. This improvement in LOS is due to the reduction of traffic flows on the portion of Oregon Avenue that is located west of Front Street.

SIGNAL WARRANTS AT CRESWELL/I-5 INTERCHANGE

Preliminary ADT Traffic Signal Warrants were met at both northbound and southbound freeway ramp terminals before the design year (year 2015). Table 5 shows both the intersection and the approximate year projected for meeting the signal warrant.

Table 5 - Signal Warrants

Intersection	Warrant 1			Warrant 2		
	1996	2015	Year Met	1996	2015	Year Met
Northbound Ramp Terminal @ Springfield-Creswell Highway	No	No	----	No	Yes*	2013
Southbound Ramp Terminal @ Oregon Avenue	No	Yes*	1999	No	Yes*	2011

*Meeting a preliminary signal warrant is NOT a mandate to install a signal, it is a guideline to alert staff to the possibility of a signal being needed at a certain location.

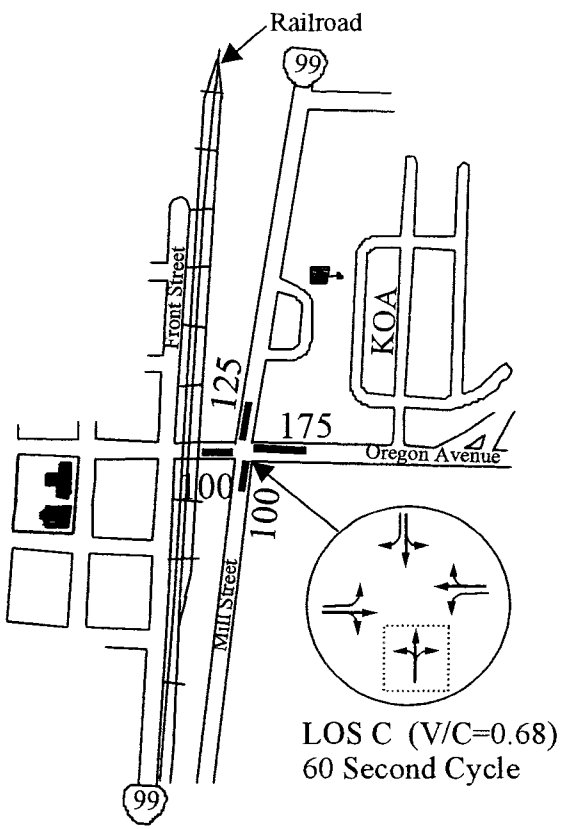
PROGRESSION

Any transportation system that employs a series of signals within close proximity to one another needs to be analyzed for progression. Progression is the ability to get the majority of vehicles to move along a particular route by timing the signals so they change to green as approaching vehicles arrive. Progression was not analyzed because it is a refinement project. When this project reaches the Project Development phase, signal progression will be analyzed.

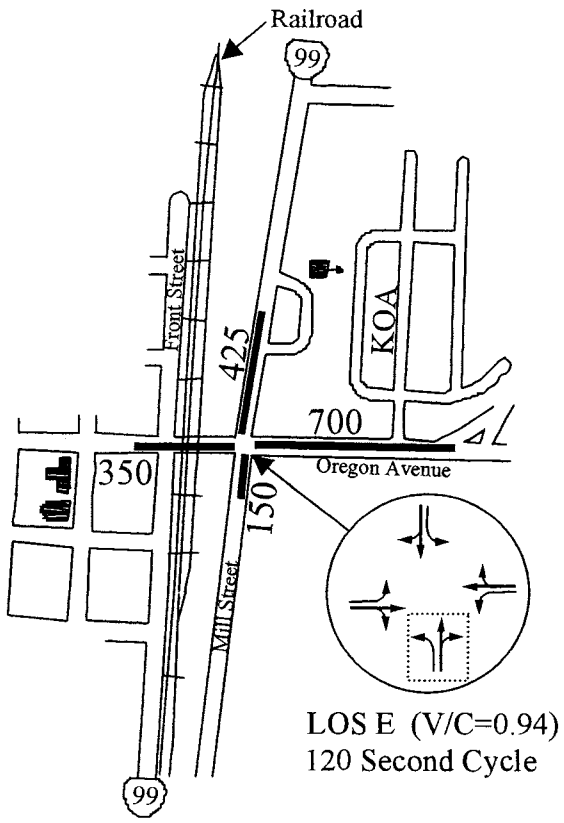
STORAGE DISTANCES

Storage distance is an important issue when it comes to the No-Build Option. Figure 6 shows the storage distance requirements at the Goshen-Divide Highway/Mill Street intersection for the Years 1996 and 2015. In the year 1996, the traffic signal at Goshen-Divide Highway/Mill Street at Oregon Avenue operated at LOS C using a 60-second cycle length. Approximately 100 feet of storage distance is required for vehicles traveling eastbound on Oregon Avenue. There is enough storage distance between the railroad tracks and Goshen-Divide Highway/Mill Street so that vehicles will not stop on the railroad tracks while the traffic signal stops eastbound Oregon Avenue traffic flows.

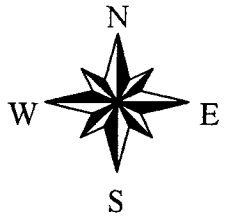
In the year 2015, an updated traffic signal at the Goshen-Divide Highway/Mill Street at Oregon Avenue intersection will operate at an unacceptable LOS E. The south approach will require a separate left turn lane. Future traffic volumes will be heavy enough to require that left turn protection be included at all four of the intersection approaches. This left turn protection will provide a "green left turn arrow" to allow drivers to turn left safely. The cycle length of the updated traffic signal will need to be increased from the existing 60-second cycle to a 120-second cycle to provide enough green time for the drivers turning left. Longer cycle lengths cause more delay, which in turn cause storage distances to increase. Using both the updated lane configurations on Mill Street and future cycle length:



Year 1996
Storage Distances (Feet)
(No Extensions)



Year 2015
Storage Distances (Feet)
(With Extensions)



OREGON DEPARTMENT OF TRANSPORTATION TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, No Build Option **Storage Distances for Years 1996 and 2015**	**File : Creswell~1.PPT** **Date : 11/25/97**	**Prepared By: Harlan Nale** **Reviewed By: Brian Dunn**	FIGURE 6

- Eastbound Oregon Avenue traffic will "stack' approximately 350 feet. This "stacking" will extend west of the railroad tracks and through the Front Street/Goshen-Divide Highway at Oregon Avenue intersection. Vehicles could be stopped on the railroad tracks and the unsignalized intersection of Front Street/Goshen-Divide Highway at Oregon Avenue will be "blocked" by these "stacked" vehicles.
- Westbound vehicles on Oregon Avenue will be "stacked" approximately 700 feet. This will block accesses to such businesses as the Shopping Center, the Dairy Queen, the BP Station, and the KOA Campground. It will also block the "free right" from the Southbound I-5 Freeway Ramps, which may cause the Southbound Freeway Ramps to "back-up" onto the freeway. Southbound traffic on Goshen-Divide Highway will require 425 feet of storage distance.
- 150 feet of storage distance will be required for northbound traffic flows on Mill Street. The northbound traffic flows will "block" the access from Mill Street to the Shopping Center.

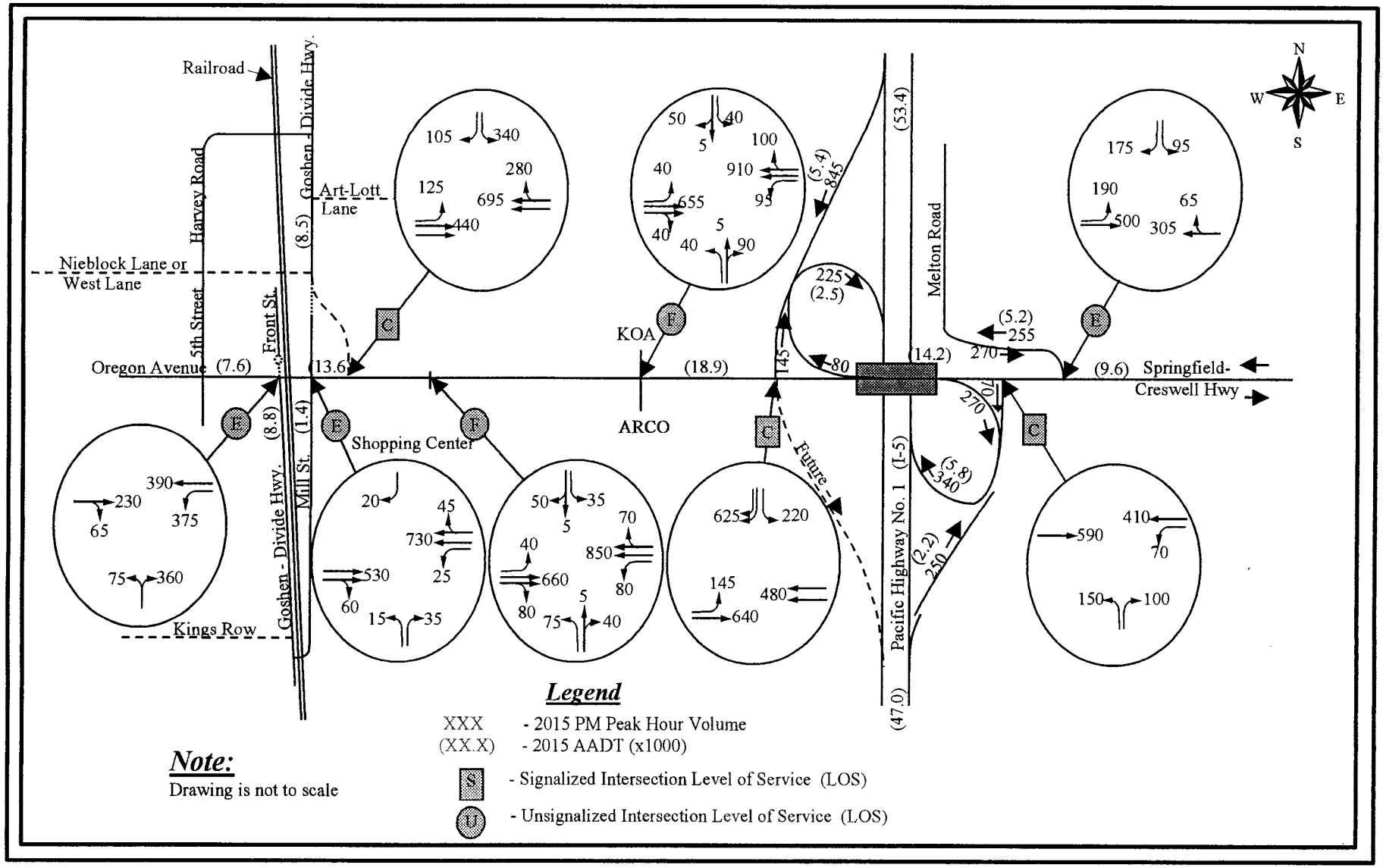
BUILD ALTERNATIVES – PRESENTED AT THE CRESWELL OPEN HOUSE ON APRIL 28, 1997

Two build concepts were presented along with the "No-Build Concept" at the Creswell Open House on April 28, 1997. Since then, three more build concepts have been proposed and have been presented to the Creswell CAC for consideration.

Figures 7 and 8 show Year 2015 Traffic Volumes, LOS and lane configurations for the two build concepts that were presented to the Creswell CAC on April 28, 1997. The Creswell/I-5 Interchange is redesigned the same way for both Concepts 1 and 2. The design includes:

A new Springfield-Creswell Highway structure over the freeway. This proposed structure will be constructed wider to accommodate both pedestrians and bicycles. The grade of the new structure will be reduced at both of the bridge ends so that sight distance can be increased.

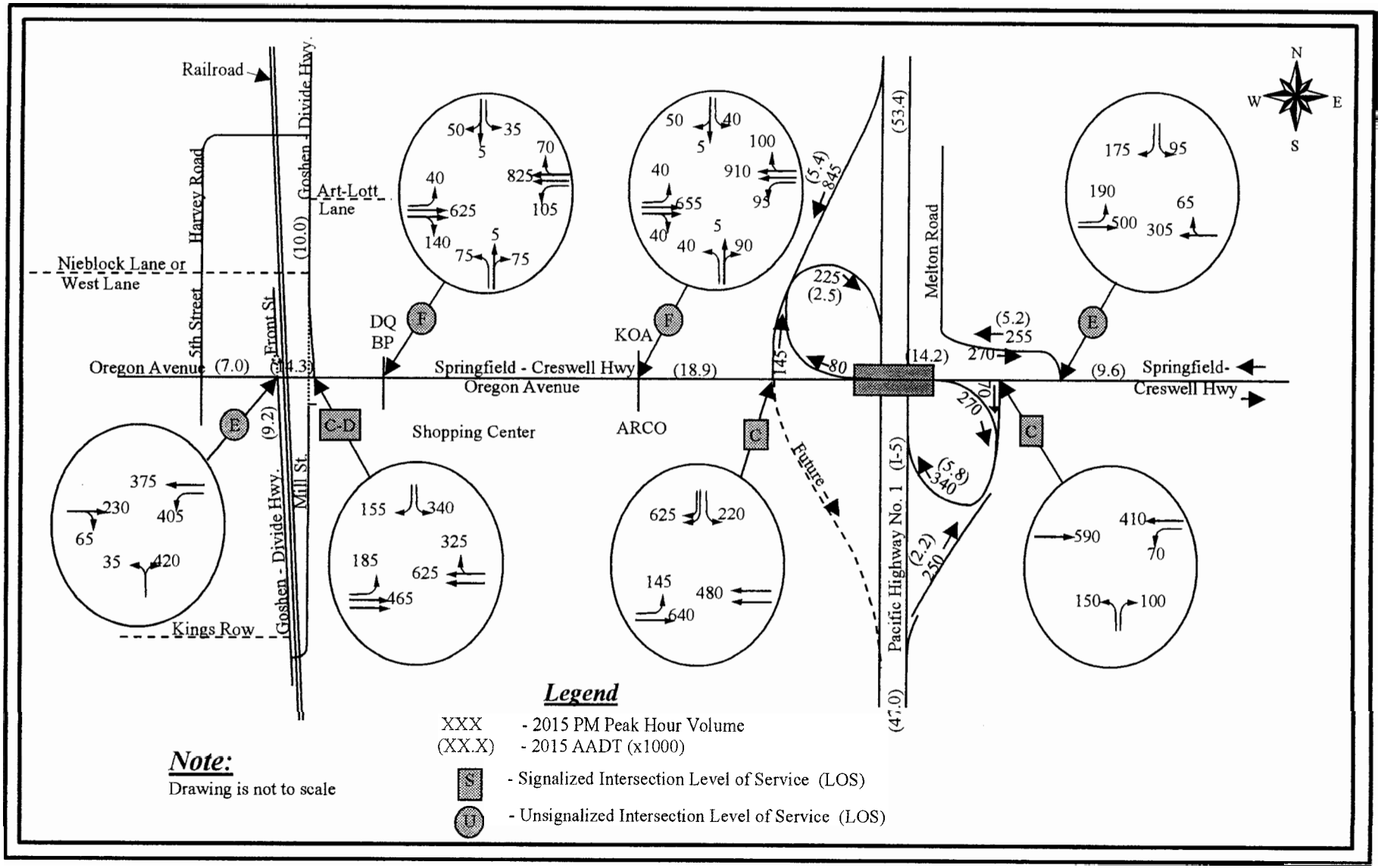
- The southbound freeway loop ramp is relocated approximately 46 meters (150 feet) to the east to increase the distance between the southbound freeway off-ramp and the KOA/ARCO accesses.
- Both northbound and southbound freeway ramp terminals will meet Preliminary ADT Traffic Signal Warrants before the year 2015.
- The "free right" at the southbound freeway off-ramp will be eliminated. This will improve safety at the KOA Access/Oregon Avenue Intersection. Vehicles turning from the southbound freeway off-ramp will have to travel through a traffic signal before proceeding westbound on Oregon Avenue. A dual right turn lane will be constructed on the north approach for vehicles turning west on Oregon Avenue.



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, Intersection Concept 1 - Includes TSP Extensions **2015 Design Hour Volumes (April 97 Open House)**	FILE : Creswell-2.PPT	Prepared By: Harlan Nale	FIGURE 7
	DATE : 11/26/97	Reviewed By: Brian Dunn	



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, Intersection Concept 2 - Includes TSP Extensions **2015 Design Hour Volumes (April 97 Open House)**	**FILE : Creswell-2.PPT**	**Prepared By: Harlan Nale**	FIGURE 8
	DATE : 12/11/97	**Reviewed By: Brian Dunn**	

- Preliminary plans indicate that the left turn for the eastbound to southbound traffic movement would be eliminated in the future and a new southbound freeway on-ramp be constructed in the southwest quadrant of Creswell/I-5 Interchange. Vehicles traveling eastbound on Oregon Avenue will turn right to enter this southbound freeway on-ramp in lieu of turning left to use the existing southbound freeway loop on-ramp.

  Melton Road will be realigned for both concepts to a new location approximately 150 meters (500 feet) east of the northbound freeway ramp terminal. A left turn lane will be installed for vehicles traveling eastbound on Springfield-Creswell Highway and turning left in order to travel north on Melton Road.
- Both Concepts 1 and 2 include an additional eastbound and westbound lane on Oregon Avenue between Creswell/I-5 Interchange and Front Street.

ADDITIONAL DESIGN FOR CONCEPT 1 INCLUDES:

Concept 1 (Figure 7) realigns the northern portion of Goshen-Divide Highway to form a "T" intersection with Oregon Avenue approximately 85 meters (250 feet) east of the existing location. The existing Goshen-Divide Highway traffic movement will be right in/out. There will be full access from Mill Street to Oregon Avenue. Front Street will be "cul-de-saced" just north of Oregon Avenue.

COST SUMMERY* – CONCEPT 1

Cost: $10.0 million

Construction Cost: $2.5 million (Oregon Avenue)
$7.5 million (Interchange)

*The cost estimates given were provided by the Preliminary Design Unit (PDU) in Salem. The estimates are reconnaissance-level estimates and include costs for roadway construction only. Right of way costs are not included.

ADDITIONAL DESIGN FOR CONCEPT 2 INCLUDES:

Concept 2 (Figure 8) realigns the northern portion of Goshen-Divide Highway to form a "T' intersection with Oregon Avenue approximately 20 meters (65 feet) east of the existing location. The northern portion of Mill Street is realigned to serve as an access to the Shopping Center in lieu of an access to Oregon Avenue. Like Concept 1, Front Street is "cul-de-saced" just north of Oregon Avenue.

COST SUMMARY* – CONCEPT 2

Cost: $10.0 million

Construction Cost: $2.5 million (Oregon Avenue)
$ 7.5 million (Interchange)

*The cost estimates given were provided by the Preliminary Design Unit (PDU) in Salem. The estimates are reconnaissance-level estimates and include costs for roadway construction only. Right of way costs are not included.

YEARS 2015 LEVELS OF SERVICE (LOS) FOR CONCEPTS 1 AND 2

Traffic analysis has been completed for both Concepts 1 and 2. These results are tabulated in Table 6:

Table 6 – Year 2015 Levels of Service (LOS) for Concepts 1 and 2 (Presented at Open House on April 28, 1997)

Intersection	Build Concepts (With Future Extensions)			
	Unsignalized		Signalized	
	Concept 1	Concept 2	Concept 1	Concept 2
Melton Road at Springfield-Creswell Highway	E	E	----	----
Northbound Freeway Ramps at Springfield-Creswell Highway	----	----	C	C
Southbound Freeway Ramps/Arco Station Access at Oregon Avenue	----	----	C	C
KOA Access at Oregon Avenue	F	F	----	----
BP Station/Shopping Center Accesses at Oregon Avenue	F	F	----	----
Realigned Goshen-Divide Highway Street at Oregon Avenue	----	----	C	C-D
Mill Street at Oregon Avenue	E	----	----	----
Southern Goshen-Divide Highway at Oregon Avenue	E	E	----	----

*The LOS shown in this table assumes that traffic queues from adjacent intersections do not cause adverse effects on intersection operation. If traffic queues from a "closely-spaced" intersection blocks the operation of the intersection that is being analyzed, the resulting LOS will probably be LOS F in lieu of the LOS that is reported in this table.

Both Concept 1 and Concept 2 maintain "full" access to the KOA Access from Oregon Avenue. Safety is improved at the KOA Access/Oregon Avenue Intersection by both eliminating the "free right" at the southbound freeway ramp terminal and by increasing the distance between the southbound freeway ramp terminals and the KOA Access/Oregon Avenue Intersection. Both concepts will stop vehicles on the southbound freeway off-ramp turning west onto Oregon Avenue. The existing "free right" could have remained if the KOA Access was either closed or was converted to a right in/out access.

The citizens at the Open House on April 28, 1997 were both concerned about the impacts concerning the two build concepts and about the internal circulation for businesses that are located along Oregon Avenue. Concept 1 (a major realignment of northern Goshen-Divide Highway) will have a major impact on some KOA mobile homes and Creswell Venda Car Wash. Concept 2 (a minor realignment of northern Goshen-Divide Highway) will remove the BP Station and have an impact on Mr. Macho's Pizza. There were suggestions made regarding

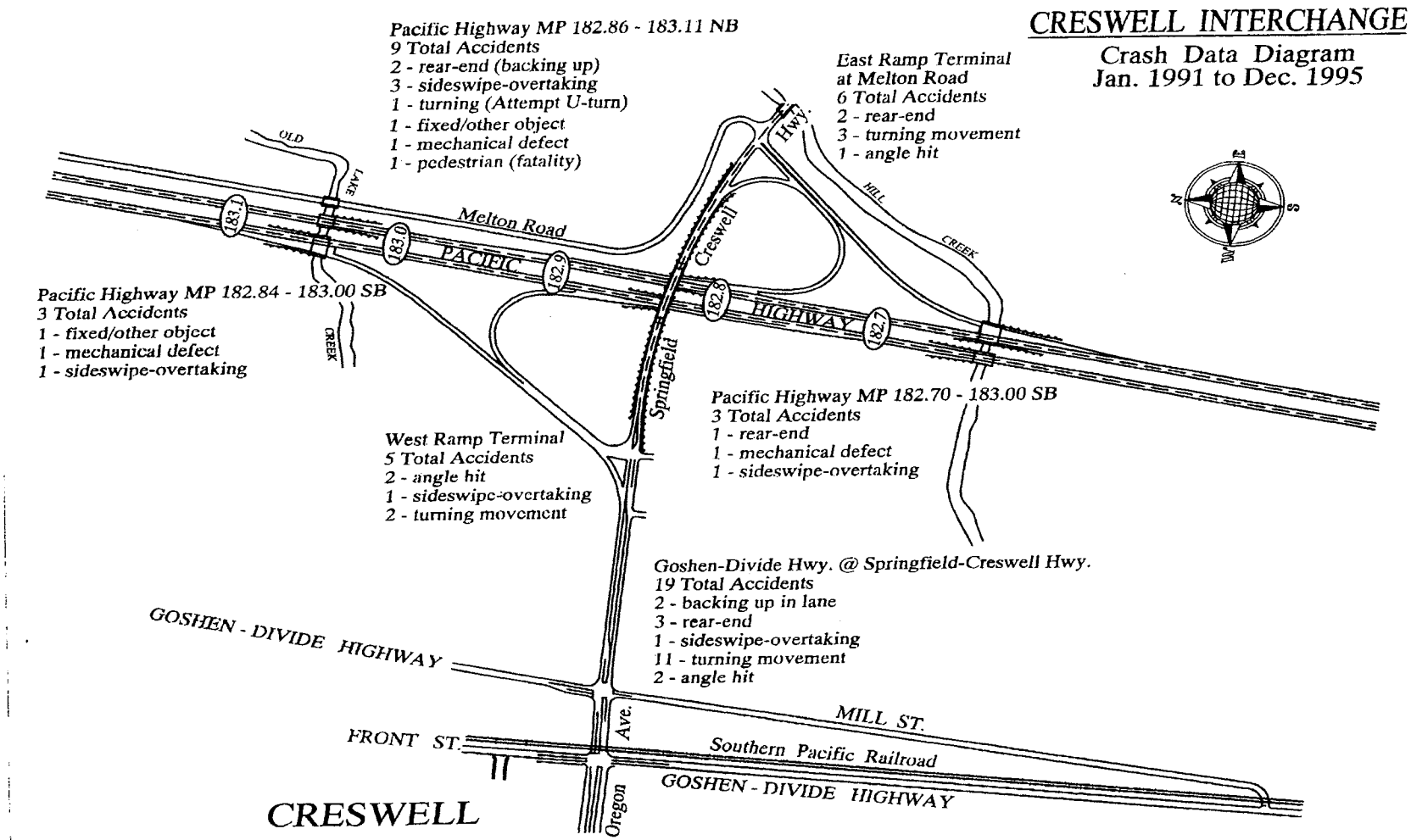
building an additional east-west roadway south of Oregon Avenue. Drivers patronizing the businesses south of Oregon Avenue will be able to access Southern Goshen-Divide Highway in lieu of turning left onto Oregon Avenue. ODOT staff recommends an east-west connection from North Goshen-Divide Highway to the KOA/trailer park access along the northerly property limits of the post office. This roadway would give people in the KOA campground area another way out. This proposed roadway would lessen the turning movements at the existing KOA Access/Oregon Avenue Intersection.

There were also concerns about the proposed relocation of Melton Road on Springfield-Creswell Highway. Melton Road would be relocated approximately 150 meters (500 feet) east of the northbound freeway ramp terminals to meet ODOT design standards. This distance is to insure the operation of the Creswell/I-5 Interchange is not adversely affected by the close proximity of the Melton Road/Springfield-Creswell Intersection. This proposed location divides the property that is located to the north. These preliminary plans mean to emphasize the point that Melton Road be relocated a minimum of 150 meters (500 feet) east of the northbound freeway ramp terminals. The exact relocation of Melton Road will be decided after this project is funded and enters the project development phase.

There were reports of a safety problem on the curve that is located on Springfield-Creswell Highway east of Creswell/I-5 Interchange. Vehicles were reported to leave the roadway and end up on household lawns. The accident report did not reveal any reportable accidents along this curve within the past 4½ years. However, it is possible that these accidents did occur and were never reported.

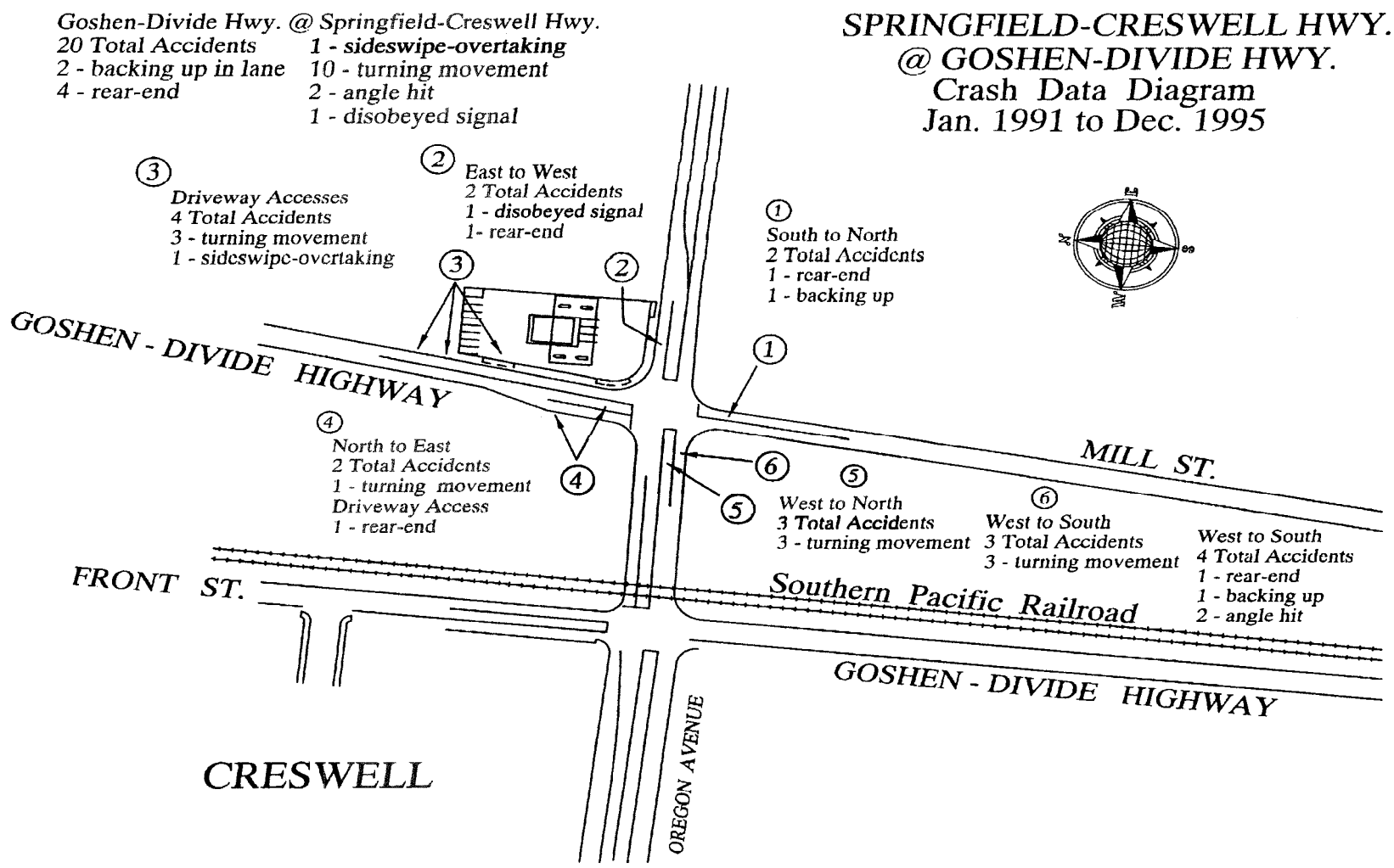
Crash data has been tabulated for the both the Creswell/I-5 Interchange and the Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection. The attached Figure 9 shows crash data for the existing Creswell/I-5 Interchange. Figure 10 shows the crash data for the existing Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection. This data is for the time period from January 1, 1991 to December 31, 1995.

Both build concepts propose an additional eastbound and westbound lane along Oregon Avenue between the Creswell/I-5 Interchange and the Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection. These proposed lanes will impact businesses heavily along Oregon Avenue, but are needed to compensate for the rapid growth that will be experienced in the immediate area. If these lanes are not constructed, future congestion will cause both drivers traveling along Oregon Avenue and drivers that are patronizing local businesses in Creswell to



OREGON DEPARTMENT OF TRANSPORTATION TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Interchange Refinement Plan - Crash Data **Pacific Highway, No. 1 M.P. 182.83 Lane County**	**File : cres_acc1.ppt** **Date : 12/9/97**	**Prepared By: Gerry Juster** **Reviewed By: Harlan Nale**	FIGURE 9



OREGON DEPARTMENT OF TRANSPORTATION TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Interchange Refinement Plan - Crash Data **Pacific Highway, No. 1 M.P. 182.83 Lane County**	File : cres_acc1.ppt	Prepared By: Gerry Juster	FIGURE 10
	Date : 12/9/97	Reviewed By: Harlan Nale	

experience unacceptable traffic flow delays. Vehicles will "back-up" onto the freeway at the Creswell/I-5 Interchange.

Neither Concept 1 or 2 provides acceptable signal spacing. The proposed intersection of southern Goshen-Divide Highway at Oregon Avenue will meet Preliminary ADT Traffic Signal Warrants before the year 2015 for both concepts. A traffic signal at this location will not meet the Goals and Objectives that have been written for the Creswell Refinement Plan. The revised objectives are "Develop an access management plan along the Springfield/Creswell Highway (Oregon Avenue and Cloverdale Road) that incorporates the access category #5 in the Oregon Highway Plan." The revised objectives indicate that a traffic signal at this location is not acceptable. Category 5 of the Access Management Classification System table indicates that ¼ mile spacing is needed between traffic signals on Oregon Avenue. If southern Goshen-Divide Highway/Oregon Avenue Intersection is signalized, there will be three traffic signals within a distance of 400 meters (1300 feet). Three traffic signals at this spacing on Oregon Avenue will cause both unacceptable delay and disruptions to through traffic flows. The only time it is acceptable to space traffic signals less than ¼ mile apart is to optimize capacity and safety. In this case, both capacity and safety will be sacrificed due to the inadequate spacing.

The comments that were made by the citizens at the April 28, 1997 Creswell Open House have been reviewed and were considered when the next three build concepts were proposed.

THREE ADDITIONAL BUILD ALTERNATIVES

Three additional build concepts (Concepts 1A, 2 and 3) have been proposed since the Open House on April 28, 1997. All three concepts have the same Creswell/I-5 Interchange design. The only difference between the concepts pertains to the portion of Oregon Avenue that is located west of the interchange. The major problem along Oregon Avenue is the two existing intersections on Oregon Avenue that is formed by the "jog" of Goshen-Divide Highway at the railroad. Each of the three concepts has a different method for addressing this problem.

Build Concepts 1A, 2 and 3 share the following design criteria:

- Reconstruct the existing interchange to current design standards.
- Widen the structure over the freeway to provide for two additional lanes.
- Accommodate all transportation modes—motorized vehicles, pedestrians and bicycles.
- Improve the safe stopping-sight distance over the structure and at the ramp terminals.
- Improve both the northbound ramp terminal and the northbound freeway loop on-ramp.
- Relocate Melton Road to meet minimum spacing requirements of at least 150 meters (500 feet) from the northbound freeway ramp terminal.

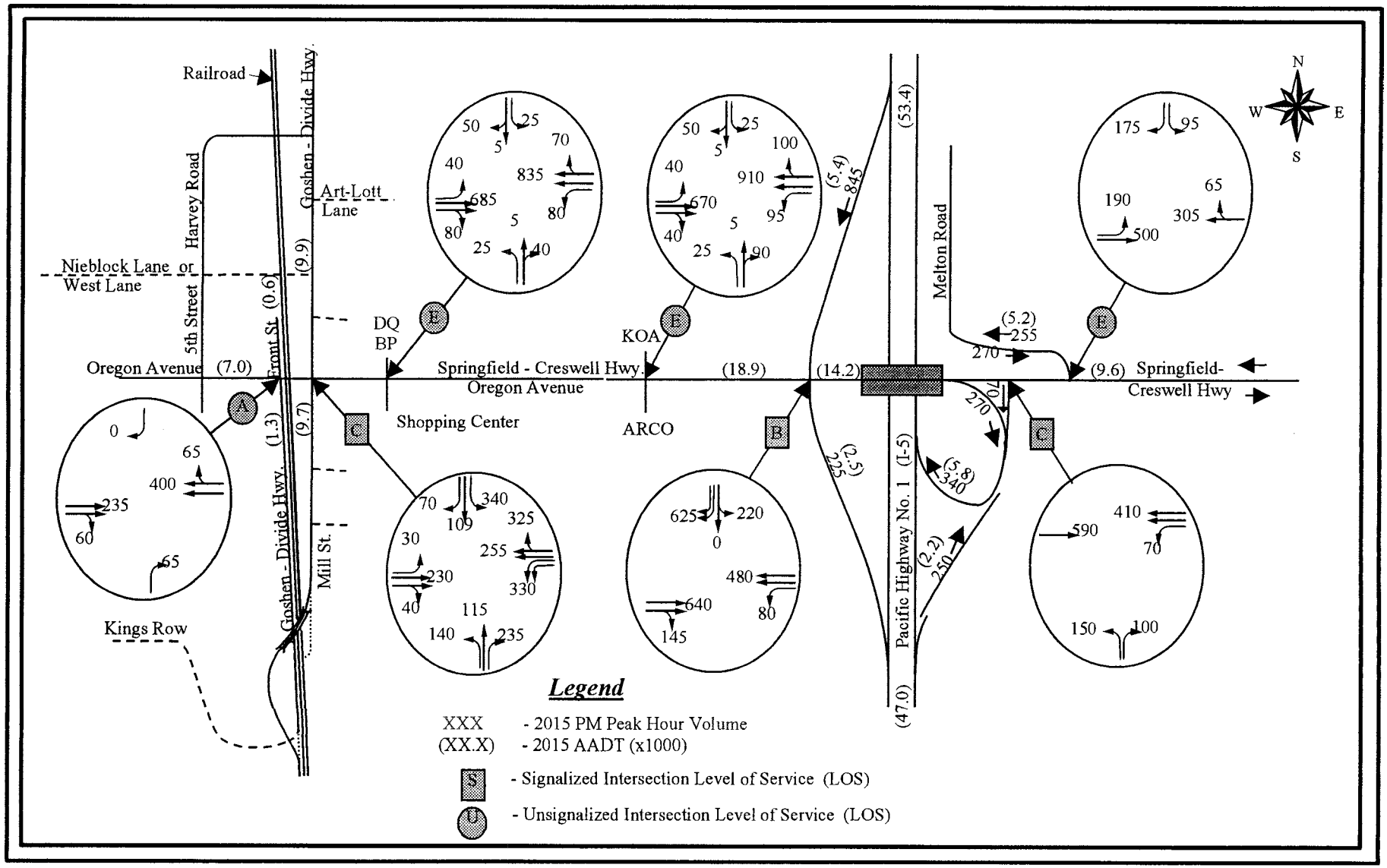
- Remove the southbound freeway loop on-ramp and replace it with a standard southbound on-ramp interchange leg.
- Relocate the southbound freeway ramp terminal approximately 70 meters (230 feet) to the east so that the distance between the ramp terminal and the KOA Access/Oregon Avenue Intersection is close to meeting the 150-meter (500-foot) standard.
- Construct dual right turn lane on the north approach of the Southbound Freeway Off-ramp at Oregon Avenue intersection for vehicles turning west on Oregon Avenue.
- Both northbound and southbound freeway ramp terminals meet Preliminary ADT Traffic Signal Warrants before the year 2015.
- Require an additional eastbound and westbound lane along Oregon Avenue between the Creswell/I-5 Interchange and the Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection.
- Includes the proposed extensions of either Nieblock Lane or West Lane easterly to Northern Goshen-Divide Highway.
- Includes the proposed extension of Kings Row both easterly and southerly to Southern Goshen-Divide Highway.

CONCEPT 1A - MAJOR REALIGNMENT OF SOUTHERN GOSHEN-DIVIDE HIGHWAY (Grade Separation)

Figure 11 shows Year 2015 Traffic Volumes, LOS and lane configurations for Concept 1A.

ADDITIONAL FEATURES FOR CONCEPT 1A

- Provides a grade-separated crossing over both the railroad and the portion of Goshen-Divide Highway that is located north of Market Road and south of Oregon Avenue.
- The new alignment of Goshen-Divide Highway will utilize Mill Street.
- A new "4-legged" intersection will be created on the new alignment of Goshen-Divide highway south of the proposed grade crossing.
  1. The new alignment of Goshen-Divide Highway will be the main roadway.
  2. Kings Row will be extended both easterly and southerly to intersect the new alignment of Goshen-Divide Highway at right angles south of the proposed grade crossing.
  3. The existing Goshen-Divide Highway will be realigned to the west to intersect new alignment of Goshen-Divide Highway "straight-across" from Kings Row.
- There will be a raised median on Oregon Avenue at the Front Street/existing Goshen-Divide Highway at Oregon Avenue intersection.



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, Concept 1 - w/ TSP Extensions, 2015 Design Hour Volumes **Realignment of Southern Goshen -Divide Highway**	**FILE : Creswell-2.PPT**	**Prepared By: Harlan Nale**	FIGURE 11
	DATE : 11/26/97	**Reviewed By: Brian Dunn**	

The analytic results for the year 2015 have been tabulated in Table 7:

Table 7 – Year 2015 Levels of Service (LOS) for Concept 1A

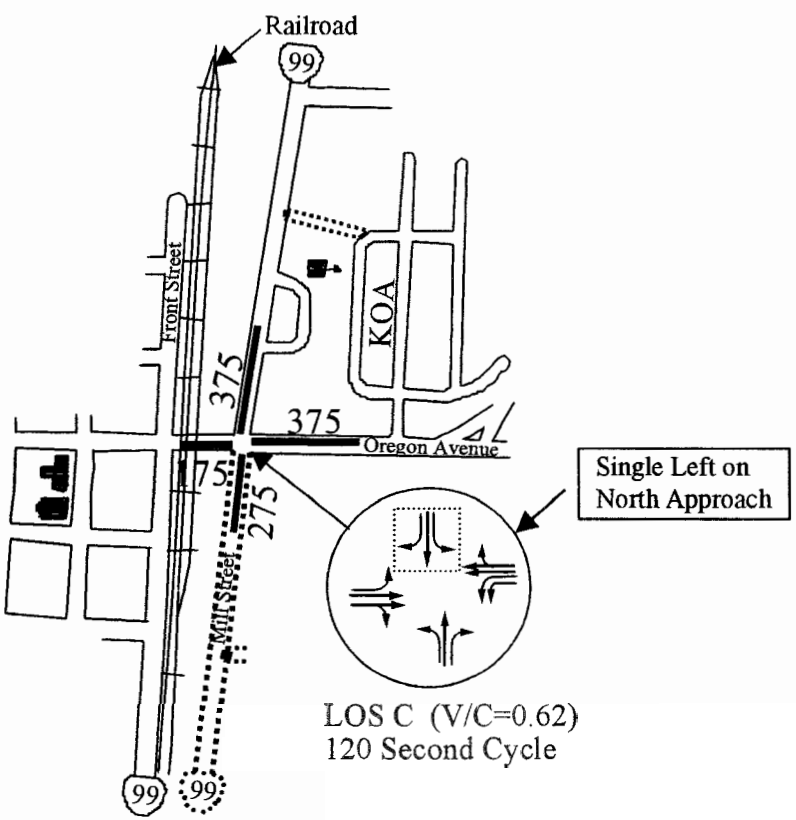
Intersection	Unsignalized	Signalized
Melton Road at Springfield-Creswell Highway	E	----
Northbound Freeway Ramps at Springfield-Creswell Highway	----	C
Southbound Freeway Ramps/Arco Station Access at Oregon Avenue	----	B
KOA Access at Oregon Avenue	E	----
BP Station/Shopping Center Accesses at Oregon Avenue	E*	----
Realigned Goshen-Divide Highway Street at Oregon Avenue	----	C
Front Street at Oregon Avenue	A	----
Existing Southern Goshen-Divide Highway at Oregon Avenue	A	----

*The LOS shown in this table assumes that traffic queues from adjacent intersections do not cause adverse effects on intersection operation. If traffic queues from a "closely-spaced" intersection blocks the operation of the intersection that is being analyzed, the resulting LOS will probably be LOS F in lieu of the LOS that is reported in this table.

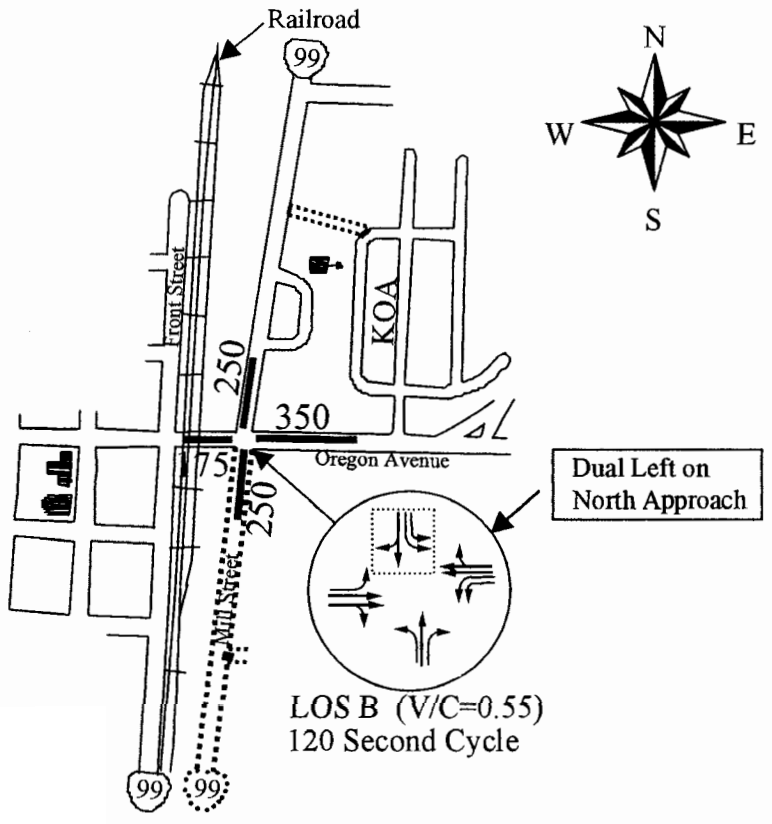
The proposed "4-Legged" unsignalized intersection created by extending Kings Row easterly to Goshen-Divide Highway "straight-across" from the existing realigned Southern Goshen-Divide Highway will operate at LOS C.

Storage distance is an important factor on the roadways within the City of Creswell. If vehicles at an intersection are "stacked" past an access to a business, some drivers may not patronize the business due to drivers' difficulty in either entering or leaving the business access (or both). Schematics showing the estimated storage distance have been prepared for each of the three build concepts. Figure 12 shows both lane configurations and storage distances for Concept 1A.

Figure 12 shows two schematics with the estimated storage distances for the proposed Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection. The additional eastbound and westbound lane on Oregon Avenue reduces storage distances on Oregon Avenue by providing an additional lane in each direction on Oregon Avenue for vehicles to "stack" in. In the year 2015, vehicles traveling westbound on Oregon Avenue will be "stacked" approximately 375 feet to the east. The schematic on the right in Figure 12 shows the effect a southbound dual left turn lane will have on storage distance in lieu of a single left turn lane (schematic on the left). Southbound dual left turn lanes in lieu of a single left turn



Year 2015
Storage Distances (Feet)
Single Left (With Extensions)



Year 2015
Storage Distances (Feet)
Dual Left (With Extensions)

OREGON DEPARTMENT OF TRANSPORTATION TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, Build Concept 1 **Storage Distances for the Year 2015**	**File : Creswell~1.PPT** **Date : 11/25/97**	**Prepared By: Harlan Nale** **Reviewed By: Brian Dunn**	FIGURE 12

lane will both improve the operational characteristics of the intersection and reduce the storage distance requirement. The LOS will improve from LOS C to LOS B.

ADVANTAGES OF CONCEPT 1A

- Constructs a new/wider structure over I-5 that accommodates all transportation modes.
- Improved sight distance at the freeway ramp terminals because of new profile grade and wider structure on the Springfield-Creswell Highway.
- The grade separated crossing over both the railroad and the existing Goshen-Divide Highway will cause most of the traffic flows on the portion of Goshen-Divide Highway located south of Oregon Avenue to use Mill Street in lieu of the existing Goshen-Divide Highway.
- The grade separated crossing over both the railroad and the existing Goshen-Divide Highway could be phased. This railroad crossing could be constructed "at-grade" with the ability to structure over the railroad at a later date.
- Eliminates the "jog" on Goshen-Divide Highway traffic flows at the railroad crossing on Oregon Avenue by utilizing Mill Street for future Goshen-Divide Highway traffic flows.
- The raised median at Front Street/existing Goshen-Divide Highway at Oregon Avenue will improve safety by limiting both Front Street and the existing Goshen-Divide Highway to right in/out.
  Reduces traffic flows on the existing portion of Goshen-Divide Highway that is located between Oregon Avenue and the proposed extension of Kings Row.
- Provides a through connection to the Goshen-Divide Highway to the Goshen-Divide Highway to/from Kings Row.
- Improves the roadway section along Oregon Avenue to accommodate future traffic demand.
- Reduces accident potential by removing the "at-grade" railroad crossing of Mill Street at the Goshen-Divide Highway.
- Maintains the existing Goshen-Divide Highway to downtown.
- Provides an acceptable level of service (LOS) for all signalized intersections.
- Increases the distance from the southbound freeway ramp terminal to the signalized intersection of Goshen-Divide Highway/Mill Street at Oregon Avenue.
- Maximizes the distance from the freeway ramp terminals to the closest access point.

DISADVANTAGES OF CONCEPT 1A

- Does not remove the railroad grade crossing on Oregon Avenue.
- Significant right of way impact to businesses and residences.
- High structure cost to grade separate the railroad.
- Removes Mill Street access from South Goshen-Divide Highway.
- Long storage lengths on Oregon Avenue will discourage some trips to/from services during the busiest time of the day (4-6 PM).

- Limits turn movements at the intersection of Front Street and Oregon Avenue to right in/out.

COST SUMMARY* – CONCEPT 1A

Cost: $13.5 million (If the railroad is grade separated at Goshen-Divide Highway)
$10.5 million (If the railroad is **not** grade separated at Goshen-Divide Highway)

Construction Cost: $6.0 million (If the railroad is grade separated)
$3.0 million (If the railroad is **not** grade separated)
$7.5 million (Interchange)

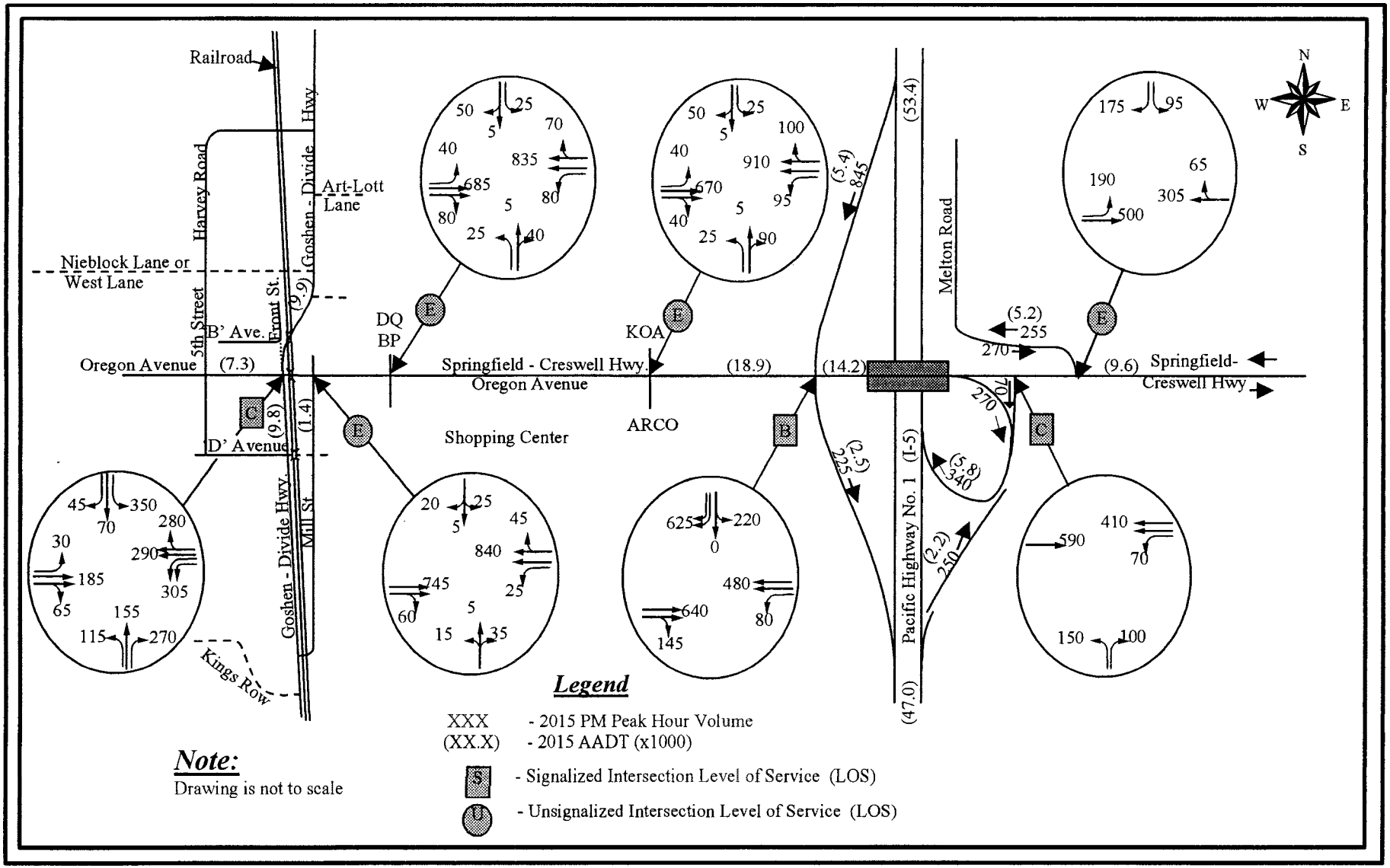
*The cost estimates given were provided by the Preliminary Design Unit (PDU) in Salem. The estimates are reconnaissance-level estimates and include costs for roadway construction only. Right of way costs are not included.

CONCEPT 2 - MAJOR REALIGNMENT OF NORTHERN GOSHEN-DIVIDE HIGHWAY (Depressed Railroad Grade Separation)

Figure 13 shows Year 2015 Traffic Volumes, LOS and lane configurations for Concept 2.

ADDITIONAL FEATURES OF CONCEPT 2

- Depresses the railroad under Oregon Avenue.
- The portion of Front Street that is located between "B" Street and Oregon Avenue is removed.
- The portion of Goshen-Divide Highway that is located north of Oregon Avenue will be realigned to the west to intersect the northern portion of Front Street.
- Removes the "at-grade" crossing on Oregon Avenue.
- Moves the existing traffic signal at the Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection to the adjacent intersection that is located approximately 80 meters (260 feet) to the west.
- Extends "D" Street easterly to Mill Street.
- Suggests extending the northern east-west roadway within the KOA campground area to intersect with northern Goshen-Divide Highway.
- Maintains Mill Street as the truck route to the mill.



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, Concept 2 - w/ TSP Extensions, 2015 Design Hour Volumes Depressed Railroad & Realign Goshen-Divide Hwy.	FILE : Creswell-2.PPT	Prepared By: Harlan Nale	FIGURE 13
	DATE : 11/26/97	Reviewed By: Brian Dunn	

The analytic results for the year 2015 have been tabulated in Table 8:

Table 8 – Year 2015 Levels of Service (LOS) for Concept 2

Intersection	Unsignalized	Signalized
Melton Road at Springfield-Creswell Highway	E	----
Northbound Freeway Ramps at Springfield-Creswell Highway	----	C
Southbound Freeway Ramps/Arco Station Access at Oregon Avenue	----	B
KOA Access at Oregon Avenue	E	----
BP Station/Shopping Center Accesses at Oregon Avenue	E*	----
Existing Goshen-Divide Highway/Mill Street at Oregon Avenue	E*	----
Realigned Goshen-Divide Highway (Front Street) at Oregon Avenue	----	C

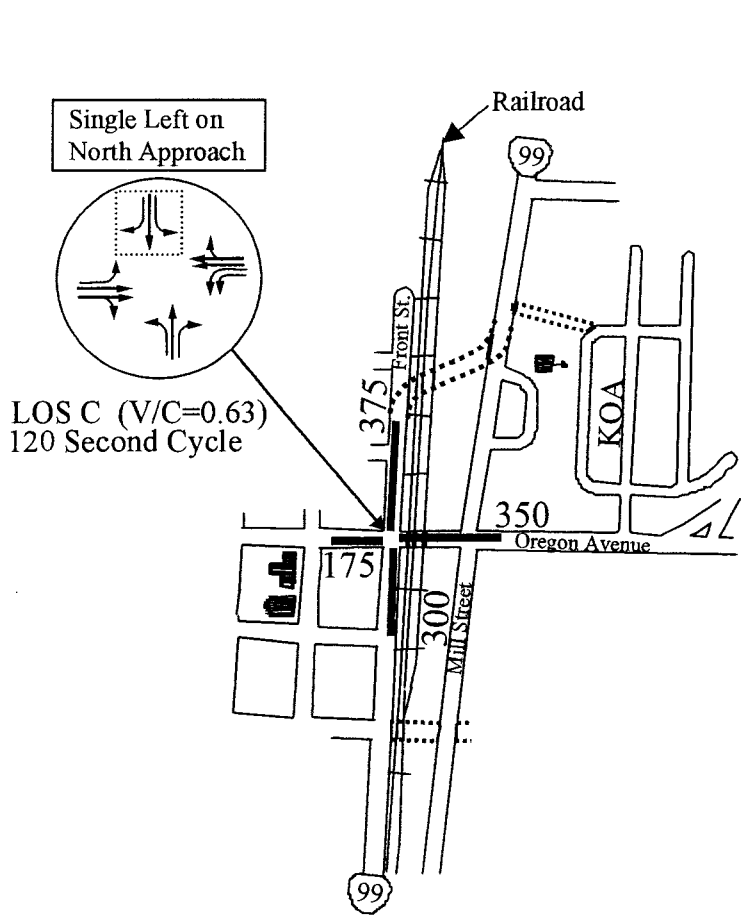
*The LOS shown in this table assumes that traffic queues from adjacent intersections do not cause adverse effects on intersection operation. If traffic queues from a "closely-spaced" intersection blocks the operation of the intersection that is being analyzed, the resulting LOS will probably be LOS F in lieu of the LOS that is reported in this table.

Figure 14 shows the estimated storage distances for the proposed Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection. The schematic on the right shows the effect a southbound dual left turn lane will have on storage distance in lieu of a single left turn lane. A southbound dual left turn lane in lieu of a single left turn lane will both increase the operational characteristics of the intersection and reduce the storage distance. However, traffic traveling westbound on Oregon Avenue will "stack" east of the existing Northern Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection blocking turning movements during heavier travel times.

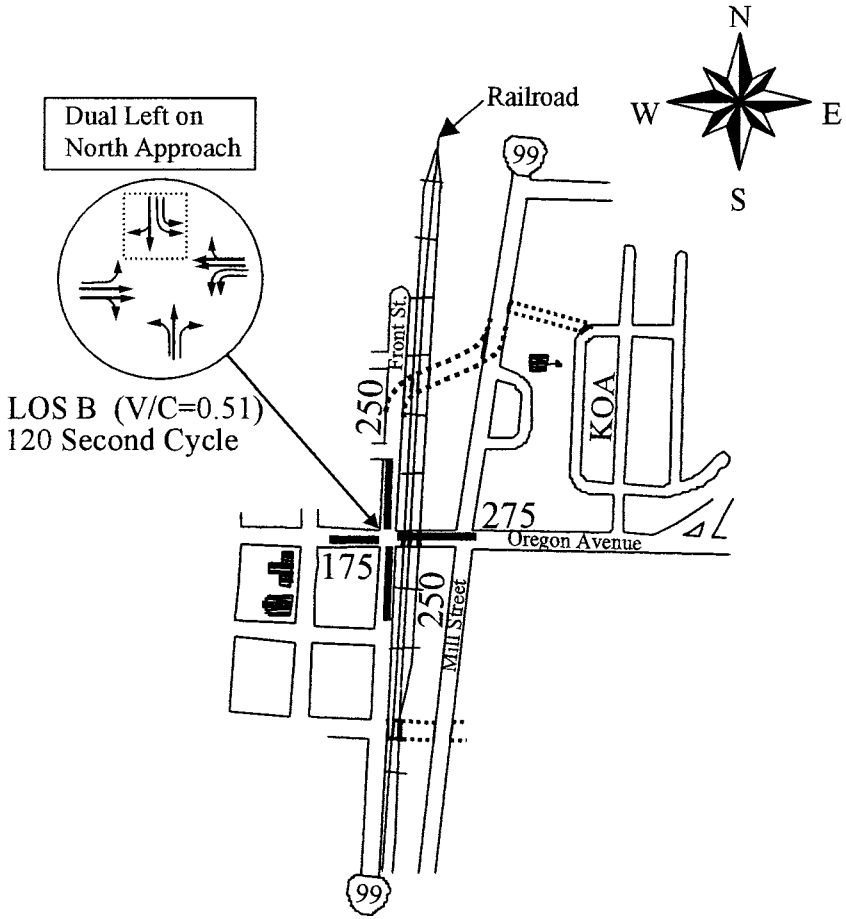
ADVANTAGES OF CONCEPT 2

Constructs a new/wider structure over I-5 that accommodates all transportation modes.

- Improved sight distance at the freeway ramp terminals because of new profile grade and wider structure on the Springfield-Creswell Highway.
- Maximizes spacing of signalized intersections-southbound freeway ramp terminal and the intersection of Oregon Avenue at the Goshen-Divide Highway.
- Maximizes the distance from the freeway ramp terminals to the closest access point.



Year 2015
Storage Distances (Feet)
Single Left (With Extensions)



Year 2015
Storage Distances (Feet)
Dual Left (With Extensions)

OREGON DEPARTMENT OF TRANSPORTATION TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, Build Concept 2 **Storage Distances for the Year 2015**	**File : Creswell~1.PPT** **Date : 12/03/97**	**Prepared By: Harlan Nale** **Reviewed By: Brian Dunn**	FIGURE 14

- Eliminates the "jog" on Goshen-Divide Highway traffic flows at the railroad crossing on Oregon Avenue by utilizing Front Street for future Goshen-Divide Highway traffic flows.
- Reduces accident potential by removing the "at-grade" railroad crossing of Mill Street at the Goshen-Divide Highway.
- Improves the roadway section along Oregon Avenue to accommodate future traffic demand.
- Provides an acceptable level of service (LOS) for all signalized intersections.
- New intersection of the Goshen-Divide Highway and Oregon Avenue improves traffic operations.
- Extension of 'D' Avenue provides alternative west-east circulation without the railroad crossing.
- Maintains Mill Street as the truck route to the mill.

DISADVANTAGES OF CONCEPT 2

Significant right of way impact to business and residences along Front Street and the South Goshen-Divide Highway.

- High cost to depress the railroad.
- Maintains Mill Street as the truck route to the mill.
- Westbound vehicles on Oregon Avenue will block the existing Northern Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection during heavier travel times.
- Long storage lengths on Oregon Avenue will discourage some trips to/from services during the busiest time of the day (4-6 PM).
- There will be some minor "out-of-direction" travel for drivers patronizing the businesses along Oregon Avenue.

COST SUMMARY* – CONCEPT 2

Cost: $20 million

Construction Cost: $12.5 million (Grade Separation)
$ 7.5 million (Interchange)

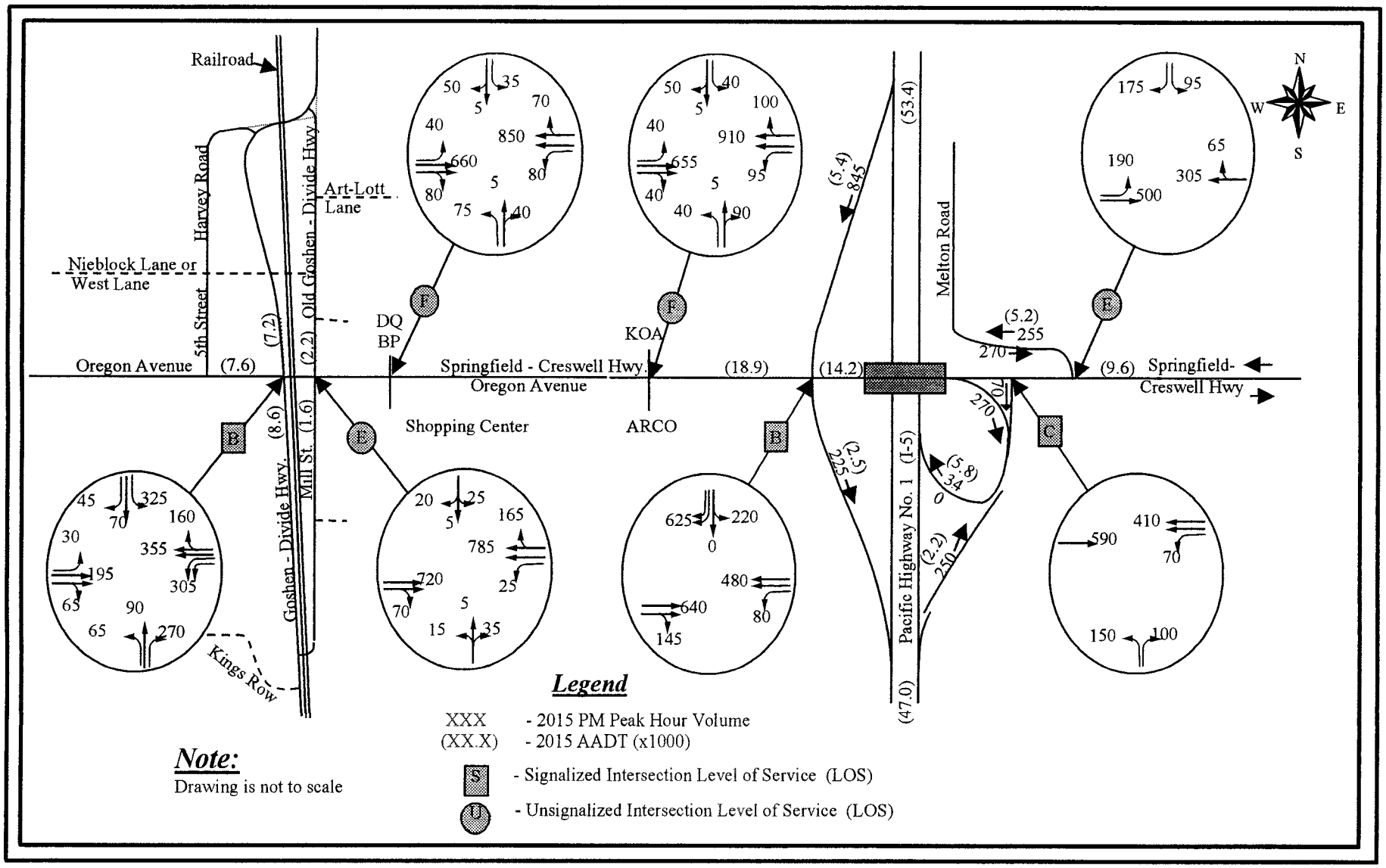
*The cost estimates given were provided by the Preliminary Design Unit (PDU) in Salem. The estimates are reconnaissance-level estimates and include costs for roadway construction only. Right of way costs are not included.

CONCEPT 3 - MAJOR REALIGNMENT OF NORTHERN GOSHEN-DIVIDE HIGHWAY

Figure 15 shows Year 2015 Traffic Volumes, LOS and lane configurations for Concept 3. Here is a description of the features for Concept 3:

ADDITIONAL FEATURES OF CONCEPT 3

- The portion of Goshen-Divide Highway that is located north of Oregon Avenue will be realigned to the west to intersect the northern portion of Front Street.



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, Concept 3 - w/ TSP Extensions, 2015 Design Hour Volumes Realign Goshen-Divide Hwy.	**FILE : Creswell-2.PPT**	**Prepared By: Harlan Nale**	FIGURE 15
	DATE : 11/26/97	**Reviewed By: Brian Dunn**	

- Realigned Goshen-Divide Highway will utilize the existing "at-grade" railroad crossing on Harvey Road.
- Creates a new connection of Harvey Road and the Goshen-Divide Highway.
- The eastern portions of both "B" Avenue and "C" Avenue will be cul-de-saced.
- Moves the existing traffic signal at the Goshen-Divide Highway/Mill Street at Oregon Avenue intersection to the adjacent intersection that is located approximately 80 meters (260 feet) to the west.
- Maintains Mill Street as the truck route to the mill.
- Suggests extending the northern east-west roadway within the KOA campground area to intersect with Northern Goshen-Divide Highway.
- Suggests constructing an access on Mill Street so drivers patronizing the businesses located south of Oregon Avenue will have another way out of the business area.

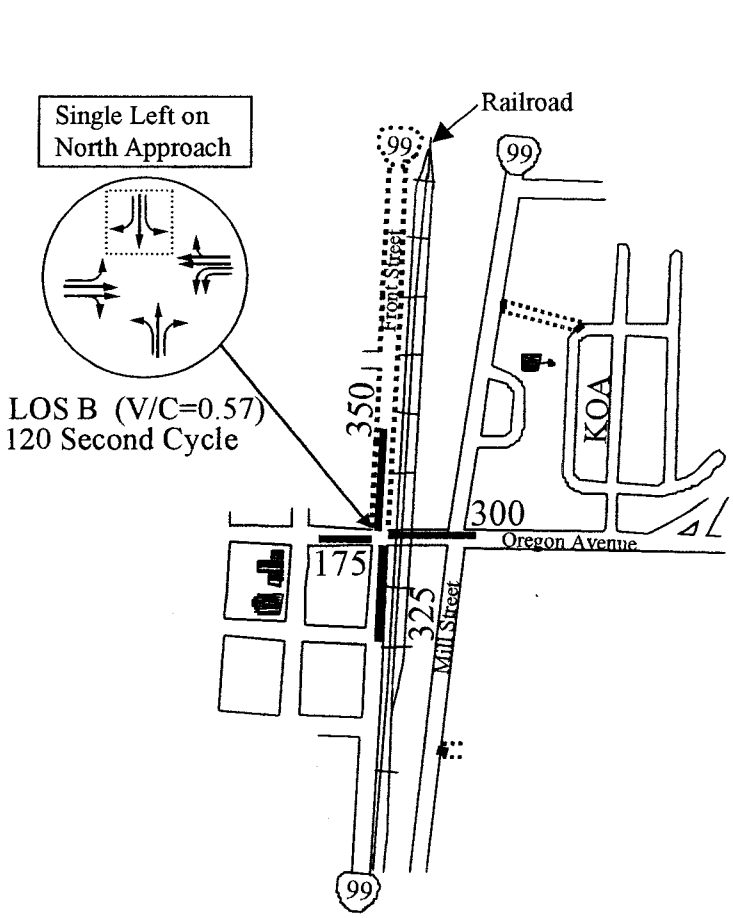
The analytic results for the year 2015 have been tabulated in the following table:

Table 9 – Year 2015 Levels of Service (LOS) for Concept 3

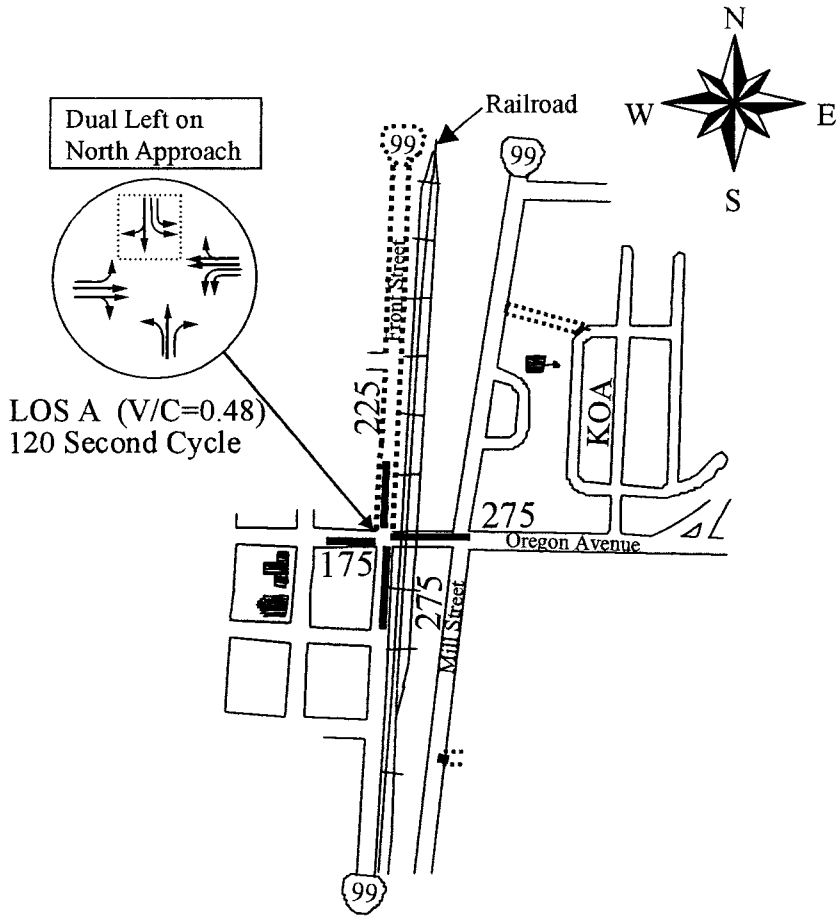
Intersection	Unsignalized	Signalized
Melton Road at Springfield-Creswell Highway	E	----
Northbound Freeway Ramps at Springfield-Creswell Highway	----	C
Southbound Freeway Ramps/Arco Station Access at Oregon Avenue	----	B
KOA Access at Oregon Avenue	F	----
BP Station/Shopping Center Accesses at Oregon Avenue	F	----
Existing Goshen-Divide Highway/Mill Street at Oregon Avenue	E*	----
Realigned Goshen-Divide Highway (Front Street) at Oregon Avenue	----	B

*The LOS shown in this table assumes that traffic queues from adjacent intersections do not cause adverse effects on intersection operation. If traffic queues from a "closely-spaced" intersection blocks the operation of the intersection that is being analyzed, the resulting LOS will probably be LOS F in lieu of the LOS that is reported in this table.

Figure 16 shows the estimated storage distances for the proposed Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection. The schematic on the right shows the effect a southbound dual left turn lane will have on storage distance in lieu of a single left turn lane. A southbound dual left turn lane in lieu of a single left turn lane will both improve the operational characteristics of the intersection and reduce the storage distance. However, traffic traveling westbound on Oregon



Year 2015
Storage Distances (Feet)
Single Left (With Extensions)



Year 2015
Storage Distances (Feet)
Dual Left (With Extensions)

OREGON DEPARTMENT OF TRANSPORTATION TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, Build Concept 3 **Storage Distances for the Year 2015**	**File : Creswell~1.PPT** **Date : 12/03/97**	**Prepared By: Harlan Nale** **Reviewed By: Brian Dunn**	FIGURE 16

Avenue will "stack" east of the existing Northern Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection blocking turning movements during heavier travel times.

ADVANTAGES OF CONCEPT 3

- Constructs a new/wider structure over I-5 that accommodates all transportation modes.
- Improved sight distance at the freeway ramp terminals because of new profile grade and wider structure on the Springfield-Creswell Highway.
- Improves the roadway section along Oregon Avenue to accommodate future traffic demand.
- Eliminates the "jog" on for Goshen-Divide Highway at the railroad crossing on Oregon Avenue by utilizing Front Street for future Goshen-Divide Highway traffic flows.
- Maximizes spacing of signalized intersections-southbound freeway ramp terminal and the intersection of Oregon Avenue at the Goshen-Divide Highway.
- Provides access to developing residential area on north end of the city by Nieblock Road or Harvey Road.
- Provides an acceptable level of service (LOS) for all signalized intersections.
- Maintains Mill Street as the truck route to the mill.
- Maximizes the distance from the freeway ramp terminals to the closest access point.

DISADVANTAGES OF CONCEPT 3

- Does not remove the railroad grade crossing on Oregon Avenue.
- Significant right of way impact to businesses and residences.
- Removes "B" Avenue, "C" Avenue and Front Street accesses from Goshen-Divide Highway.

  The vehicles within the westbound dual left turn lanes at the proposed Goshen-Divide Highway (Front Street) at Oregon Avenue will be "stacked" on Oregon Avenue to the east of Mill Street.
- Drivers will find it very difficult to turn left onto Oregon Avenue from all accesses that are located on Oregon Avenue between Creswell/I-5 Interchange and the railroad tracks.
- There will be considerable "out-of-direction" travel for drivers patronizing the businesses along Oregon Avenue.
- Long storage lengths on Oregon Avenue will discourage some trips to/from services during the busiest time of the day (4-6 PM).

COST SUMMARY* – CONCEPT 3

Cost: $13.1 million (If the railroad is **not** grade separated at Harvey Road)
$16.0 million (If the railroad is grade separated at Harvey road)

Construction Cost: $5.6 million (If the railroad is **not** grade separated)
$8.5 million (If the railroad is grade separated)
$7.5 million (Interchange)

*The cost estimates given were provided by the Preliminary Design Unit (PDU) in Salem. The estimates are reconnaissance-level estimates and include costs for roadway construction only. Right of way costs are not included.

STORAGE DISTANCES AT PROPOSED CRESWELL /I-5 INTERCHANGE

Storage distance requirements for both the northbound and southbound freeway ramp terminals are the same for all build concepts (Concepts 1A, 2 and 3) since the design for the proposed interchange is the same for all build concepts. These distances are tabulated for the northbound freeway ramp terminals and southbound freeway ramp terminals in Tables 10 and 11 respectively. All distances are given in meters (feet).

Table 10 - Storage Distance Requirements for Northbound Freeway Ramps at Springfield-Creswell Highway (Concepts 1A, 2 and 3)

Approach	Left	Through	Right	Available
South	30 (100)	0 (0)	25 (75)	(120) 400
North	0 (0)	0 (0)	0 (0)	N/A
West	0 (0)	45 (150)	0 (0)	260 (850) to Ramp Intersection
East	10 (25)	15 (50)	0 (0)	70 (225) for left turn 170 (550) for thru's

Table 11 - Storage Distance Requirements for Southbound Freeway Ramps at Oregon Avenue (Concepts 1A, 2 and 3)

Approach	Left	Through	Right	Available
South	0 (0)	0 (0)	0 (0)	N/A
North	40 (125)	40 (125)	55 (175)	70 (225)
West	0 (0)	55 (175)	55 (175)	45 (150) for left turn 150 (500) feet for thru's
East	15 (50)	30 (100)	0 (0)	260 (850) to Ramp Intersection

There are no problems with the storage distance requirements at either Northbound or Southbound Freeway Ramp Terminals. ODOT guidelines require approximately 150 meters (500) feet of distance between the freeway ramp terminal and any adjacent access. The reason for requiring 500 feet (150 meters) of distance between the nearest access and interchange ramps is to insure that traffic flows at adjacent accesses will not interfere with the operation of the

freeway interchange ramps. All three build concepts will realign Melton Road at least 150 meters (500 feet) east of the northbound freeway interchange ramps. There will be approximately 485 feet of distance between the KOA Access and the southbound freeway interchange ramps. The location of this access is close enough to the 500-foot guideline so that the KOA access will probably remain in its existing location.

SUMMARY COMPARING THE NO BUILD AND FIVE BUILD ALTERNATES

Table 12, Year 2015 Ability to Satisfy Project Objectives and Design Criteria

Project Objective	No Build	Initial Open House		Advanced Concepts		
		Concept 1	Concept 2	Concept 1A	Concept 2	Concept 3
Meets Goals and Objectives	∅	∅	∅	✔	✔	∅
Acceptable Distance Between Freeway Ramps and Adjacent Accesses	∅	∅	∅	✔	✔	✔
Eliminates the "Jog" of Goshen-Divide Highway	∅	∅	∅	✔	✔	✔
Improves Connectivity for the Portion of Oregon Avenue Located East of the Railroad	∅	∅	∅	✔	✔	∅
Limits Impact to both Residential and Business Properties	N/A	N/A	N/A	✔	∅	∅
Project is both Phaseable and Fundable	N/A	N/A	N/A	✔	✔	✔

✔ Satisfies Project Objective
∅ Does not Satisfy Project Objective
N/A Not Applicable to Project Objective

- The No-Build Option does not satisfy any of the project goals and objectives.
- Concept 1A best satisfies the goals, objectives and design criteria for the project. It provides significant operational benefits by both improving the interchange and by adding an additional eastbound and westbound lane on the portion of Oregon Avenue that is located between the interchange and Front Street. The Creswell Citizen Advisory Committee (CAC) preferred Concept 1A.
- Concept 2 (Advanced Concepts) will cause heavy impacts to businesses that are located along Goshen-Divide Highway. Concept 2 (Advanced Concepts) will cost approximately $6.5 million more than Concept 1A if a new structure is constructed over Goshen-Divide Highway. If an "at-grade" intersection is constructed in both

Concept 1A and Concept 2 (Advanced Concepts) in lieu of the proposed structure, the difference in cost will be approximately $9.5 million.

- Concept 3 does not satisfy all of the goals and objectives of the project. It does not improve the connectivity for the portion of Oregon Ave. located east of the railroad and it has heavy impacts to businesses that are located along Goshen-Divide Highway.

POSSIBLE SHORT-TERM SOLUTIONS

Concept 1A is the preferred long term solution for Creswell. However, ODOT may not have the funding available to build Concept 1A for several years. Meanwhile, the city of Creswell is increasing in population and traffic conditions are getting worse. Since it is unlikely that Creswell will get money to construct Concept 1A in the near future, what can be done in the short term to improve traffic flows along Oregon Avenue?

1. Is it possible to improve the intersection of the Goshen-Divide Highway at Oregon Avenue? Will an additional traffic signal at the Front Street/Southern Goshen-Divide Highway at Oregon Avenue intersection be a viable short-term solution?

   An additional traffic signal at the Front Street/Southern Goshen-Divide Highway at Oregon Avenue Intersection is not a viable short-term solution. The ODOT Traffic Management Section has indicated that a single controller can not be "timed" efficiently to operate the "closely spaced" Front Street/Southern Goshen-Divide Highway and Northern Goshen-Divide Highway/Mill Street at Oregon Avenue intersections.

2. Will access management along Oregon Avenue help to improve the traffic flow?

   There are both traffic and safety benefits to implementing an access management plan along Oregon Avenue. By implementing street, signal and driveway spacing standards, we can eliminate unexpected events and separate decision points which results in:

   fewer crashes,
   - improved traffic flow,
   - reduced delay,
   - increased capacity,
   - improved fuel economy, and
   - reduced emissions.

   The number of accesses located along Oregon Avenue could be reduced. Some adjacent accesses could be combined into single accesses. A median could be constructed in strategic locations. This access management strategy plan could be initiated by ODOT District Office. The ODOT District Office and the local

businesses could meet to develop an access management strategy plan that would best satisfy their needs.

RECOMMENDATION, CONCLUSION & SUMMARY

The Creswell CAC selected Concept 1A as the preferred concept for the draft refinement plan. Concept 1A best satisfies the goals, objectives and design criteria for the project. Concept 1A provides significant operational benefits by both improving the interchange and by adding an additional eastbound and westbound lane on the portion of Oregon Avenue that is located between the interchange and Front Street.

The proposed design for Creswell/I-5 Interchange is identical for Concepts 1A, 2 and 3, and will be designed to ODOT standards. There are traffic signals proposed at both northbound and southbound freeway ramp terminals. The southbound loop on-ramp will be removed so that the southbound freeway ramp terminals can be relocated approximately 150 feet to the east. This relocation will increase the distance between the southbound freeway ramp terminals and the KOA access to approximately 485 feet. The "free right" turn lane at the southbound freeway ramp terminal will be eliminated and will be replaced by dual right turn lanes that will be controlled by a traffic signal. This will improve safety at the KOA access/Oregon Avenue Intersection.

Concept 1A includes constructing an additional eastbound and westbound lane on Oregon Avenue between the interchange and Front Street. This additional lane will severely impact the businesses along Oregon Avenue. However, if these lanes are not constructed, these businesses will be impacted by heavier traffic volumes and congestion along Oregon Avenue.

It is recommended that the following suggestions be considered in addition to Concept 1A:

- The northern east-west roadway within the KOA Campground should be extended westerly to Goshen-Divide Highway.
- Another east-west roadway should be constructed south of Oregon Avenue connecting Goshen-Divide Highway to the area that is located south of Oregon Avenue and east of Goshen-Divide Highway. Constructing this proposed roadway would provide drivers other opportunities to access Oregon Avenue during heavy traffic flows.
- Dual left turn lanes should be constructed in lieu of a single left turn lane on the north approach of the proposed Northern Goshen-Divide Highway/Mill Street at Oregon Avenue Intersection. This will both improve the LOS of this intersection from "C" to "B" and shorten storage distance requirements in the intersection influence area. The "drawback" to constructing the dual left turn lanes is the impact that will be experienced by surrounding properties.

There is no apparent easy short-term solution to improve the operation at both of the Goshen-Divide Highway/Oregon Avenue intersections. The installation of traffic signals at the Front Street/Southern Goshen-Divide Highway at Oregon Avenue Intersection will result in inefficient operation and will fail with the future increases in traffic demand. An access management strategy plan will improve traffic flows along Oregon Avenue. Both the ODOT District Office and the local businesses should meet to develop an access management strategy plan that would best satisfy their needs.

APPENDIX A

GOAL, OBJECTIVES AND CRITERIA, CRESWELL INTERCHANGE REFINEMENT PLAN ALTERNATIVES

FINAL DRAFT

Goal, Objectives and Criteria
Creswell Interchange Refinement Plan Options

June 1997

BACKGROUND STATEMENT:

It is important to establish the role and desired function of the interchange before stating the design goal and objectives for the Creswell Interchange Refinement Plan. There are statewide design standards, and policies for interchanges along Interstate 5. These standards and policies act as a guide when formulating goals, objectives and criteria during the alternatives phase of the refinement plan. The Oregon Transportation Plan, Oregon Highway Plan and the Willamette Valley Strategy contain broad policies regarding interchanges along Interstate-5. The Federal Highway Administration also has developed specific policies concerning the creation of new interchanges and modifying existing interchanges along the interstate system. ODOT also relies on the Highway Design Manual and a draft discussion paper "Interchange Access Management Policy." The Oregon Transportation Commission also has a policy outlining interchange placement and spacing. The reality of the situation also heavily influences the goal, objectives and criteria, such as local land uses, topography, street patterns and traffic volumes.

The primary purpose for interchanges along Interstate 5 is to provide access between the highest Level of Importance (LOI) roadway (I-5) and communities and statewide or regional level of importance corridors. This access must also be designed for the highest level of safety and mobility. Traffic using the interchange should be regional in nature and local trips should be encouraged to use the local street system, transit or other alternatives. Interchanges should tie into significant local street systems that serve a large area and not merely a specific neighborhood or land use. There should be a local and regional road hierarchy developed that routes traffic from smaller transportation systems to larger systems. Intersections and accesses near the interchange ramp terminals need to be highly regulated to ensure a high level of service through the interchange area. Local streets, therefore, should be spaced at safe and efficient distances from the interchange ramp terminals.

Land uses around interchanges may significantly impact its operations and safety. Therefore, local governments must plan and implement land use patterns that protect the operation of the interchange and provide options for people to use other modes of travel or choose to travel along local streets. The interchange should also serve the needs of pedestrians, bicycles and transit. A redesign of the interchange should be protected and managed for the life of the investment.

The interchange influence area is the area which contains state and local transportation facilities that impact the operations and management of the Creswell/I-5 Interchange. In general, the Goshen/Divide Highway (Highway 99), the Springfield/Creswell Highway

(Oregon Ave. and Cloverdale Road), the accesses along Springfield/Creswell and Goshen Divide Highways and the local streets that intersect the state highways should be considered as part of this influence area.

The Creswell interchange is a significant transportation facility for the City and surrounding area, influencing local traffic patterns especially along Oregon Ave. and Cloverdale Rd. For instance, driveways along Oregon Ave. (Springfield/Creswell Highway) significantly influence the operations of the interchange ramp terminals. Also, a relatively large portion of vacant commercial land on the east side of the interchange will, when developed, impact the interchange. Consequently, it is important to develop an access management plan with the City of Creswell and local property owners that places driveways and local streets a safe distance from the interchange ramp terminals.

The role and function of this interchange should follow closely the policies and standards for Interstate 5 interchanges in the Willamette Valley. Every effort should be made to coordinate with the City of Creswell in their Transportation System Plan to provide a safe and efficient transportation system for all modes of travel while designing a rational street pattern serving property near the interchange. Any interchange alternative chosen by the City of Creswell and ODOT is linked to the outcome of the Creswell Transportation System Plan (TSP).

PROJECT GOAL:

Improve the safety and operation of the interchange and the surrounding state highway transportation system and arterial system, while maintaining the system hierarchy of interstates, state roads, collectors and local streets.

OBJECTIVES:

Conforms to ODOT policies and performance guidelines in the Transportation Planning Rule, the Oregon Highway Plan and the Oregon Transportation Plan.

Coordinate the alternative with the goals and policies of the Creswell Transportation System Plan.

Create an alternative that achieves the aesthetic goals for maintaining the historic scale and pattern of Creswell.

Develop a multi-modal alternative that optimizes safety and mobility while providing reasonable access.

Create an alternative that is fiscally constrained and built in phases.

Coordinate with the Creswell TSP to develop an access management plan for the Springfield-Creswell Highway that resembles the features listed under Access Management Category #5 in the Oregon Highway Plan (OHP)

Optimize the safety and operation of the Creswell Interchange at I-5 through the design of the interchange elements and through access control measures around the interchange.

Investigate the possible solutions at the Highway 99/Oregon Ave. intersection.

DESIGN CRITERIA:

1) Achieve Level of Service (LOS) B on Mainline (I-5), LOS C for ramp merges and diverges on I-5, LOS C for ramp terminals and LOS D along the Springfield Creswell Highway. LOS are for a 2015 design year.
2) Project should be built in phases and phases should be fundable.
3) Concept should accommodate all users of facility (trucks, autos, transit, bikes, pedestrians).
4) Full build-out of the interchange should incorporate the construction of a new structure.
5) Avoid significant environmental impacts.

APPENDIX B

SIGNALIZED INTERSECTION - LEVEL OF SERVICE DESIGNATION

LEVEL OF SERVICE DESIGNATIONS FOR SIGNALIZED INTERSECTIONS

Peak hour volumes at signalized intersections were analyzed to determine a level of service (LOS) for each location. The concept of level of service is a quantitative measure of the ratio between the existing or projected volumes to the capacity of the roadway at a given location. This ratio is known as Volume to Capacity (V/C). The V/C ratios are broken down into six levels and each level is given a letter designation, from A through F, for identification purposes. The level of service designation "A" represents the best level of service while "F" is the worst. The table below shows the LOS designations for signalized intersections.

Level of Service Designations for Signalized Intersections

Level of Service	Traffic Flow	Comments	Maneuverability
A Desirable	Free	Traffic flows freely with no delays.	Drivers can maneuver easily and find freedom in operation.
B Desirable	Stable	Traffic still flows smoothly with few delays.	Some drivers feel somewhat restricted within groups of vehicles.
C Desirable	Stable	Traffic generally flows smoothly but occasionally vehicles may be delayed through one signal cycle. Desired urban area design level.	Backups may develop behind turning vehicles. Most drivers feel somewhat restricted.
D Acceptable	Approaching Unstable	Traffic delays may be more than one signal cycle during peak hours but excessive back-ups do not occur. Considered acceptable urban area design level.	Maneuverability is limited during short peak periods due to temporary back-ups.
E Unsatisfactory	Unstable	Delay may be great and up to several signal cycles. Short periods of this level may be tolerated during peak hours in lieu of the cost and disruption attributed to providing a higher level of service.	There are typically long queues of vehicles waiting upstream of the intersections.
F Unsatisfactory	Forced	Excessive delay causes reduced capacity. Always considered unsatisfactory. May be tolerated in recreational areas where occurrence is rare.	Traffic is backed up from other locations and may restrict or prevent movement of vehicles at the intersection.

APPENDIX C

UNSIGNALIZED INTERSECTION - LEVEL OF SERVICE DESIGNATION

LEVEL OF SERVICE DESIGNATION FOR UNSIGNALIZED INTERSECTIONS

Peak hour volumes at unsignalized intersections were analyzed to determine a level of service (LOS) for each location. The concept of level of service is a quantitative measure using the Reserve Capacity of the intersection. Reserve Capacity is equal to the capacity of a lane at an unsignalized intersection minus the demand volume for that lane. The Reserve Capacities are broken down into six levels and each level is given a letter designation, from A through F, for identification purposes. The level of service designation "A" represents the best level of service while "F" is the worst. All volumes are stated in passenger cars per hour (pcph). The table below shows the LOS designations for unsignalized intersections.

These levels of service only apply to traffic flows that must either stop or yield at an unsignalized intersection. Left-turns from the mainline and all side-street traffic is effected. The through traffic on the mainline is generally unaffected, until the other movements approach capacity and create a safety concern.

Level of Service Designations for Unsignalized Intersections

Level of Service	Comments	Reserve Capacity
A Desirable	Little or no traffic delays.	Reserve Capacity is greater than 400 pcph.
B Desirable	Short traffic delays.	Reserve Capacity is between 300 and 399 pcph.
C Acceptable	Average traffic delays.	Reserve Capacity is between 200 and 299 pcph.
D Tolerable	Long Traffic delays.	Reserve Capacity is between 100 and 199 pcph.
E Undesirable	Very long traffic delays. Approaching Capacity. Small disruption may cause intersection failure.	Reserve Capacity is between 99 and 0 pcph.
F Unsatisfactory	Extreme traffic delays. Demand volume has exceeded lane capacity, and queuing may cause congestion affecting other traffic movements in the intersection.	No Reserve Capacity.

Appendix E
Concepts Studied

Concepts not Advanced

Interchange Ideas

Initially, five design concepts were created and evaluated, but not advanced. An additional two design concepts were studied for Concept 1 for the Goshen-Divide bridge.

Three of these concepts, regarding interchange designs, were reviewed by ODOT staff and not advanced for public review. Two of the concepts (Local Street Ideas) were presented at an Open House (April 97), reviewed and evaluated, and then rejected for not meeting project objectives and criteria.

The two additional bridge designs (Concept 1-1, and Concept 1-2) were presented to the Creswell and Lane County Planning Commissions, and Creswell City Council and Lane County Board of Commissioners and not advanced after hearings and work sessions. The ideas were for discussion purposes and exhibited possible locations for a bridge. The new locations added about 4 million to the costs.

Three Interchange Designs Reviewed by ODOT and Rejected

1. Half Cloverleaf with Slip Ramps and Melton Road Realignment (Figure 1)

Description

This concept reconfigured the existing loop ramps. The new configuration is similar to the existing interchange design with the following changes:

1. The southbound loop entrance ramp will be a free-flow movement from the west end of the I-5 undercrossing structure with a slip ramp that will connect the Springfield – Creswell Highway with the southbound loop entrance ramp.
2. The intersection of the Springfield-Creswell Highway and Melton Road would be moved east of Zinker Lane. The north realignment of Melton Road would occur next to Garden Lake Park.
3. The southbound ramp terminal is moved 70 meters east of its current location.
4. The ramp terminals will be signalized when necessary.

Reasons for not advancing the concept

- Traffic from the slip ramp to the free-flow southbound loop entrance ramp creates a potentially unsafe condition because of the short weave distance.
- The storage distance for the northbound left turn between the ramp terminals to I-5 is inadequate.
- Would not achieve signal progression at the ramp terminals.

2. Standard Diamond with Loop Ramps (Figure 2)

Description

This concept would operate similar to the existing interchange configuration except the southbound ramp terminal would be moved east of its current location. Directional entrance ramps will be added in the northeast and southwest quadrants.

Reason for not advancing the concept

- Northbound entrance ramp was found to be unnecessary.
- High likelihood of 4f impact to Garden Lake Park because of Melton Road realignment.

3. Tight Diamond (Figure 3)

Description

This concept would accommodate all moves similar to a standard diamond. The ramp terminals are brought in as close to I-5 as possible to maximize the distance from the terminals to existing accesses primarily on the west side.

Reasons for not advancing the concept

- The northbound entrance ramp was not necessary based on the anticipated traffic projections.
- The additional signal phase to accommodate the northbound left turn would degrade the ramp terminal LOS.
- Could not achieve signal progression at the ramp terminals.
- Inadequate storage distance between ramp terminals for left turn movements to the entrance ramps.

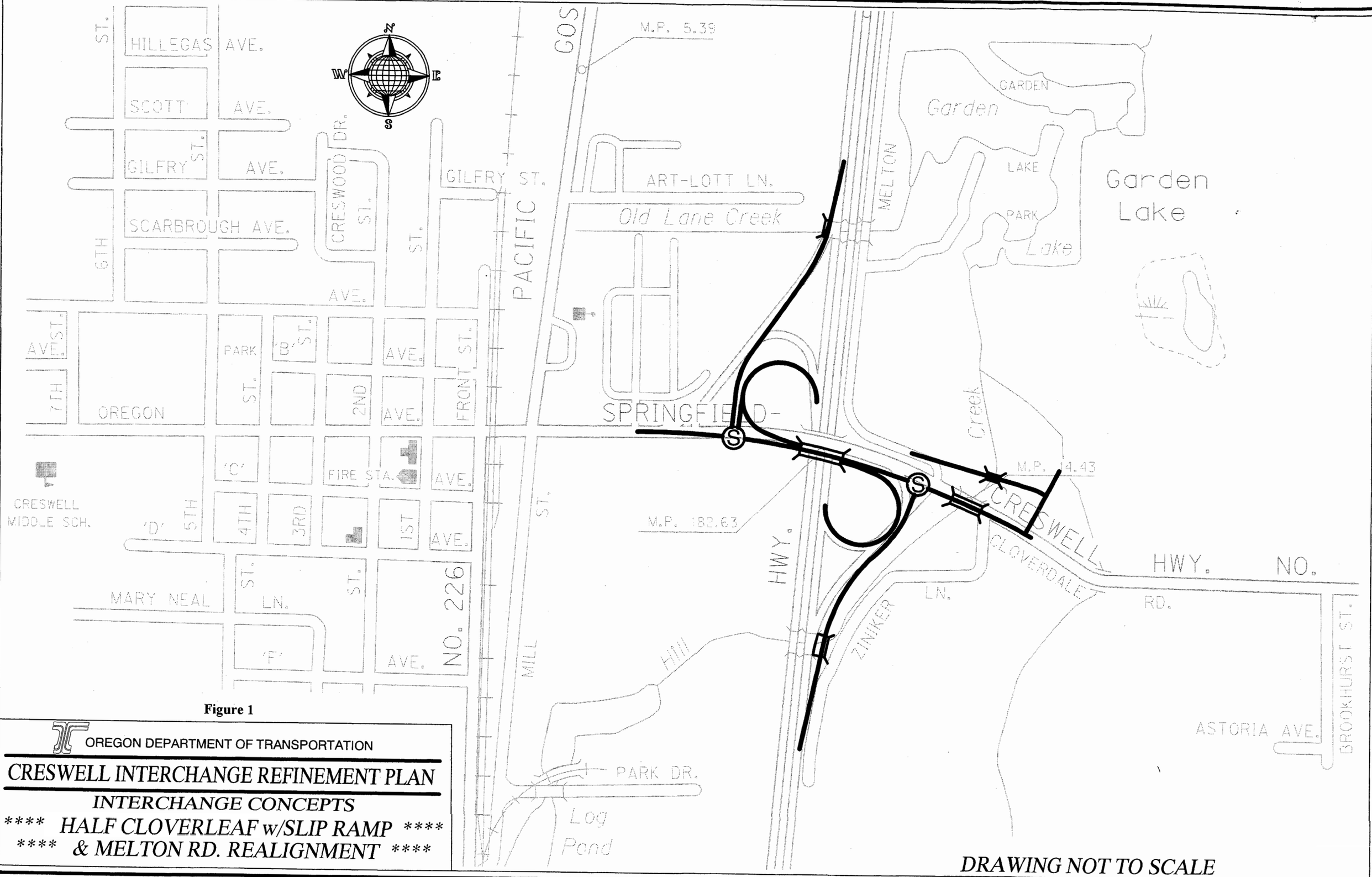


Figure 1

OREGON DEPARTMENT OF TRANSPORTATION

CRESWELL INTERCHANGE REFINEMENT PLAN

INTERCHANGE CONCEPTS

**** HALF CLOVERLEAF w/SLIP RAMP ****
**** & MELTON RD. REALIGNMENT ****

DRAWING NOT TO SCALE

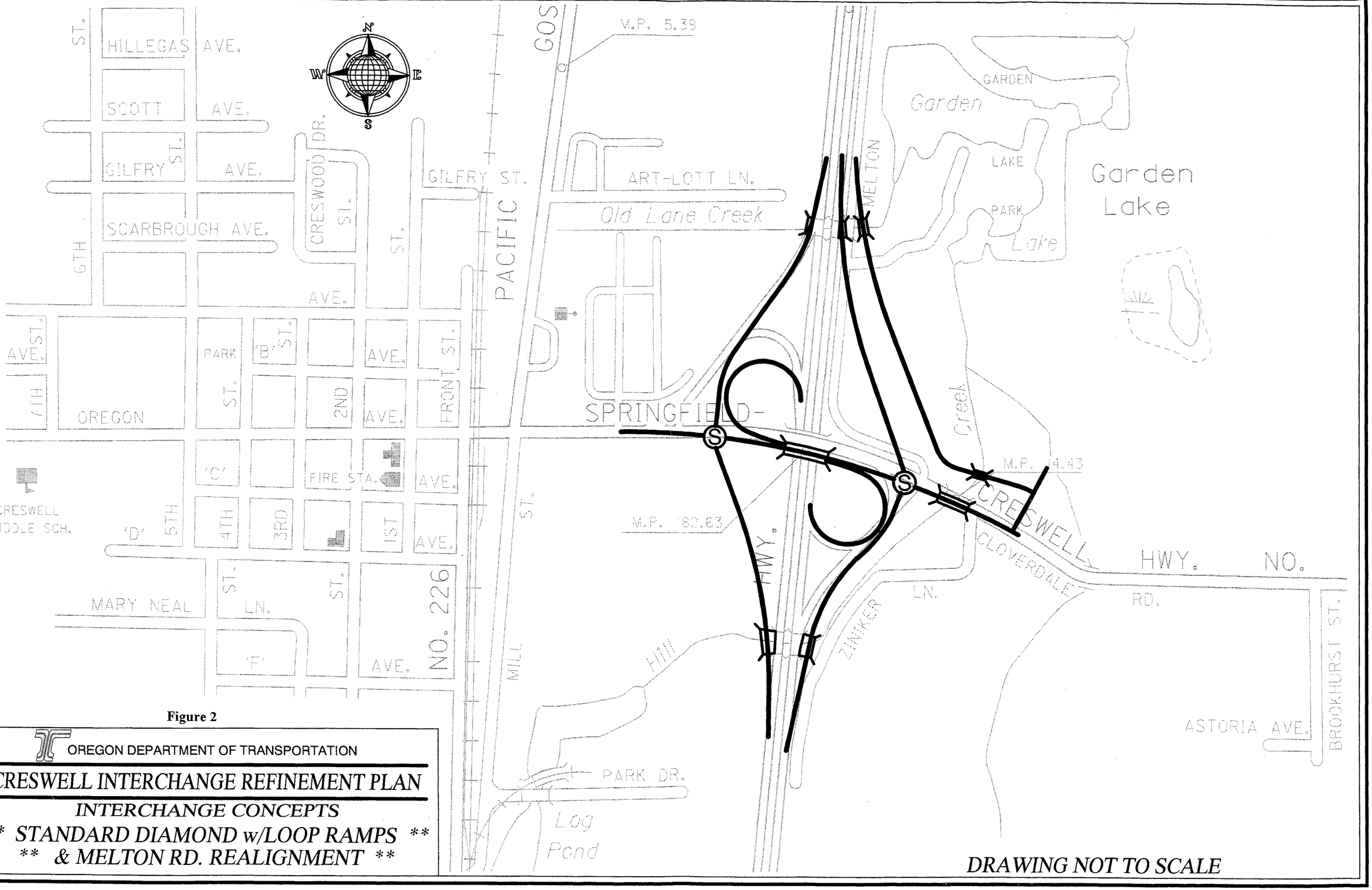


Figure 2

OREGON DEPARTMENT OF TRANSPORTATION

CRESWELL INTERCHANGE REFINEMENT PLAN

INTERCHANGE CONCEPTS

** STANDARD DIAMOND w/LOOP RAMPS **

** & MELTON RD. REALIGNMENT **

DRAWING NOT TO SCALE

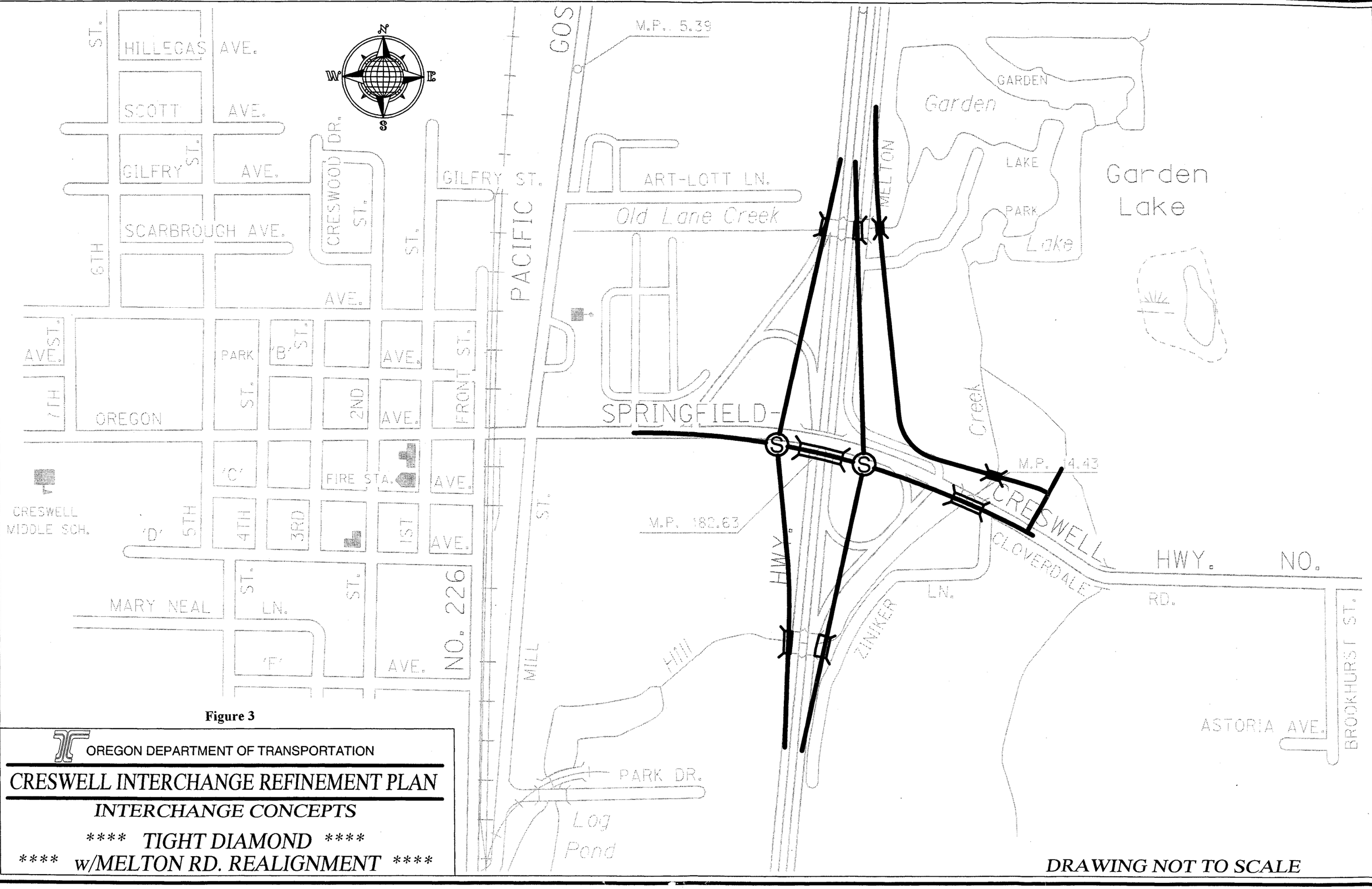


Figure 3

OREGON DEPARTMENT OF TRANSPORTATION

CRESWELL INTERCHANGE REFINEMENT PLAN

INTERCHANGE CONCEPTS

**** TIGHT DIAMOND ****

**** w/MELTON RD. REALIGNMENT ****

DRAWING NOT TO SCALE

Two Local Street Ideas/Concepts Presented at April 29, 1997 Open House

Two concepts, concerning local street connections near the Goshen-Divide/Oregon Ave. intersection were presented at an April 29, 1997 Open House in Creswell. After input from the public and review of the design objectives and criteria by ODOT, these concepts were removed from further consideration. Essentially, these ideas failed to improve traffic operations along Oregon Ave. to the interchange, and the anticipated impacts to businesses would have made local support for the concepts difficult. The storage distances needed to the interchange were inadequate . The concepts:

Intersection Concept 1 (Major Alignment of Goshen-Divide: Figures 4 and 5)
Concept 1 realigned the northern portion of Goshen-Divide Highway to form a "T" intersection with Oregon Avenue approximately 85 meters (250 feet) east of the existing location. The existing Goshen-Divide Highway traffic movement will be right in/out with full access from Mill Street to Oregon Avenue. Front Street was proposed to be "cul-de-saced" just north of Oregon Avenue.

Cost Summary
Cost: $10.0 million
Construction Cost: $2.5 million (Oregon Avenue)
$7.5 million (Interchange)

Intersection Concept 2 (Minor Alignment of Goshen-Divide Figures 6 and 7)
Concept 2 realigns the northern portion of Goshen-Divide Highway to form a "T' intersection with Oregon Avenue approximately 20 meters (65 feet) east of the existing location. The northern portion of Mill Street is realigned to serve as an access to the Shopping Center in lieu of an access to Oregon Avenue. Like Concept 1, Front Street would be "cul-de-saced" just north of Oregon Avenue.

Cost Summary
Cost: $10.0 million
Construction Cost: $2.5 million (Oregon Avenue)
$ 7.5 million (Interchange)

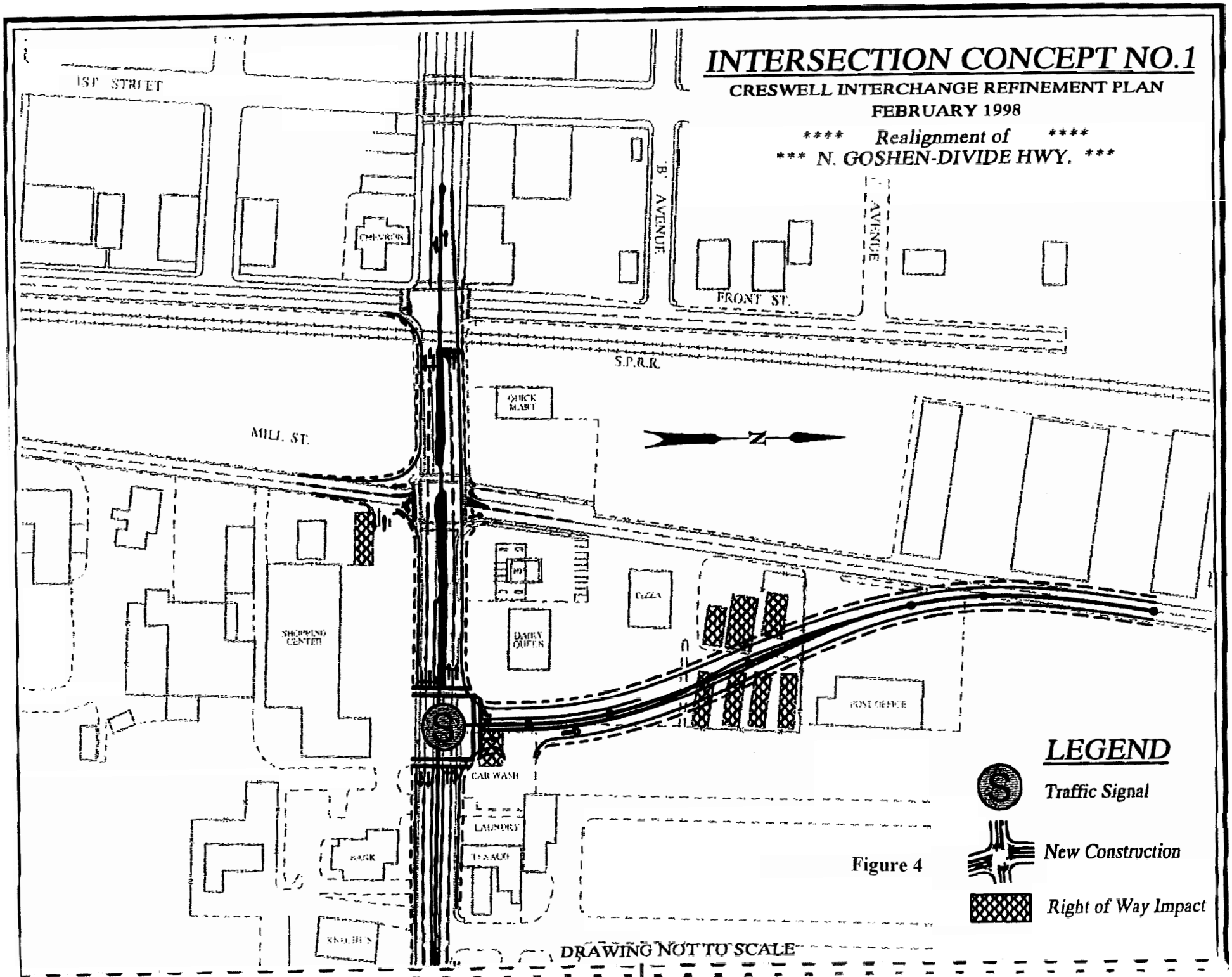
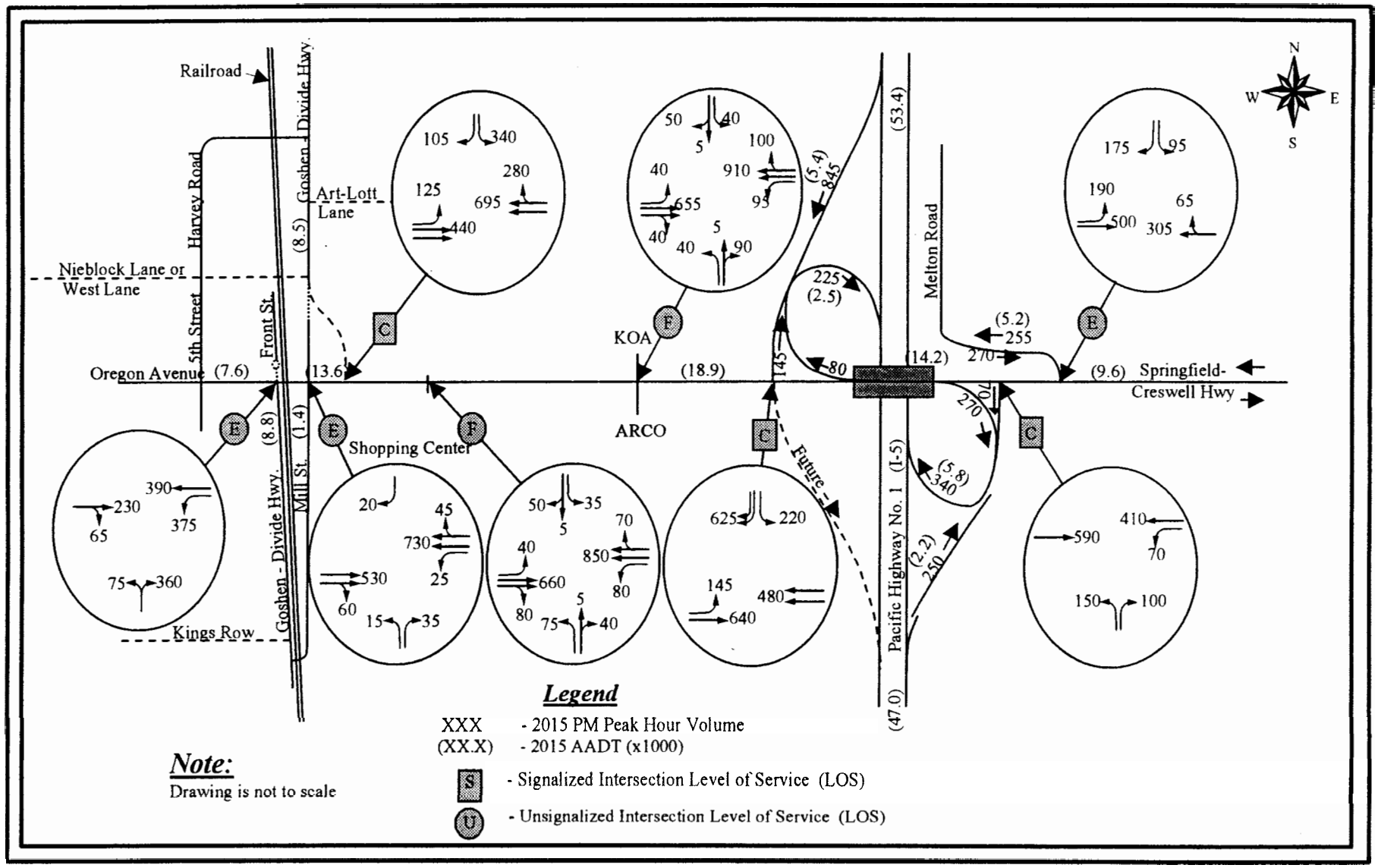

INTERSECTION CONCEPT NO.1
CRESWELL INTERCHANGE REFINEMENT PLAN
FEBRUARY 1998
**** Realignment of ****
*** N. GOSHEN-DIVIDE HWY. ***
1ST STREET
'B' AVENUE
AVENUE
FRONT ST.
S.P.R.R.
MILL ST.
QUICK MART
SHOPPING CENTER
DAIRY QUEEN
CAR WASH
LAUNDRY
TEXACO
BANK
KNOBEN
POST OFFICE
LEGEND
Traffic Signal
New Construction
Right of Way Impact
DRAWING NOT TO SCALE

Figure 4



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, Intersection Concept 1 - Includes TSP Extensions 2015 Design Hour Volumes (April 97 Open House)	FILE : Creswell-2.PPT	Prepared By: Harlan Nale	Figure 5
	DATE : 11/26/97	Reviewed By: Brian Dunn	

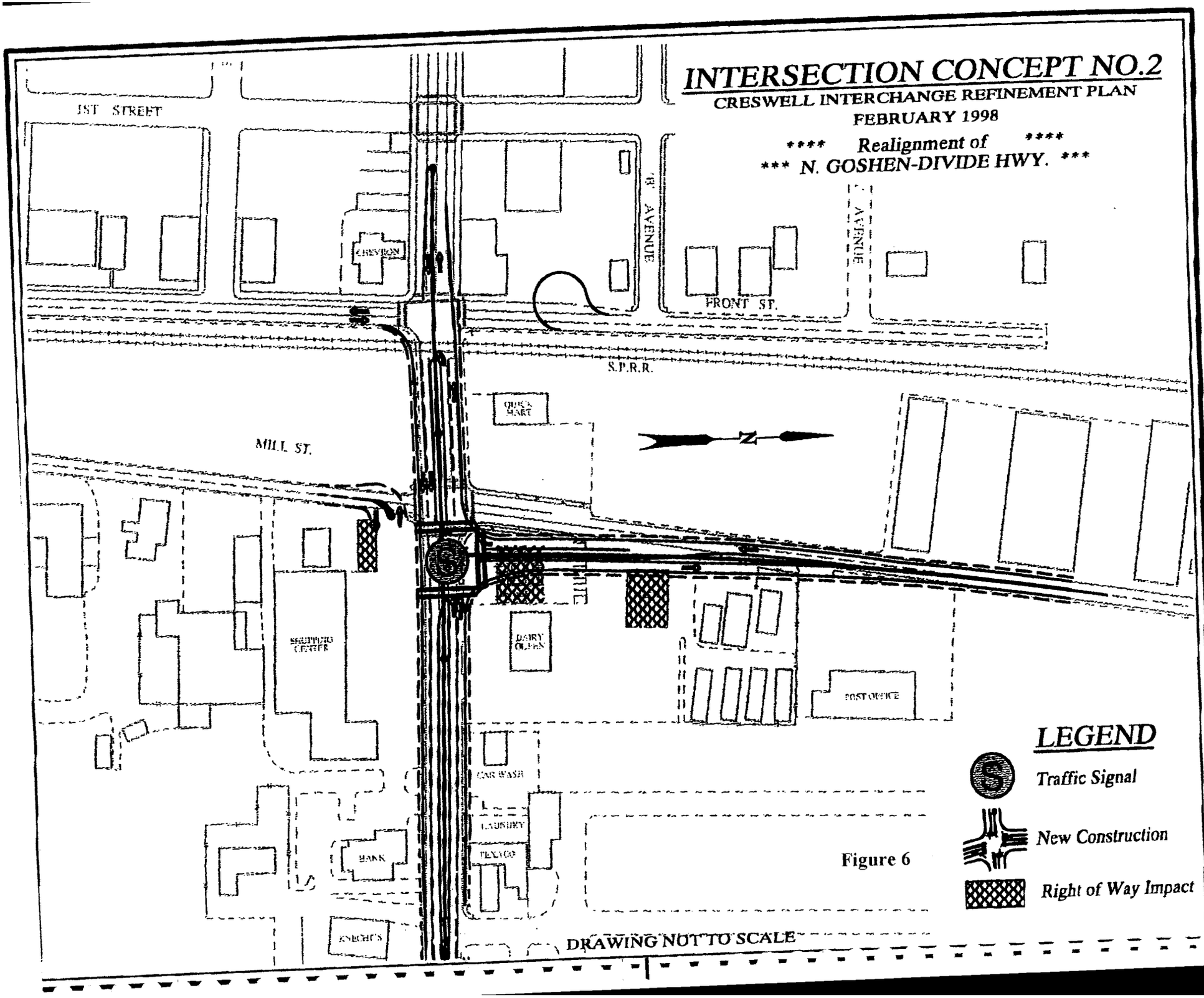
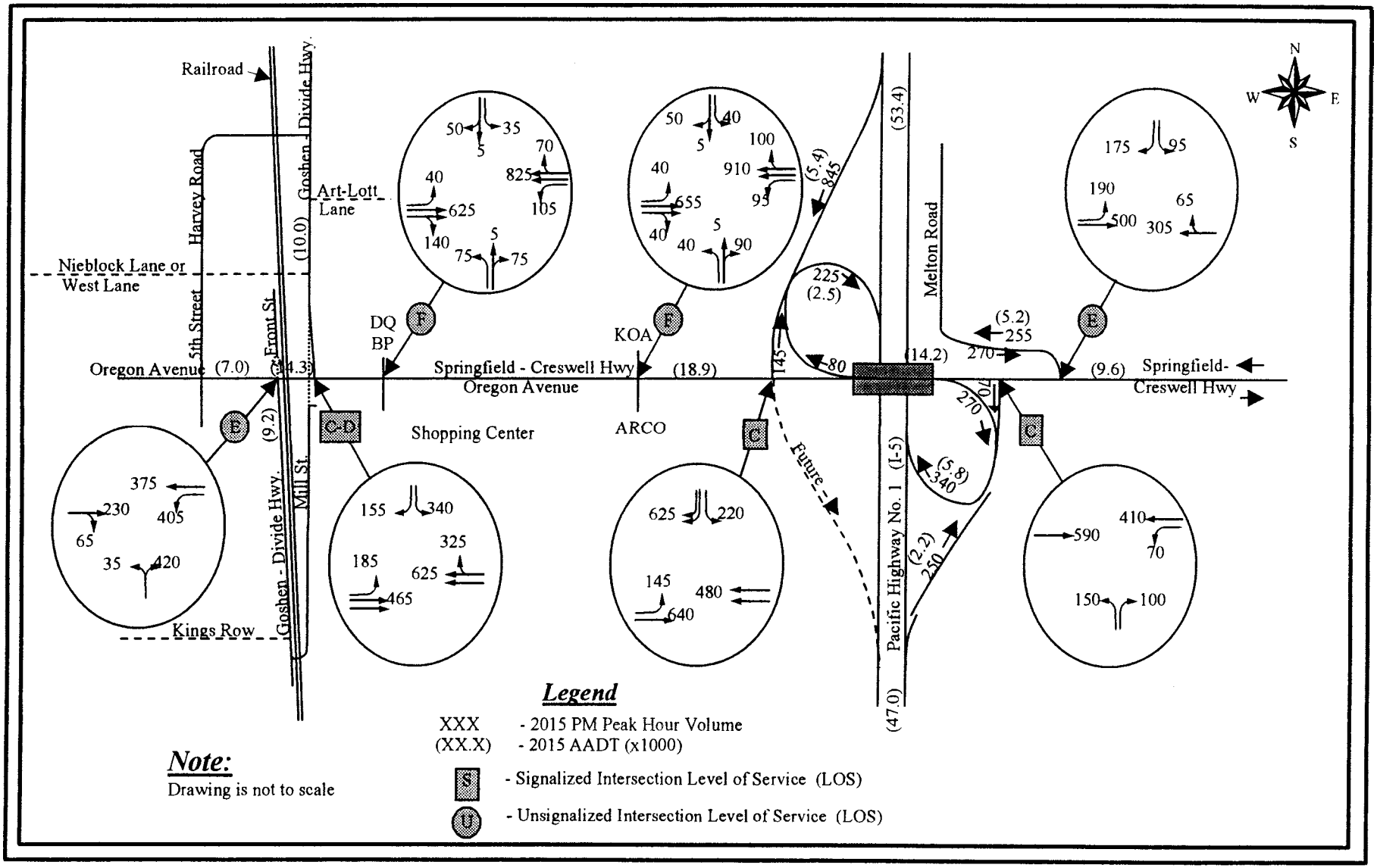

INTERSECTION CONCEPT NO.2
CRESWELL INTERCHANGE REFINEMENT PLAN
FEBRUARY 1998
**** Realignment of ****
*** N. GOSHEN-DIVIDE HWY. ***
1ST STREET
MILL ST.
FRONT ST.
S.P.R.R.
AVENUE
AVENUE
CHEVRON
QUICK MART
DAIRY QUEEN
POST OFFICE
SHOPPING CENTER
CAR WASH
LAUNDRY
TEXACO
BANK
KNIGHT'S
N
LEGEND
Traffic Signal
New Construction
Right of Way Impact
DRAWING NOT TO SCALE

Figure 6



OREGON DEPARTMENT OF TRANSPORTATION

TPAU TRANSPORTATION PLANNING ANALYSIS UNIT

Creswell Refinement, Intersection Concept 2 - Includes TSP Extensions **2015 Design Hour Volumes (April 97 Open House)**	FILE : Creswell-2.PPT	Prepared By: Harlan Nale	**Figure 7**
	DATE : 12/11/97	Reviewed By: Brian Dunn	

Table 1: Year 2015 Levels of Service (LOS) for April 28, 1997 Open House Concepts 1 and 2.

Intersection	Build Concepts (With Future Extensions)			
	Unsignalized		Signalized	
	Concept 1	Concept 2	Concept 1	Concept 2
Melton Road at Springfield-Creswell Highway	E	E	----	----
Northbound Freeway Ramps at Springfield-Creswell Highway	----	----	C	C
Southbound Freeway Ramps/Arco Station Access at Oregon Avenue	----	----	C	C
KOA Access at Oregon Avenue	F	F	----	----
BP Station/Shopping Center Accesses at Oregon Avenue	F	F	----	----
Realigned Goshen-Divide Highway Street at Oregon Avenue	----	----	C	C-D
Mill Street at Oregon Avenue	E	----	----	----
Southern Goshen-Divide Highway at Oregon Avenue	E	E	----	----

*The LOS shown in this table assumes that traffic queues from adjacent intersections do not cause adverse effects on intersection operation. If traffic queues from a "closely-spaced" intersection blocks the operation of the intersection that is being analyzed, the resulting LOS will probably be LOS F.

Both Concept 1 and Concept 2 maintained "full" access to the KOA access from Oregon Avenue. Safety was improved at the KOA access/Oregon Avenue Intersection by eliminating the "free right" at the southbound freeway ramp terminal and increasing the distance between the southbound freeway ramp terminals and the KOA Access/Oregon Avenue Intersection. Both concepts would stop vehicles on the southbound freeway off-ramp turning west onto Oregon Avenue. The existing "free right" could have remained if the KOA access was either closed or was converted to a right in/out access.

Neither Concept 1 or 2 provided acceptable signal spacing. The proposed intersection improvements in these concepts (Goshen-Divide Highway at Oregon Avenue) did not meet the goals and objectives for the Plan. Specifically, the objective to "Develop an access management plan along the Springfield/Creswell Highway (Oregon Avenue and Cloverdale Road) that incorporates the Access Category #5 in the Oregon Highway Plan".

Category 5 of the Access Management Classification System table shows that 400 meters (1/4 mile) spacing is needed between traffic signals on Oregon Avenue. If a Goshen-Divide Highway/Oregon Avenue intersection is signalized, there would be three traffic signals within a distance of 400 meters (1/4 mile). Three traffic signals at this spacing on Oregon Avenue would cause both unacceptable delay and disruptions to through traffic flows. The only time it is acceptable to space traffic signals less than 400 meters apart is

when it is necessary to optimize capacity and safety. In this case, both capacity and safety will be sacrificed due to the inadequate traffic signal spacing.

Two additional bridge ideas for Concept 1 that were proposed during discussions with the Creswell and Lane County Planning Commissions and the Creswell City Council and Lane County Board of Commissioners.

Concept 1-1 (Long alignment of bridge). Cost of the bridge would add another 4 million to the cost. Possible environmental impacts to stream and open water; an assessment was not taken.

Concept 1-2 (Mill alignment of bridge). Cost would remain the same. Right-of-way impacts would occur to Industrial site (Lumber Company).

KINGS ROW

OREGON AVENUE

CLOSED

CLOSED

FRONT ST.

GOSHEN - DIVIDE HIGHWAY

MILL ST.

SOUTHERN PACIFIC RAILROAD

SUGGESTED LOCATION FOR LOCAL ACCESS POINT

GOSHEN - DIVIDE HIGHWAY

POST OFFICE

SUGGESTED LOCATION FOR LOCAL ACCESS POINT

MARKET ROAD

KOA

PACIFIC HIGHWAY (I-5)

ZINKER LANE

MELTON ROAD

CONCEPT 1-1

CRESWELL INTERCHANGE REFINEMENT PLAN
SEPTEMBER 30, 1997

**** *Major Realignment of* ****
*** *S. GOSHEN-DIVIDE HWY.* ***
*** *Railroad Grade Separation* ***

LEGEND

- Traffic Signal
- New Construction
- Right of Way Impact
- Bridge

KINGS ROW

OREGON AVENUE

CLOSED

GOSHEN - DIVIDE HIGHWAY

CLOSED

MILL ST.

SOUTHERN PACIFIC RAILROAD

FRONT ST.

GOSHEN - DIVIDE HIGHWAY

SUGGESTED LOCATION FOR LOCAL ACCESS POINT

POST OFFICE

SUGGESTED LOCATION FOR LOCAL ACCESS POINT

MARKET ROAD

PACIFIC HIGHWAY (I-5)

KOA

ZINKER LANE

MELTON ROAD

CONCEPT 1-2

CRESWELL INTERCHANGE REFINEMENT PLAN
SEPTEMBER 30, 1997

**** Major Realignment of ****
*** S. GOSHEN-DIVIDE HWY. ***
*** Railroad Grade Separation ***

LEGEND

- Traffic Signal
- New Construction
- Right of Way Impact
- Bridge