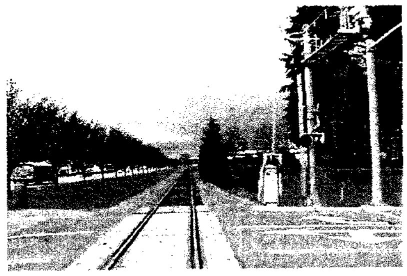
Final Report

Scappoose Rail Corridor Study



Scappoose, Oregon

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Project No. 5225.00

October 2002

(Language to be omitted is ~~strikethrough~~, proposed language additions are in **bold italics**):

POLICIES FOR TRANSPORTATION

[…]

5) Work with ~~Burlington Northern Railroad~~ ***private rail companies and the Oregon Department of Transportation Rail Division*** to improve the safety at railroad crossings.

[…]

13) ~~Minimize the interruption on Highway 30 of the traffic flow~~ ***Control street intersections, rail crossings, and the construction of industrial, commercial and residential drives at the Columbia River Highway (Highway 30) per the plans and policies detailed within the Oregon Highway Plan, the Scappoose Transportation System Plan, the Scappoose Rail Corridor Study, and the Scappoose Public Works Design Standards and Specifications in order to regulate traffic patterns*** and promote safety. The means to do this shall include***, but is not limited to***: ***closing, combining***, ***or*** limiting the number of access points; encouraging safe set backs from the ***highway and rail corridor*** right-of-way; encouraging the ***construction*** ~~clustering~~ of ~~activities~~ ***planned development centers or "cluster" developments;*** and***,*** utilizing frontage roads and access collection points as much as possible.

Acknowledgements

This project would not have been possible without the representation of each of the local transportation service providers as well as the community at large. A Technical Advisory Committee (TAC) and a Public Advisory Committee (PAC) guided the consultant team in its analysis. The TAC provided the project team with technical guidance and review and was composed of representatives from the City of Scappoose, the Portland & Western Railroad (PNWR), the Oregon Department of Transportation (ODOT) Rail Division, and the ODOT Highway Division. The PAC was formed of volunteer citizen representatives and worked to provide the project team with insights regarding the community's near-term needs as well as its vision for the future. In addition to direction provided by the TAC and PAC members, community insights and participation were solicited through two public meetings.

Key community members, jurisdiction staff, and consultant team members who contributed to the project through their participation on the TAC, PAC, and project team follow:

Technical Advisory Committee

Jon Hanken
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Betty Butzer
Community & Business Representative

Donna Gedlich
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Chapter 1

Introduction

Chapter 1 – Introduction

As the City of Scappoose enters the 21st century, it faces growth and transportation issues unresolved by 20th century efforts. Both local and regional population growth have increased the travel demand created by community residents and through traffic on U.S. Highway 30 within the city. Over the years, residential growth and commercial development patterns have led to an ever-increasing travel demand on east-west roadway connections across the Portland & Western Railroad (PNWR) corridor.

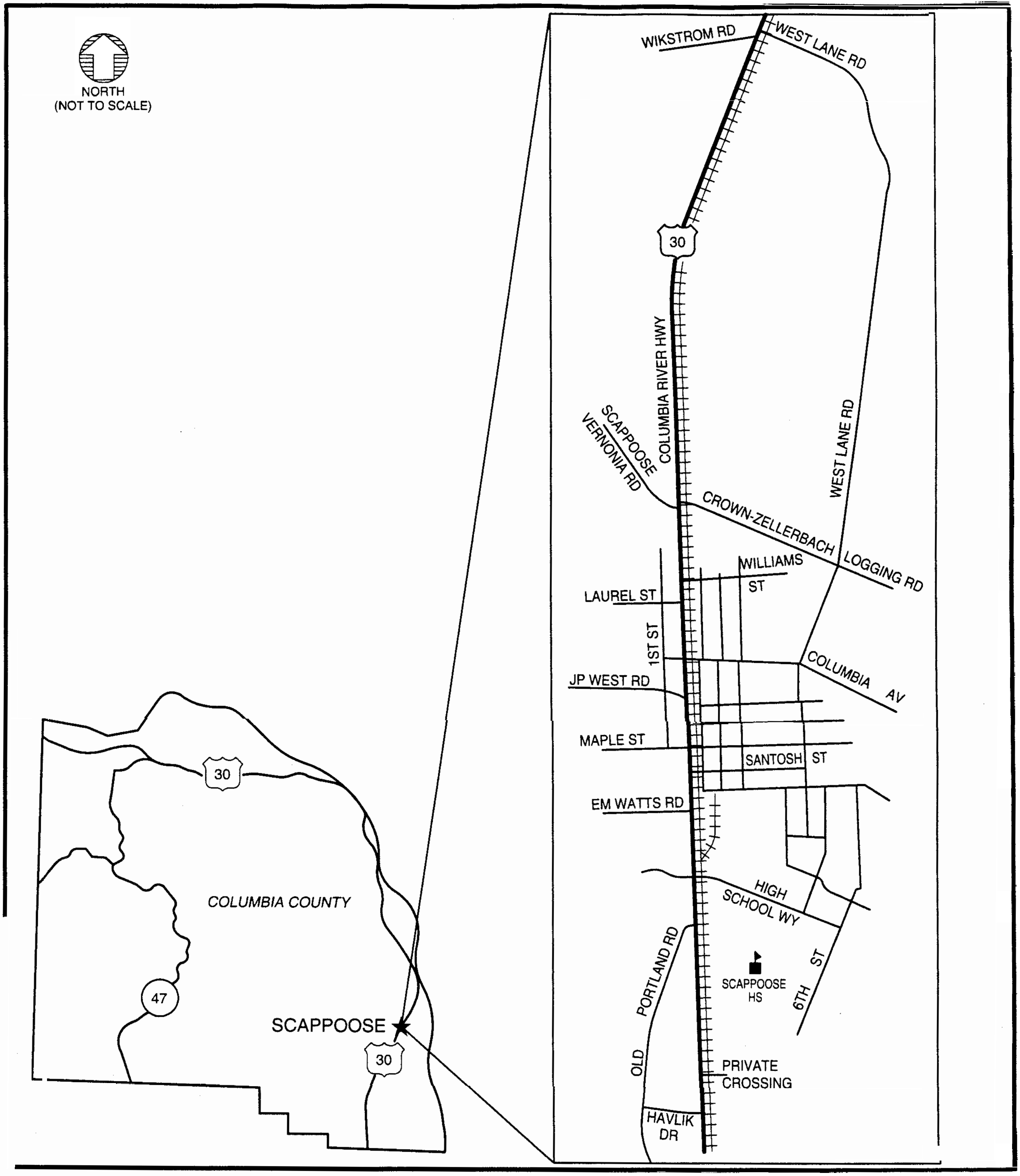
Recent attempts to upgrade crossings such as the proposed Havlik Road Extension have ended without action as a result of a lack of consensus regarding the need for individual crossings. Previous improvement project proposals have been hampered by the conflicting desire to provide additional east-west roadway capacity while trying to consolidate or eliminate the number of at-grade highway/rail grade crossings.

PROJECT BACKGROUND

This study provides a comprehensive review of highway/rail grade crossing geometric and operational opportunities and constraints. These opportunities and constraints have been developed to address the needs of the City of Scappoose, PNWR, ODOT, and Columbia County. Through a six-month planning process, the community and its transportation service providers have crafted a preferred alternative with specific recommendations for each study grade crossing as well as several local access and circulation improvements. This final report provides the City, PNWR, and ODOT with a framework for future reconstruction and development projects as well as a tool with which to leverage grants and other funding sources to complete the necessary infrastructure construction and reconstruction.

Study Area

The study area encompasses the highway/railroad grade crossings located between milepost 20.24 and 22.49 on Highway 30 and rail post 126.8 and 124.1 on the PNWR rail line (roughly between Havlik Drive to the south and West Lane Road to the north). Figures 1-1 and Figure 1-2 provide a site vicinity map and an aerial photograph of the study area, respectively.



SITE VICINITY MAP

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Scappoose, Oregon **October 2002**

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FIGURE 1-1

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LEGEND

- SIGNALIZED STUDY INTERSECTION
- UNSIGNALIZED INTERSECTION
- STUDY AREA LIMIT

AERIAL PHOTO OF STUDY AREA

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Scappoose, Oregon October 2002

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FIGURE 1-2

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Project Methodology

To kick-off the project, a joint meeting of the PAC and TAC was held to introduce the project team, become acquainted with all of the project participants, and determine what key issues and concerns the various participants had at the project start. After the joint PAC/TAC meeting, existing highway/rail grade crossings in the defined study area were reviewed. This existing conditions assessment identified current study corridor conditions, including the operational and geometric characteristics of each of the roadways and highway/rail grade crossings within the study area. The purpose of this effort was to provide a basis for comparison to future conditions.

As part of the existing conditions assessment, the project team conducted traffic counts at key roadway intersections and at each crossing. In addition to the traffic volume, a full operational analysis of study intersections along Highway 30 was conducted to evaluate the current performance of each intersection and how it relates to the adjacent grade crossings. The analysis included an evaluation of level of service, volume/capacity, and queuing. On the rail side, the existing conditions assessment included an analysis of the existing horizontal and vertical profile of the railroad with respect to the roadways, existing train usage, and existing improvement needs/issues.

After meeting with the TAC to present an overview of existing conditions, the project transitioned into an assessment of year 2025 future conditions. The 2025 analysis forecast how the study area's transportation system would operate in the future. The 2025 scenario assumed build-out of anticipated development activities as envisioned by the City's Transportation System Plan (TSP) and Comprehensive Plan as well as the PNWR's long-term system plan and infrastructure needs. The future conditions assessment provided the affected jurisdictions and community with an understanding of both the rail and roadway traffic volume demands and patterns in the area under two growth scenarios. This information was presented to a joint meeting of the PAC and TAC as well as at a public meeting. As a result of these meetings, additional insights and community concerns were discussed and recorded.

With near- and long-term congestion and circulation issues identified, the project transitioned into an assessment of opportunities and constraints. The opportunities and constraints assessment focused on the identification of infrastructure necessary to maintain the status quo and, alternatively, to accommodate the expansion, consolidation, or closure of specific highway/rail grade crossings. The analysis analyzed the impacts of grade crossing changes to both roadway and rail users and included a financial analysis of order-of-magnitude costs associated with various improvement alternatives. Multiple improvement alternatives were examined, including modifications to and/or closure of existing crossings, installation of new railroad grade crossings, realignment of roadways, realignment of the railroad corridor, and grade separation. As the alternatives were developed and evaluated, several factors were considered, including:

- Impacts to pedestrian, bicycle, and vehicular travel patterns and their relationship to connectivity goals identified in the City's TSP and perceived by the public;
- Impacts to emergency vehicle access;
- Impacts to local school bus and freight delivery/truck routes;
- Impacts to railroad switching, staging, and through movement operations;
- Opportunities for consolidation of existing crossings and the impact of closure on adjacent crossings;
- Impacts to traffic signal operations, interconnect with railroad signal equipment, and side street queuing along U.S. 30;
- Right-of-way needs and constraints associated with improvement alternatives; and
- Both the cost and construction feasibility of identified improvement alternatives.

The findings of the opportunities and constraints assessment were presented to the PAC and TAC for review, comment, and selection. After carefully deliberating the advantages and disadvantages of each alternative, the combined PAC and TAC selected the alternatives that were to become components of the preferred plan. The project team then developed a draft preferred plan and implementation timeline for review by the PAC and TAC. After the final joint meeting of the PAC and TAC, the entire project was presented to the community through a second public meeting.

Based on the direction provided by the PAC, TAC, and community comment at the two public meetings, a final preferred alternative was prepared by the project team and is documented in this report. The preferred alternative identifies a long-term vision for the study rail corridor and the improvement projects necessary to achieve that vision. The preferred alternative includes concept level design drawings as well as corresponding cost estimates.

IMPROVEMENT ALTERNATIVE GUIDELINES

To provide direction to the project and ensure that all ideas were evaluated without bias, the members of the PAC and TAC jointly developed the following list of guidelines to use in evaluating project alternatives:

- Guideline 1 - Provide safe and effective multi-modal accessibility to existing and future developments consistent with the City's Comprehensive Plan.
- Guideline 2 - Maintain or enhance existing rail operations and safety.
- Guideline 3 - Provide highway users with a level of mobility and safety consistent with the 1999 Oregon Highway Plan, recognizing the character and function of Highway 30 within the study corridor.
- Guideline 4 - Enhance pedestrian, bicycle, and vehicle safety.
- Guideline 5 - Enhance emergency access/response.
- Guideline 6 - Promote east-west connectivity.
- Guideline 7 - Reduce use of Highway 30 for local circulation/develop alternative north-south frontage roads.
- Guideline 8 - Meet American Association of State Highway and Transportation Officials (AASHTO) design standards at rail grade crossings.
- Guideline 9 - Provide for future heavy rail shipping needs.
- Guideline 10 - Provide for future commuter rail.
- Guideline 11 - Minimize rail/vehicular conflicts.
- Guideline 12 - Miimize project impacts to local businesses and residents.

Report Stucture

This report documents each of the major project elements, including an assessment of existing and forecast future conditions, the alternatives analysis, and the components of the preferred plan. In addition to providing the community and affected agencies with a blueprint for both near- and long-term corridor improvement projects, the report can be used to support the pursuit of state and federal grant monies for improvement projects along the corridor.

The report is divided into five chapters:

- Chapter 1 - Introduction
- Chapter 2 - Existing Conditions Assessment
- Chapter 3 - Future Conditions Assessment
- Chapter 4 - Alternatives Analysis
- Chapter 5 - Preferred Plan

A stand-alone technical appendix is available that provides documentation of traffic count data, operational analyses, and the public involvement process.

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Chapter 2

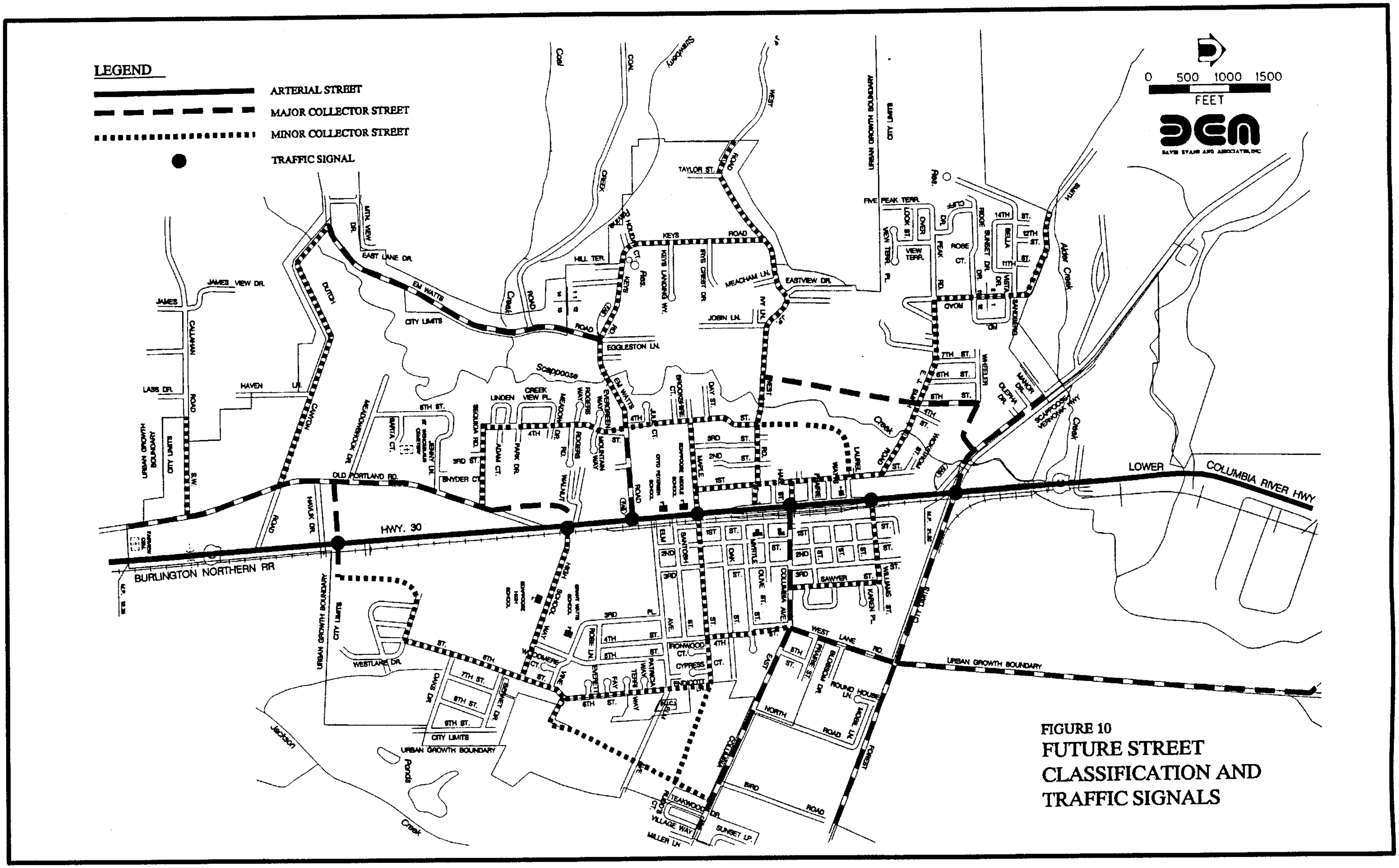
Existing Conditions Assessment

Chapter 2 – Existing Conditions Assessment

The existing conditions assessment identifies study roadway and railroad facilities and documents the current operational and geometric characteristics of the facilities. The purpose of the existing conditions assessment was to provide a basis of comparison to future conditions that are documented later in this report. The material presented in this chapter was based in part on field visits conducted by the project team in April 2002 to identify the existing physical and operational characteristics of the study roadways, railroad, and rail crossings.

Existing Roadway Facilities

Roadway system hierarchy and classification are based on two major roadway characteristics: access and mobility. Higher order facilities, such as freeways and highways, are intended to function as high speed and high volume (i.e., high mobility) roadways. As such, they typically offer very limited access to lower order facilities and adjacent local land uses (i.e., low accessibility). Conversely, the primary function of lower order facilities, such as collector and local streets, is to provide a higher degree of accessibility, with less emphasis on mobility and capacity of operations. Table 2-1 is a summary of the existing roadway facilities and amenities within the study corridor. Figure 2-1 is an illustration of the existing functional classification system of the roadways within the City of Scappoose.



SOURCE: SCAPPOOSE TRANSPORTATION SYSTEM PLAN, 1997.

EXISTING FUNCTIONAL CLASSIFICATION MAP

Scappoose Rail Crossing Corridor Study
Scappoose, Oregon — October 2002

FIGURE 2-1

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Table 2-1
Existing Transportation Facilities and Amenities

Street	Classification	Cross Section*	Posted Speed	Sidewalks	Bike Lanes	On-Street Parking
Highway 30	Statewide Highway	5 Lanes	45 mph**	Both Sides (some gaps)	Both Sides	West Side (down town)
Havlik Drive	Major Collector	3 Lanes	NP	Both Sides	No	No
Columbia Avenue	Major Collector	2 Lanes	25 mph	Both Sides	No	Both Sides
Scappoose-Vernonia Road	Major Collector	2 Lanes	45 mph	No	No	No
Crown-Zellerbach Logging Road***	Major Collector	2 Lanes	NP	No	No	No
West Lane Road	Major Collector	2 Lanes	45 mph	No	No	No
High School Way	Minor Collector	2 Lanes	NP	South Side	No	No
Maple Street	Minor Collector	2 Lanes	NP	No	No	No
Williams Street	Minor Collector	2 Lanes	NP	Both Sides (some gaps)	No	No
Santosh Street	Local Street	2 Lanes	NP	No	No	No

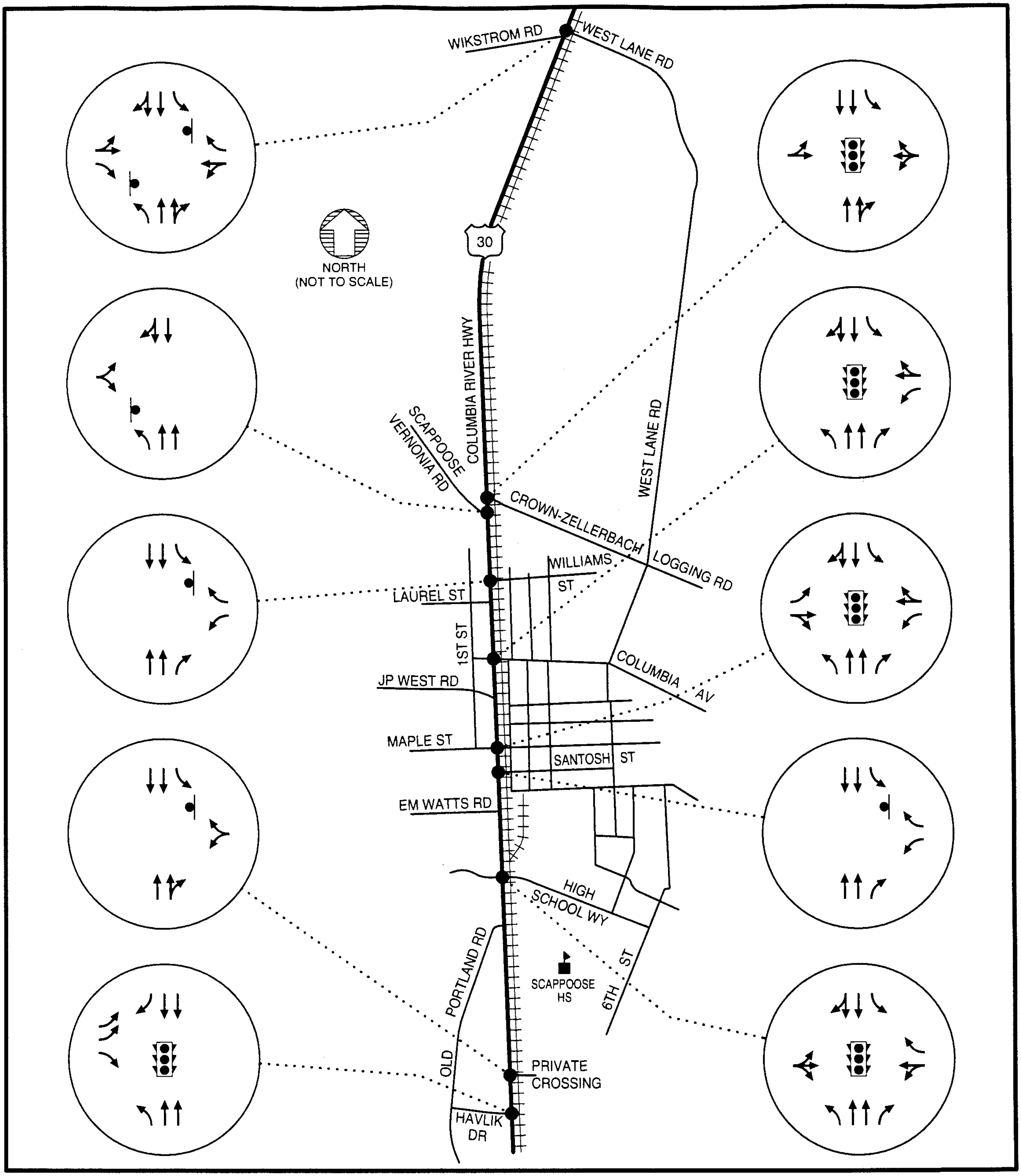
* Indicates cross section in the vicinity of Highway 30.
** The posted speed on Highway 30 is 35 mph between Maple Street and Scappoose-Vernonia Road.
*** This facility is currently a private roadway and not open to public travel.
NP = Not Posted

As shown in Figure 2-1 and Table 2-1, the City of Scappoose and ODOT classify Highway 30 as an Arterial and Statewide Highway, respectively. The 1999 Oregon Highway Plan (Reference 1) provides the following definition for Statewide Highways.

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

The segment of Highway 30, west of Portland, serves as an inter-urban connector for several small communities located along the Columbia River between Astoria and Portland. Highway 30 bisects the City of Scappoose from north to south, and as a result, is relied on to provide access to community businesses and residences within the city. Throughout the study area, Highway 30 maintains a five-lane cross-section with two travel lanes in each direction and a center, two-way left-turn lane (TWLTL). Northbound right-turn lanes are provided at several intersections along Highway 30 within the study area to reduce delay to through traffic and provide storage for right-turn vehicles when trains are blocking the respective crossings.

Key intersections and cross streets along the length of the Highway 30 corridor include Havlik Drive, the Fountains Galore & More/Time & Time Again (Candle Factory) site-access, High School Way, Santosh Street, Maple Street, Columbia Avenue, Williams Street, Scappoose-Vernonia Road, Crown-Zellerbach Logging Road, and West Lane Road. Signalized intersections currently exist at Havlik Drive, High School Way, Maple Street, Columbia Avenue, and Scappoose-Vernonia Road. The remainder of the intersections and access points along Highway 30 are currently stop-controlled on the minor street approaches. Figure 2-2 illustrates the existing lane configurations and traffic control devices at the key intersections along the Highway 30 corridor that were chosen for inclusion in this study.



LEGEND

- STOP SIGN
- TRAFFIC SIGNAL

EXISTING LANE CONFIGURATIONS AND TRAFFIC CONTROL DEVICES

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FIGURE 2-2

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Pedestrian Facilities

Sidewalks currently exist along most of Highway 30 within the study corridor. However, the existing pedestrian environment along the side streets within the corridor suffers from non-standardized treatment. For example, along some streets portions of the sidewalk are missing altogether or only provided on one side of the street. In other areas, the sidewalk is of substandard construction (e.g., a gravel path) and is often obstructed with utility poles or trees.

While field observations revealed that pedestrian activity along the roadways in the study area is moderately low, the City's 1997 TSP (Reference 2) recommends sidewalks on facilities with a classification of Minor Collector or higher.

Bicycle Facilities

Field observations within the site vicinity revealed low levels of bicycle activity along the study roadways with little supporting infrastructure provided. Bike lanes are provided in both directions along Highway 30 within the study corridor.

EXISTING TRAFFIC OPERATIONS

This section of the report provides an overview of the operational character of the roadway component of the corridor. Information is provided documenting existing traffic volumes, intersection operations, and performance measures.

Existing Traffic Volumes

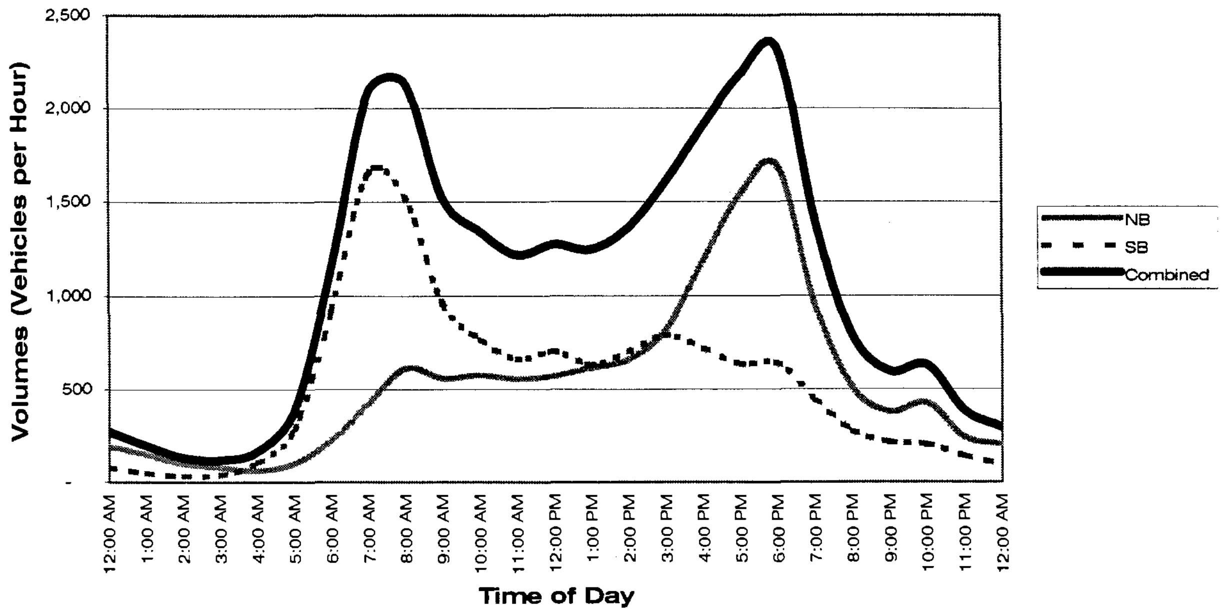
To develop a better understanding of the existing roadway system operations, weekday morning and evening peak hour traffic counts were collected along the study corridor for use in this evaluation.

Existing Daily Traffic Volumes

A 24-hour tube count was completed in November 2002 for Highway 30 just south of Havlik Drive. The 24-hour bi-directional volume profile for the corridor is shown in Figure 2-3.

As shown in Figure 2-3, the Highway 30 weekday peak hours of traffic demand occurred between 7:00 and 8:00 a.m. and 5:00 and 6:00 p.m. A heavy southbound through movement to the Portland metropolitan area is evident in the morning, with a strong reverse commute pattern evident in the evening.

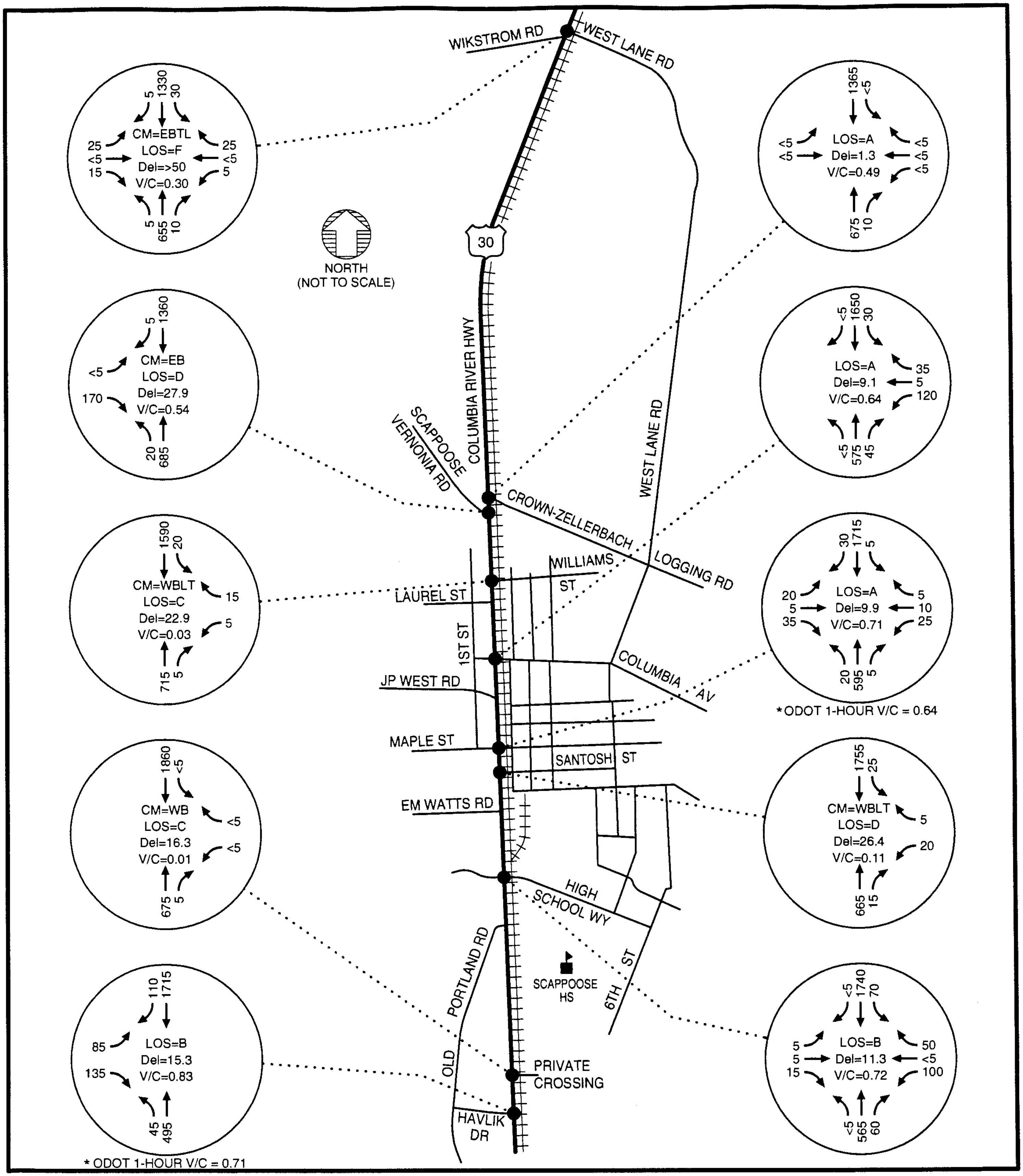
Figure 2-3
24-Hour Volume Profile on US Highway 30



Existing Weekday AM and PM Peak Hour Traffic Volumes

For this report, the average weekday a.m. and p.m. peak hour periods were used to evaluate existing traffic operations along the study corridor. Manual turning movement counts were obtained for the nine study intersections on a mid-week day in April 2002. Based on the peak periods identified in Figure 2-3, these counts were conducted during the weekday morning (7:00 a.m. – 9:00 a.m.) and evening (4:00 p.m. – 6:00 p.m.) peak hours. To ensure the analysis represents a reasonable worst-case scenario, the April counts were increased by a 26-percent seasonal adjustment factor to reflect peak summertime conditions. The seasonal adjustment is based on data collected at ODOT's Permanent Recorder Station #05-006 (located on Highway 30, approximately 5.2 miles west of Rainier, Oregon).

The turning movement counts from the weekday a.m. and p.m. peak hours were summarized and rounded to the nearest five vehicles per hour as shown in Figures 2-4 and 2-5. Largely due to the influence of Highway 30 traffic, the weekday morning peak hour occurs between 7:00 and 8:00 a.m., while the evening peak hour occurs between 5:00 and 6:00 p.m.



NOTE: LEVEL OF SERVICE AND V/C REFLECT PEAK 15-MINUTE OPERATIONS UNLESS OTHERWISE NOTED

LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/ CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE DELAY (SIGNALIZED)/ CRITICAL MOVEMENT DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

EXISTING TRAFFIC CONDITIONS
WEEKDAY AM PEAK HOUR

Scappoose Rail Crossing Corridor Study
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FIGURE 2-4

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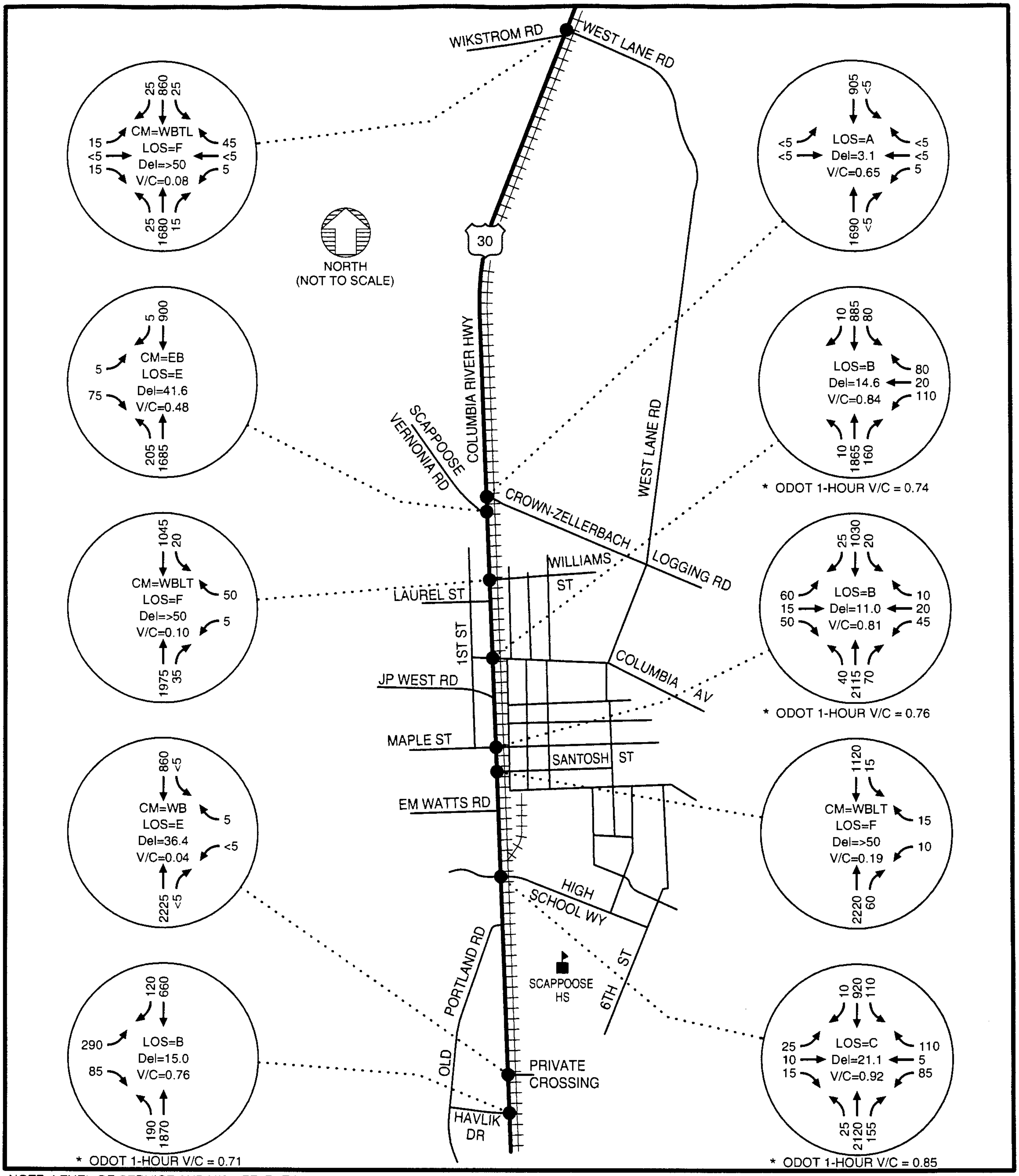

NOTE: LEVEL OF SERVICE AND V/C REFLECT PEAK 15-MINUTE OPERATIONS UNLESS OTHERWISE NOTED

LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
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Del = INTERSECTION AVERAGE DELAY (SIGNALIZED)/ CRITICAL MOVEMENT DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

EXISTING TRAFFIC CONDITIONS
WEEKDAY PM PEAK HOUR

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FIGURE 2-5

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Existing Weekday AM and PM Peak Hour Operations

All level-of-service analyses described in this report were performed in accordance with the procedures stated in the 2000 Highway Capacity Manual (Reference 3). To ensure that this analysis was based on a reasonable worst-case scenario, the peak 15-minute flow rate during the weekday a.m. and p.m. peak hours was used in the evaluation of all intersection levels of service. For this reason, the analyses reflect conditions that are only likely to occur for 15 minutes out of each average weekday peak hour. Traffic conditions during all other weekday hours will likely operate under better conditions than those described in this report.

Signalized Intersections

Of the ten study intersections, the following five intersections are currently signalized:

- Highway 30/Havlik Drive,
- Highway 30/High School Way,
- Highway 30/Maple Street,
- Highway 30/Columbia Avenue, and
- Highway 30/Crown-Zellerbach Logging Road.

Level of service analyses for signalized intersections in this report are based on the average control delay per vehicle entering the intersection. The City of Scappoose operating standards require a level of service "E" or better be maintained for all intersections during the peak hour.

The 1999 Oregon Highway Plan evaluates intersections based on the volume-to-capacity (v/c) ratio for peak hour operations. ODOT standards for intersections along the Highway 30 study corridor require that a 1-hour v/c ratio be less than 0.75 or 0.70, depending on the location. This variation in acceptable standards is reflected in the change in speed limits through the city. Higher speeds correlate with more stringent standards because it can be more difficult to access a higher speed facility than a lower speed facility. Table 2-2 is a summary of the ODOT v/c ratio standard for each signalized study intersection.

Table 2-2
Signalized Intersection V/C Ratio Standards

Intersection	1-Hour ODOT V/C Standard
Highway 30/Havlik Drive	0.75
Highway 30/High School Way	0.75
Highway 30/Maple Street	0.75
Highway 30/Columnbia Avenue	0.70
Highway 30/Crown-Zellerbach Logging Road	0.70

Using the weekday a.m. and p.m. peak hour traffic volumes, v/c ratios and levels of service were calculated for the five signalized study intersections as shown in Figures 2-4 and 2-5. As indicated in the two figures, all of the signalized study intersections currently operate at acceptable levels of service during both the weekday a.m. and p.m. peak hours.

All the signalized study intersections operate within ODOT's v/c ratio during the weekday a.m. peak hour. During the p.m. peak hour, the v/c ratios for the Highway 30/High School Way, Highway 30/Maple Street, and Highway 30/Columbia Avenue intersections exceed ODOT's 1-hour v/c ratio standards.

Unsignalized Intersections

The five following study intersections currently operate with unsignalized two-way stop control:

- Highway 30/Candle Factory Site-Access,
- Highway 30/Santosh Street,
- Highway 30/Williams Street,
- Highway 30/Scappoose-Vernonia Road, and
- Highway 30/West Lane Road.

Level-of-service analyses for unsignalized intersections in this report are based on the intersection's capacity to accommodate the worst or critical movement. The City of Scappoose operating standards require that a level of service "E" or better be maintained for all unsignalized intersections.

As in the case of signalized intersections, the 1999 Oregon Highway Plan evaluates intersection performance based on the critical movement v/c ratio for peak hour operations. Table 2-3 provides a summary of the ODOT v/c ratio standard for the critical movement of each unsignalized study intersection.

Table 2-3
Unsignalized Intersection V/C Ratio Standards

Intersection	1-Hour ODOT V/C Standard
Highway 30/Candle Factory Site-Access	0.85
Highway 30/Santosh Street	0.85
Highway 30/Williams Street	0.80
Highway 30/Scappoose-Vernonia Road	0.80
Highway 30/West Lane Road	0.80

Figures 2-4 and 2-5 also summarize the level of service and v/c ratio results for the unsignalized study intersections during the weekday a.m. and p.m. peak hours, respectively. During the weekday a.m. peak hour, the critical movement of the Highway 30/West Lane Road intersection operates at level of service "F". In addition, during the weekday p.m. peak hour, the critical movements of the Highway 30/Santosh Street, Highway 30/Williams Street, and Highway 30/West Lane Road intersections all operate at level of service "F".

At the unsignalized intersections operating at level of service "F", the minor approach critical movement was found to operate with relatively long delays. The poor level of ser-vice corresponds to the minor approach egress movement and reflects only the minor street vehicle delay. The major street (i.e., Highway 30) turning and through movements at these intersections operate at level of service "D" or better during the existing weekday p.m. peak hour. As indicated by the relatively low v/c ratios for the critical movements, there is still capacity at these locations to accommodate the existing traffic demand. A signal warrant analysis investigation of these three intersections revealed that, under existing peak hour traffic conditions, no traffic signal warrants are met.

The critical movements of all the unsignalized intersections operate with acceptable v/c ratios during both the weekday a.m. and p.m. peak hours.

Existing Traffic Safety Conditions

A safety evaluation for the study corridor was also conducted. The crash history of the study intersections was examined to identify any existing safety issues and concerns. ODOT provided historical data summarizing all reported accidents along the corridor occurring between January 1, 1998 and December 31, 2000. The data were presented in terms of both crash severity and type. It should be noted that reported crashes typically underestimate the total number of crashes that have occurred because minor incidents are not always reported to the local agencies. These data were further analyzed to isolate individual roadway segments and intersections within the study area.

Table 2-4 is a summary of the crash history along Highway 30 between Havlik Drive and West Lane Road with respect to crash severity and type. As shown in Table 2-4, during the 36-month review period, 46 crashes were reported along Highway 30 at the study intersections. Thirty-five of these crashes involved personal injury, but no fatalities were reported. The rear-end collision was the most common type of crash reported.

Table 2-4
Study Intersection Crash Histories

Intersection	Number of Crashes	Collision Type			Severity	
		Lane Change/ Turning	Rear End	Angle	Property Damage Only	Personal Injury/ Fatality
Highway 30/Havlik Drive	0	0	0	0	0	0
Highway 30/Candle Factory Access	0	0	0	0	0	0
Highway 30/High School Way	11	3	7	1	4	7
Highway 30/Santosh Street	4	2	2	0	2	2
Highway 30/Maple Street	4	2	2	0	3	1
Highway 30/Columbia Avenue	14	2	11	1	7	7
Highway 30/Williams Street	0	0	0	0	0	0
Highway 30/Scappoose-Vernonia Road	10	2	8	0	6	4
Highway 30/West Lane Road	3	1	0	2	0	3
Total	46	12	30	4	22	24

As shown in Table 2-5, the crash rates for all of the study intersections were below the threshold of 1.00 crashes per million entering vehicles. An analysis of the crashes within the study corridor did not identify any particular patterns that could be mitigated and maintain a reasonable cost-to-benefit ratio.

The crash histories were also used to evaluate arterial crash rates for the roadway segments between the study intersections. Crash rates for arterial segments are generally expressed in crashes per million vehicle miles (MVM). The crash rate for roadways is typically compared to the statewide average found in ODOT's State Highway Accident Rate Tables (Reference

4) to determine if a particular roadway's crash rate is lower or higher than the statewide average.

The crash histories were used to calculate individual crash rates at each of the study intersections along Highway 30. These crash rates at the intersection are expressed in terms of the number of crashes per million entering vehicles and are summarized in Table 2-5. In general, a crash rate above 1.00 typically identifies locations where further evaluation regarding safety should be conducted.

Table 2-5
Study Intersection Crash Rates

Intersection	Number of Crashes	Crashes per Year	Peak Hour TEV	MEV/ Year	Crashes/ MEV	>1 Crash/ MEV
Highway 30/Havlik Drive	0	0.0	3,215	11.7	0.00	No
Highway 30/Candle Factory Site-Access	0	0.0	3,095	11.3	0.00	No
Highway 30/High School Way	11	3.7	3,590	13.1	0.28	No
Highway 30/Santosh Street	4	1.3	3,440	12.6	0.11	No
Highway 30/Maple Street	4	1.3	3,500	12.8	0.10	No
Highway 30/Columbia Avenue	14	4.7	3,220	11.8	0.40	No
Highway 30/Williams Street	0	0.0	3,130	11.4	0.00	No
Highway 30/Scappoose-Vernonia Road	10	3.3	2,885	10.5	0.32	No
Highway 30/West Lane Road	3	1.0	2,720	9.9	0.10	No

TEV = Total Entering Vehicles *MEV = Million Entering Vehicles*

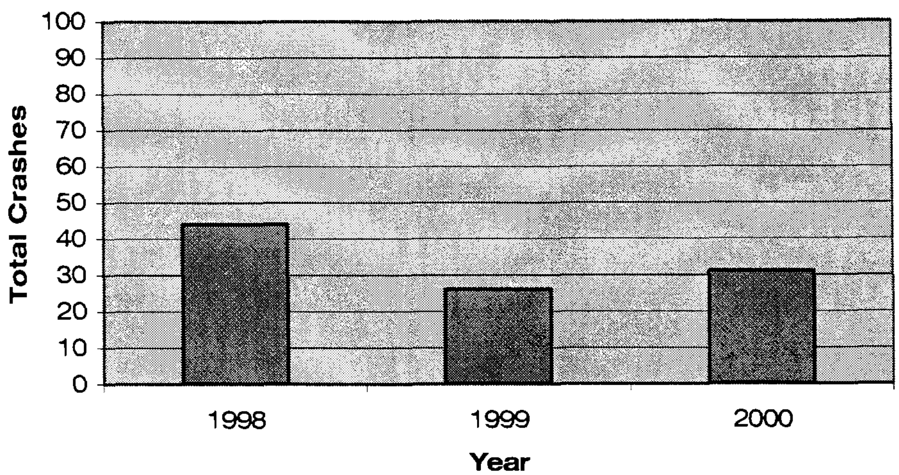
Highway 30 was compared to the average rate cited for Urban State Highway System Non-Freeway in the ODOT 2000 rate table of 2.90 crashes per MVM. Over the 36-month period of time between January 1, 1998 and December 31, 2000, a total of 53 non-intersection crashes were reported along Highway 30 between Havlik Drive and Scappoose-Vernonia Road. Table 2-6 shows the arterial crash rate for the segment of Highway 30 that was evaluated. As shown in Table 2-6, the crash rate on this study segment was found to be less than the statewide average rate.

Table 2-6
Study Arterial Crash Rate

Highway 30 Segment	Length of Segment (miles)	Number of Crashes	ADT	Crashes/ MVM	Statewide Average
Havlik Drive (M.P. 19.39) to West Lane Road (M.P. 22.49)	3.10	53	24,950	0.63	2.90

In addition to the previously described analyses, a historical trend analysis for safety over the 3 –1/2 year period was also performed. Reported crashes per year along the study corridor are shown in Figure 2-6.

Figure 2-6
Annual Corridor Crash Trend



As shown in Figure 2-6, the study segment of Highway 30 has experienced on average approximately 33 crashes per year, with no significant trend increase or decrease. Given the specific intersection and arterial crash rates and historical crash trends identified, this corridor is currently operating at better than the state average for this type of facility. However, safety should remain a primary concern throughout this study process and all recommendations and alternatives should focus on improving traffic, pedestrian, and bicyclist safety wherever possible.

Known Access and Circulation Issues

Based on field observation and feedback received from the PAC and TAC members, several existing access and circulation issues were identified and are presented below.

South Circulation: High School Way/Havlik Drive

High School Way currently serves as the primary access facility for all developments located east of Highway 30 and south of Elm Street. Community members have expressed concern about the high volume of traffic on High School Way and the potential safety implications it may have on pedestrians and bicyclists near the high school. As lands within this area continue to develop, a greater demand will be placed on High School Way to accommodate additional traffic. This increasing traffic demand will continue to concentrate traffic in front of the high school.

Of particular concern are the pedestrian crossings and the potential pedestrian-vehicle interactions arising from the proximity of the sports fields and High School Way. The parking facilities serving the sports fields are located on the opposite side of High School Way, and users must cross the roadway between them and the field. Residents expressed continued interest in finding alternative roadway connections to reduce travel demand on High School Way, particularly through the proposed Havlik Drive extension.

Post Office Access

Multiple comments were received about the difficulty of accessing and leaving the city's post office during both weekday peak hour periods. The post office is located on the west side of Highway 30, just north of Columbia Avenue. The poor access to the site is a function of the limited number of available gaps on Highway 30 during the peak traffic periods and the lack of convenient signalized access to the highway. The closest signalized intersection to the north is at Scappoose-Vernonia Road, which requires motorists to drive a circuitous route. The closest signalized intersection to the south is at Columbia Avenue; however, Columbia Avenue is restricted to one-way, westbound operations west of Highway 30. The closest, full-access, signalized intersection to the south is at Maple Street, which also requires motorists to drive a circuitous route.

Columbia Avenue Widening/Conversion to Two-Way Traffic

Columbia Avenue has been identified in the City's TSP as a Major Collector; however, it currently provides only two-way traffic east of Highway 30. Widening this facility on the west side of Highway 30 to accommodate two-way traffic may improve east-west connectivity and enhance local circulation patterns (e.g., access to the post office). Drawbacks of widening Columbia Avenue to accommodate two-way operations on the west side of Highway 30 include the potential loss of existing on-street parking and right-of-way acquisition that could affect local businesses.

East-West Connectivity and Local Traffic on Highway 30

Traffic within the city limits relies on Highway 30 to facilitate east-west connectivity. Consequently, the available capacity to accommodate inter-urban travel on the highway is reduced. Developing streets that provide strategic east-west connectivity across Highway 30 will improve local traffic circulation and improve operations at the signalized intersections within the corridor. In addition, there are no continuous north/south collector streets within the city limits that parallel Highway 30. Developing a frontage street system or equivalent collector facilities would also serve in reducing local travel demand on Highway 30.

Location of Fire Station/Emergency Response Issues

The City of Scappoose fire station is located on the west side of Highway 30 between Williams Street and Scappoose-Vernonia Road and can gain access to Highway 30 via signalized pre-emption. However, with the current lack of adequate east-west connectivity, the ability of emergency services to respond to an emergency situation is impaired (particularly when trains are passing through the city). Providing alternative access routes to all areas within the city will help decrease emergency service response times.

Connectivity Near Steinfeld's Factory

The former Steinfeld's Factory is a large, currently unoccupied development located on the east side of Highway 30 between High School Way and Elm Street. The site currently impedes the continuation of 3rd Street south between Elm Street and High School Way as well as the extension of E.M. Watts Road to the east of Highway 30. Redevelopment of this site to provide roadway extensions and connections has the potential to significantly enhance local circulation patterns by completing the grid system between Elm Street and High School Way.

Railroad Pre-Emption

Active grade crossing devices (i.e., signalized gated crossing) are maintained at the High School Way, Maple Street, and Columbia Avenue rail crossings. Currently, when a train approaches these crossings, detectors on the tracks instruct the signal controller to initiate the pre-emption routine that stops all traffic on Highway 30 and provides a flashing yellow indication to motorists on the minor street approach. The purpose of the flashing yellow indication is to allow queued motorists to clear the zone between the tracks and the highway. A new method for pre-emption has been adopted by ODOT in which motorists on the minor street approach are given a green indication during the track-clearance interval. As improvements are made at the rail crossing locations, all existing and proposed active control devices should be upgraded to allow the current pre-emption methodology to be implemented.

EXISTING RAIL OPERATIONS AND FACILITIES

The following sections provide a history of the local rail corridor and describe the existing operations within the corridor.

Summary of Rail Corridor History

As Oregon became populated in the 1800's, the community supported building a railroad from Astoria to Portland because they believed that Astoria was an ideal location for a major port. Astoria's civic leaders attempted to compete with the port in Portland to become the Northwest major seaport. The community felt they had an advantage over Portland because large sea vessels would not have to navigate through the lengthy channel system. However, Astoria did not have a railroad connection to Portland.

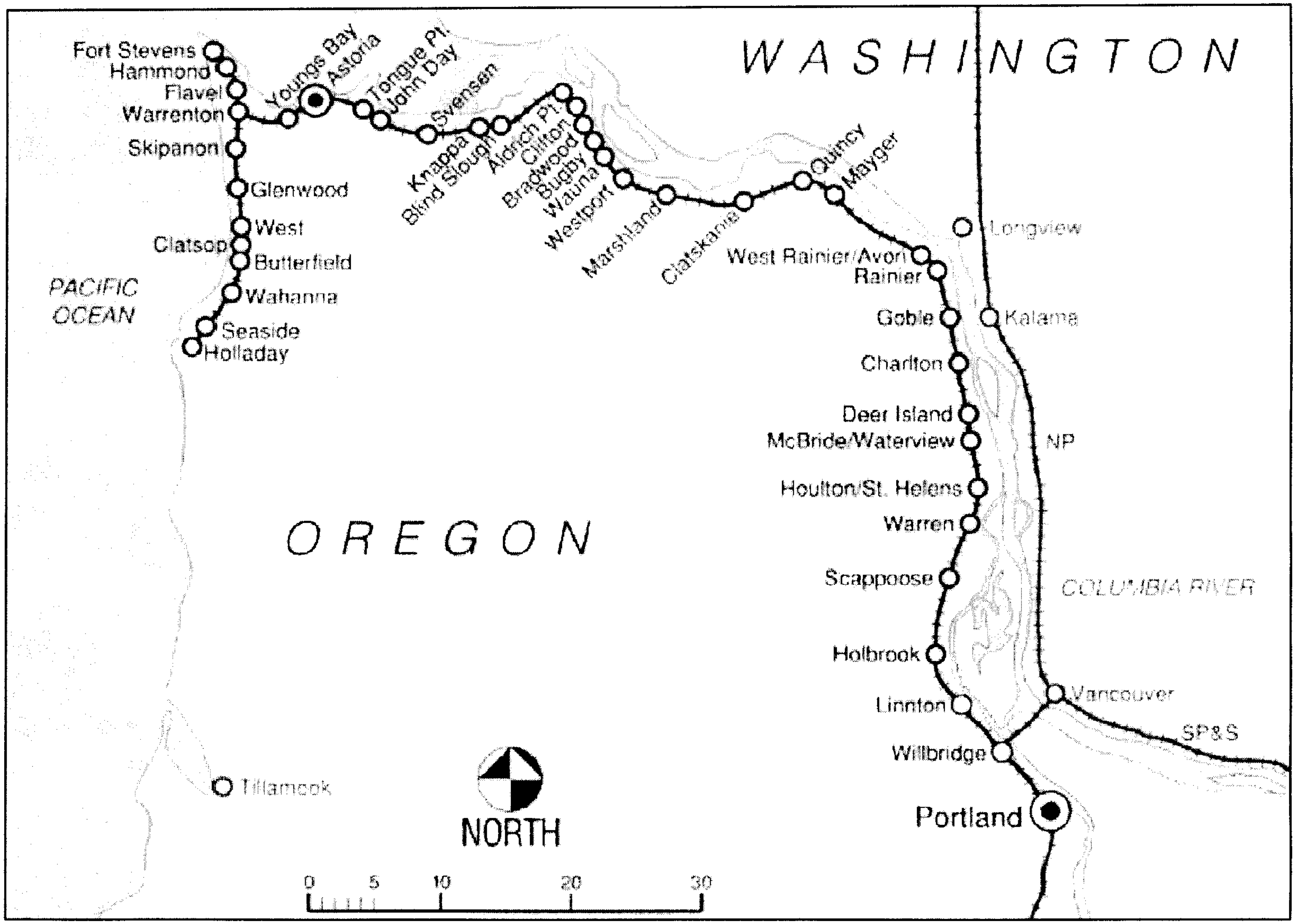
The closest connection, in Goble, had been constructed by the Spokane Portland & Seattle (SP&S) Railway as part of the Puget Sound grant. The community hoped that the SP&S would expand their line into Astoria, but nothing came of it. As a result, the community started a local railroad called the Astoria & South Coast Rail and began construction to Portland in 1888. After several problems with financing, the connection from Portland to Goble was completed in 1906. As a result of continuing financial issues, the portion of railroad from Goble to Astoria was sold to Northern Pacific, who in turn sold it to the SP&S railroad. Figure 2-7 is a map of the SP&S Railroad trackage.

The SP&S later assigned the track and right-of-way to the Burlington Northern Railroad (BN), which continued to service this area. In September 1995, the BN merged with the Santa Fe Railroad creating the Burlington Northern Santa Fe Railroad (BNSF). The PNWR then purchased the trackage and freight rights between Portland and Astoria from the BNSF in the fall of 1997. That same year, the BNSF donated the property within the right-of-way to ODOT.

The ODOT Rail Division is currently the administering body responsible for safety and operations along this section of trackage. An exclusive easement was granted to PNWR allowing PNWR to maintain and control the property within the right-of-way. PWRR has designated the rail corridor through Scappoose as being part of its "A"-Line.

EXISTING RAIL OPERATIONS

The PNWR currently operates four trains on the "A"-Line from Portland to Astoria - the log train, the rock train, and two local hauler trains. These



SP&S RAILROAD TRACKAGE MAP

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FIGURE 2-7

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trains generally operate five days a week; occasionally PNWR operates trains on Saturdays.

The log train originates and picks up its load for the day in Rainier and heads south on the "A"-Line through Scappoose to United Junction. The train then proceeds over Cornelius Pass to the Tillamook Branch. Once on the Tillamook Branch, the log train collects additional wood chip cars at Banks Lumber Company. It then heads to Beburg siding, which is the PNWR main switching yard for the Portland Area, where it sets out and picks up cars, then returns to the City of Rainier.

The rock train originates north of Salem at the Morse Brothers Reed Pit quarry. From there it departs with its loaded cars for Hillsboro via the Tillamook Branch, crossing over Cornelius Pass to the "A"-Line, and on to its delivery location at Deer Island in St. Helens. It then makes a return trip back to Reed Pit.

Local Hauler #1 originates in St. Helens, Oregon and provides switching services for local industries up and down the "A"-Line corridor as it heads towards Portland. This route is operated 3 days a week. Two other days during the week, the train originates in St. Helens and heads towards Rainier to provide switching services for local industries on the northern portion of the "A"-Line. Local Hauler #2 originates in Portland and provides switching services along the line between St. Helens and Portland when Local Hauler #1 is switching the industry north of St. Helens.

Types of Grade Crossings

Grade crossings are also classified by the type of protection provided and are considered either active or passive. Active signal systems generally have an electronic train detection system with flashing lights that warn the motorist when a train is approaching or at the crossing. Although an active crossing system is relatively expensive to install and maintain, it provides a safer grade crossing as compared to a passive system. A passive system simply denotes the location of the crossing (typically through signing or pavement markings) and depends on the motorist to detect and yield the right-of-way to the train. Depending on the available sight distance and train speeds, passive crossings can present a dangerous conflict situation, and require a high level of awareness on the part of the motorist.

EXISTING RAIL FACILITIES

Grade Crossing Control

Grade crossings have two types of classifications: private and public. A private grade crossing is an access or driveway to a landowner's property.

The landowner has a contract with the railroad implicating the landowner as the responsible party in case of a car/train collision. Public grade crossings are open to and used by the public and are typically city- or county-controlled streets that cross the railroad. Figure 2-8 identifies the locations of each crossing.

GRADE CROSSING ENGINEERING ASSESSMENT

Many elements affect the use and future viability of a given grade crossing. Each of these elements must be considered when evaluating the performance of, and need for, a crossing. In performing the engineering assessment, the Consultant Team considered practical issues related to how each crossing affects the current and future needs of the City of Scappoose, ODOT's Highway and Rail Division, and PNWR.

Evaluation Criteria

Each rail crossing was evaluated based on qualitative benefit, compliance with design standards, and compliance with other applicable standards. The results of the existing conditions engineering assessment are presented in Table 2-7. The purpose of this assessment is to identify the existing characteristics of each crossing in order to develop alternative corridor plans and select a preferred plan.

ODOT Rail Division's current Oregon Administrative Rules (OAR) are consistent with the American Association of State Highway and Transportation Officials (AASHTO) 1994 engineering standards which state that the surface of the roadway shall be in the same plane as the top of rails for a distance of at least 2 feet outside the rails, and not more than 3 inches higher nor 6 inches lower than the top of the nearest rail at a point thirty feet from the rail, measured at right angles thereto. This standard is in place to prevent drivers of low-clearance vehicles from becoming caught on the tracks and causing damage to the track or vehicle. Figure 2-9 provides an illustration of the vertical profiles for both Highway 30 and the railroad throughout the study area. Figure 2-10 identifies the geometric elements associated with the 1994 AASHTO rail crossing criteria (Reference 5).

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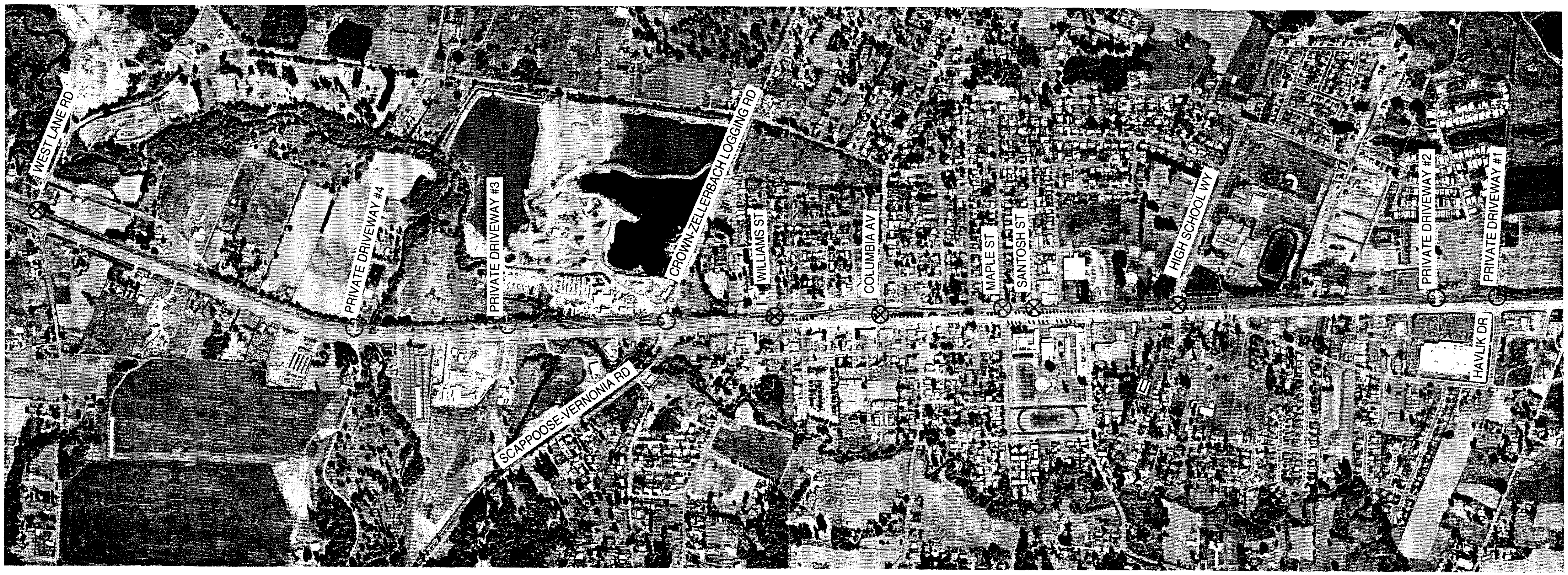
Table 2-7 Grade Crossing Engineering Assessment

#	Questions to be answered	Private Drive #1	Private Drive #2	High School Way	Santosh Street	Maple Street	Columbia Avenue	Williams street	Zellerbach Logging Road	Private Drive #3	Private Drive #4	West Lane Road
QUALITATIVE BENEFITS OF CROSSING												
A-1	Does the crossing provide Private ○ or Public ● access?	○	○	●	●	●	●	●	○	○	○	●
A-2	Are the grade crossing traffic control devices Passive ○ or Active ●?	○	○	●	○	●	●	○	○	○	○	○
A-3	Does the roadway facilitate east-west circulation by providing a continuous route on both sides of Highway 30?	○	○	◒	◔	◕	◒	◔	○	○	○	◔
A-4	Does the roadway have signalized access to Highway 30?	○	○	●	○	●	●	○	●	○	○	○
A-5	Is there queue storage distance between Highway 30 and the grade crossing?	●	●	◒	◒	◒	◒	◒	◔	●	●	◒
A-6	Is the crossing over multiple tracks ○ or a single track ● ?	●	●	●	●	●	○	○	●	●	●	●
A-7	Is the crossing relatively uniform spaced with respect to adjacent crossings?	●	◔	◕	○	○	◕	◒	◕	●	●	●
A-8	Is the vehicular travel demand at the crossing relatively high?	○	○	●	◒	◕	●	◒	◔	○	○	◒
A-9	Is there separate left-turn and right-turn storage on Highway 30 to queue existing vehicles while trains pass?	◕	◕	◒	◒	◒	◒	◒	◒	◕	◕	◒
A-10	Does the roadway connection provide alternative access to High School Way?	○	○	○	◕	◕	◒	◔	○	○	○	◔
A-11	Does the grade crossing facilitate emergency access?	◔	◒	◕	◔	◔	◕	◕	◒	◒	◒	◕
COMPLIANCE WITH DESIGN STANDARDS												
B-1	Does the grade crossing meet applicable AASHTO vertical curvature design standards? Yes ● **No** ○	N/A	N/A	○	○	○	○	●	○	N/A	N/A	●
B-2	Does the grade crossing meet applicable horizontal turning radius design standards?	○	○	○	○	○	○	○	○	○	○	◔
B-3	Has the crossing surface been modernized (e.g., is it concrete panels, timber, asphalt, other)?	○	◔	◕	◔	◕	◕	◔	◔	◕	◔	●
B-4	Is a clear line of sight available at the crossing to see approaching trains?	◕	●	●	◔	◒	●	◕	◔	●	◔	●
COMPLIANCE WITH OTHER APPLICABLE STANDARDS												
C-1	Is the roadway location consistent with the City of Scappoose Transportation System Plan?	●	○	●	●	●	●	●	●	○	○	●
C-2	Does the grade crossing/roadway meet ODOT Highway intersection spacing standard?	◔	◔	◔	○	◔	◔	◒	●	○	○	○
C-3	Are pedestrian facilities provided?	○	○	◒	●	●	●	◒	○	○	○	○

○ No/None ◔ ◒ ◕ ● Yes/All

NORTH
(SCALE: 1"=1,000')



LEGEND

◯ PRIVATE CROSSING

⊗ PUBLIC CROSSING

EXISTING RAIL CROSSING LOCATIONS

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FIGURE 2-8

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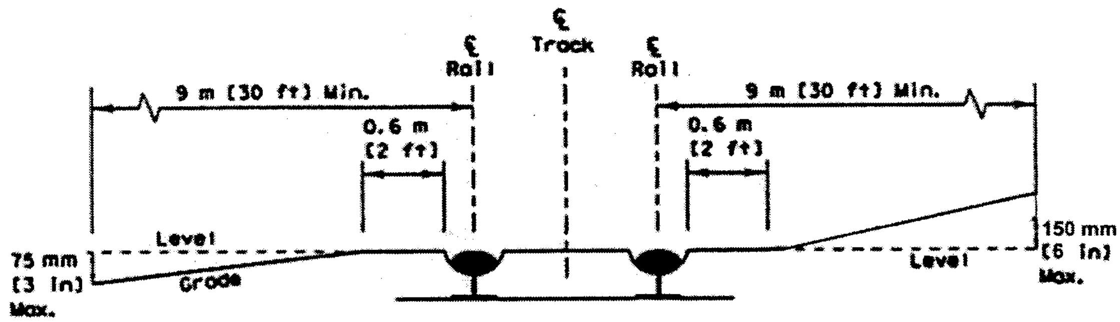
Figure 2-9
1994 AASHTO Rail Crossing Criteria



AASHTO has an updated 2001 version of the engineering standards, which states that the surface of the roadway shall be in the same plane as the top of rails for a distance of at least 2 feet outside the rails, and not more than 3 inches higher nor 3 inches lower than the top of the nearest rail at a point thirty feet from the rail, measured at right angles thereto. ODOT Rail has indicated that they are in the process of revising their OARs, but do not intend to change to the new AASHTO 2001 standards. ODOT Rail is not opposed to the new standard, but is in the process of evaluating the AASHTO 1994 standard for any inadequacies. If ODOT Rail finds sufficient documentation that suggests that the 1994 standard is inadequate they will more than likely change the OARs to conform to the new AASHTO standard.

The horizontal alignment of Highway 30 and the PNWR "A"-Line is roughly parallel within the study area. On average, the edge of pavement for the highway is approximately 55 feet from the centerline of the railroad throughout the corridor, which leaves little or no room for traffic queuing between Highway 30 and the grade crossing. All of the public crossings except West Lane Road have northbound right-turn lanes on Highway 30 that allow right-turning traffic to queue outside of the highway through lanes. This enables northbound through traffic to proceed in the event that a passing train occupies the crossing.

Rail weights are measured in pounds (#) per linear yard of rail (e.g., a 3-foot section of 136# rail would weigh 136 pounds). 136# rail is a heavier rail section that is typically used through a grade crossing. The 136# rail is standard because lighter rail sections will break down under the truck and car traffic's tires pounding the rail as they pass over the crossing.

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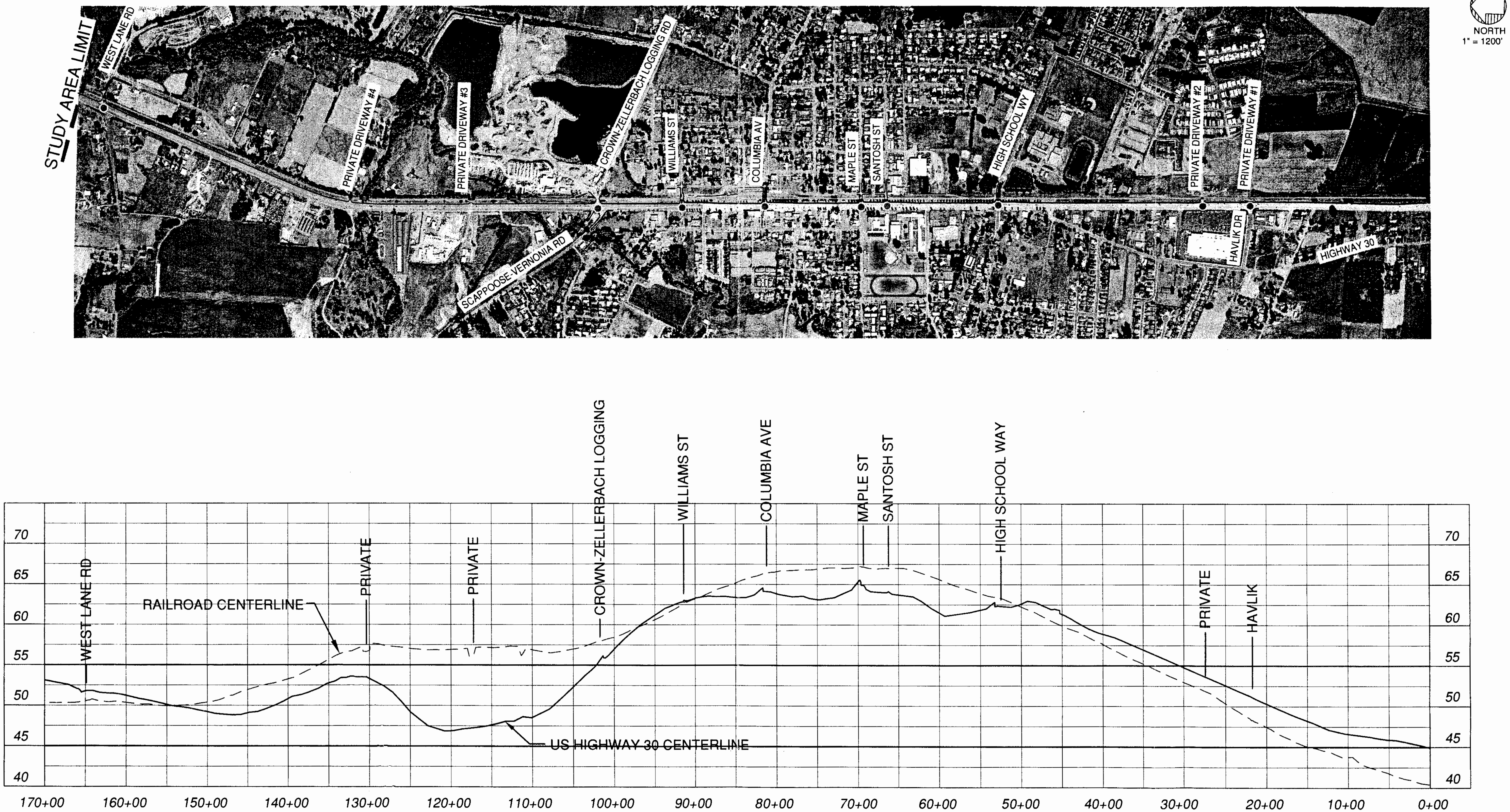

LEGEND

- ● STUDY INTERSECTION
- — — — — STUDY AREA LIMIT

RAIL CORRIDOR VERTICAL PROFILE

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FIGURE 2-9

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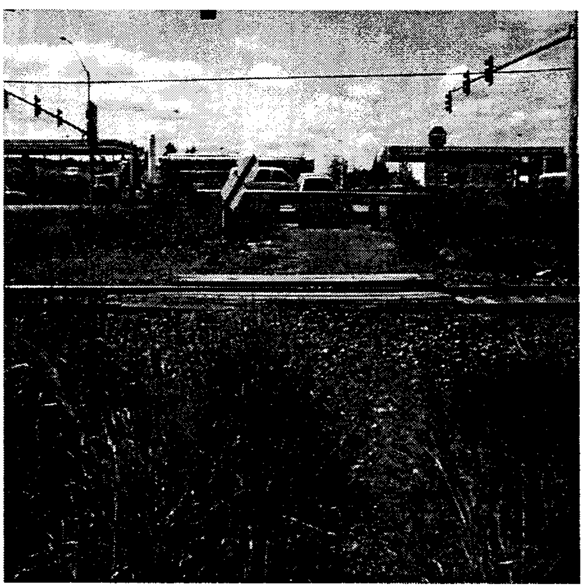
Existing Rail Crossing Conditions

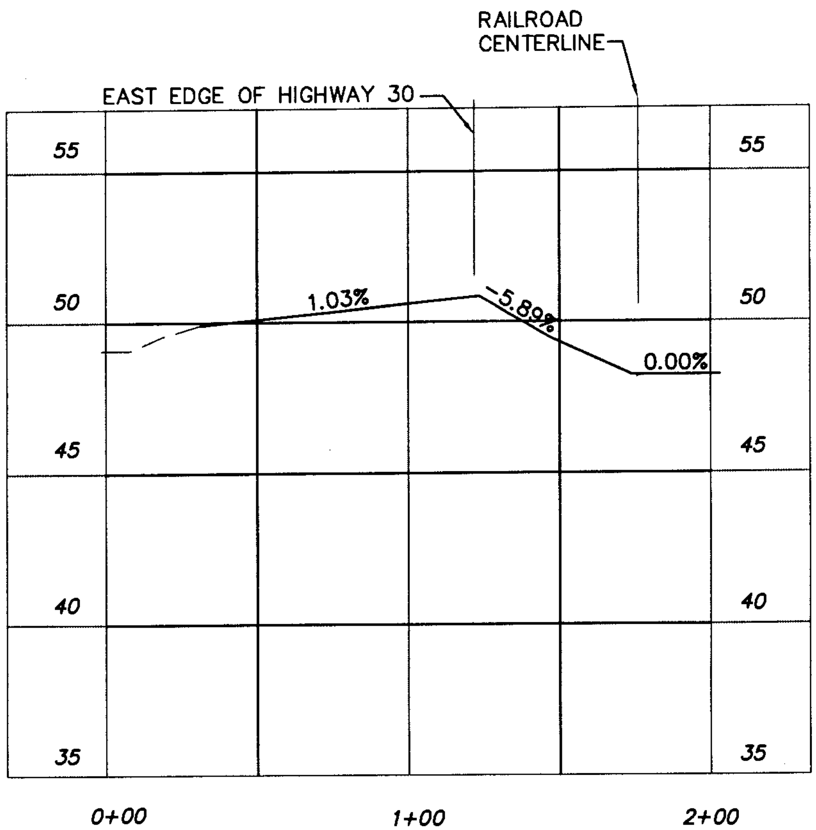
The following section provides a summary of each of the study grade crossings, including the type of crossing protection, crossing surface, and other relevant information. Corresponding plan and profile information is provided in Figures 2-11 through 2-18.

Private Crossing #1. (M.P. 126.8)

Beginning at the south end of the study boundary, the first crossing encountered is a private driveway directly east of Havlik Drive. The grade crossing is equipped with a passive warning device, namely a stop sign on each side of the tracks. The crossing is constructed with 90# rail through the crossing. The crossing surface consists of timber ties with asphalt and gravel approaches to the crossing (see Figure 2-11).



Private Crossing #1
(Facing West)



HAVLIK DRIVE PROFILE

HAVLIK DRIVE PLAN

HAVLIK DRIVE PLAN AND PROFILE

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FIGURE 2-11

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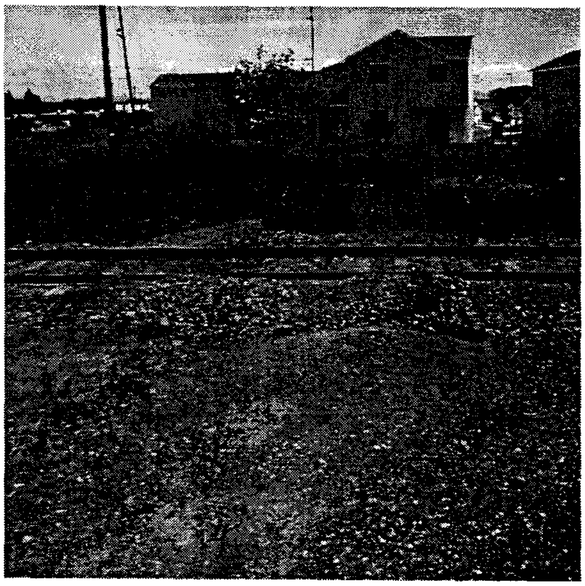
Private Crossing #2. (M.P. 126.7)

The next crossing encountered is a private driveway entering the Candle Factory. The grade crossing has a stop sign on each side of the track, making it a passive signal system. The crossing is constructed with 90# rail through the crossing. The crossing surface consists of timber ties with asphalt approaches to the crossing.

Private Crossing #2
(Facing East)

Private Crossing #3. (M.P. 126.4)

Approximately 0.25 mile north of the Candle Factory rail crossing there is an obsolete private grade crossing. Prior to the corridor study, the crossing was removed and taken out of service by PNWR.

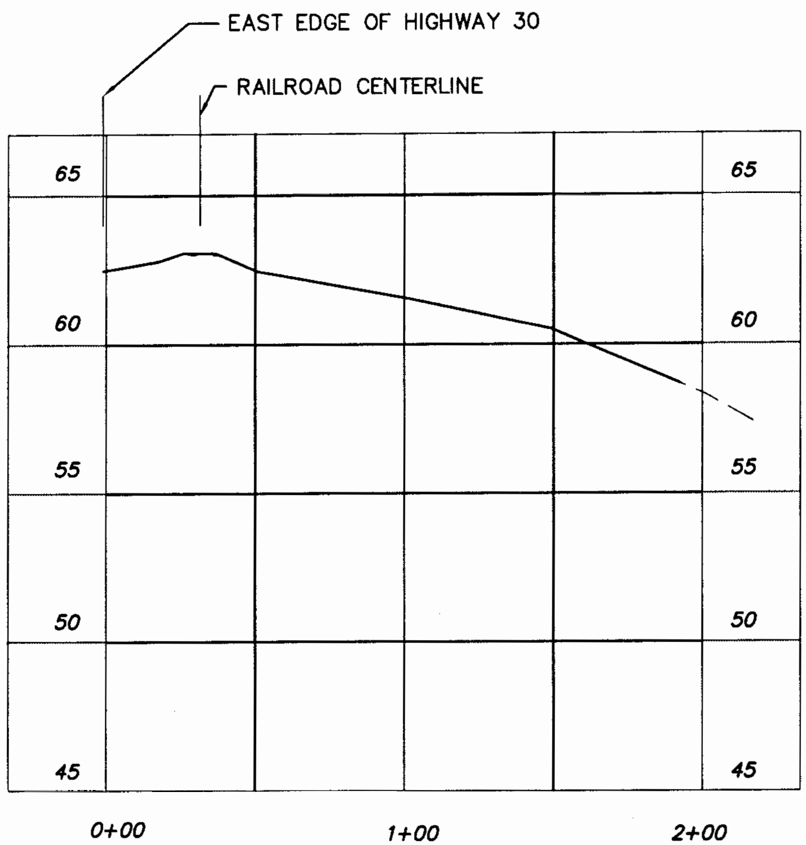


Private Crossing #3
(Facing East)

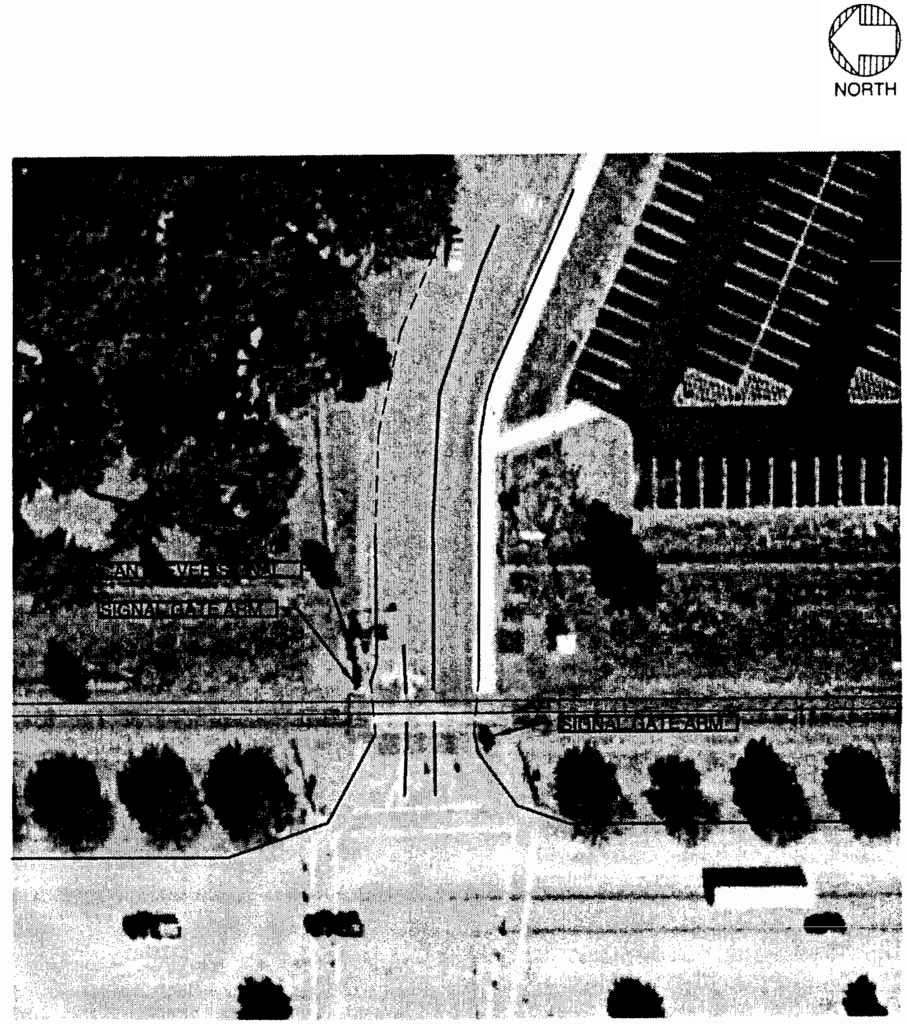
High School Way. (M.P. 126.3)

High School Way is the first public crossing from the south and it is equipped with an active signal system. The crossing signal warning system includes two signal gates (one on each side of the crossing) and a cantilevered flashing light signal located on the east side. The intersection of Highway 30 is also signalized to provide traffic signal pre-emption at the railroad crossing. The crossing is constructed with 115# rail through the crossing, but steps down to 90# rail on each side of the crossing surface. The crossing surface includes Omni concrete crossing panels for the roadway traffic and timber planks at the sidewalk crossings. The crossing does not meet the 1994 AASHTO standards for grade crossings (see Figure 2-12).

High School Way
(Facing North)



HIGH SCHOOL WAY PROFILE



HIGH SCHOOL WAY PLAN

HIGH SCHOOL WAY PLAN AND PROFILE

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FIGURE 2-12

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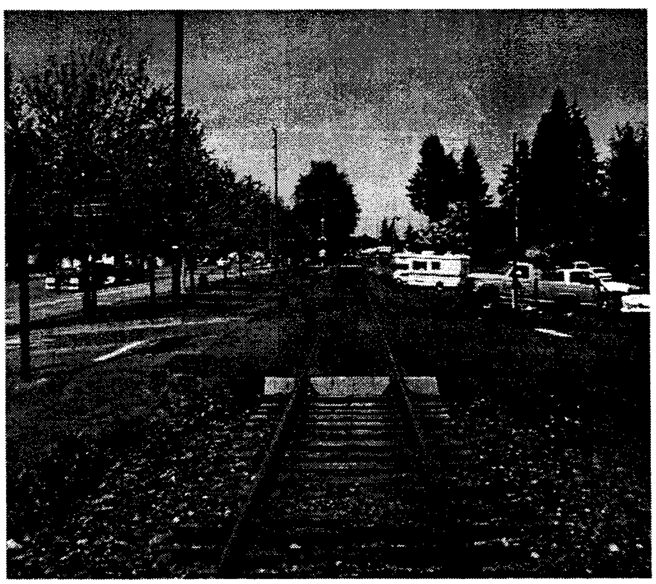
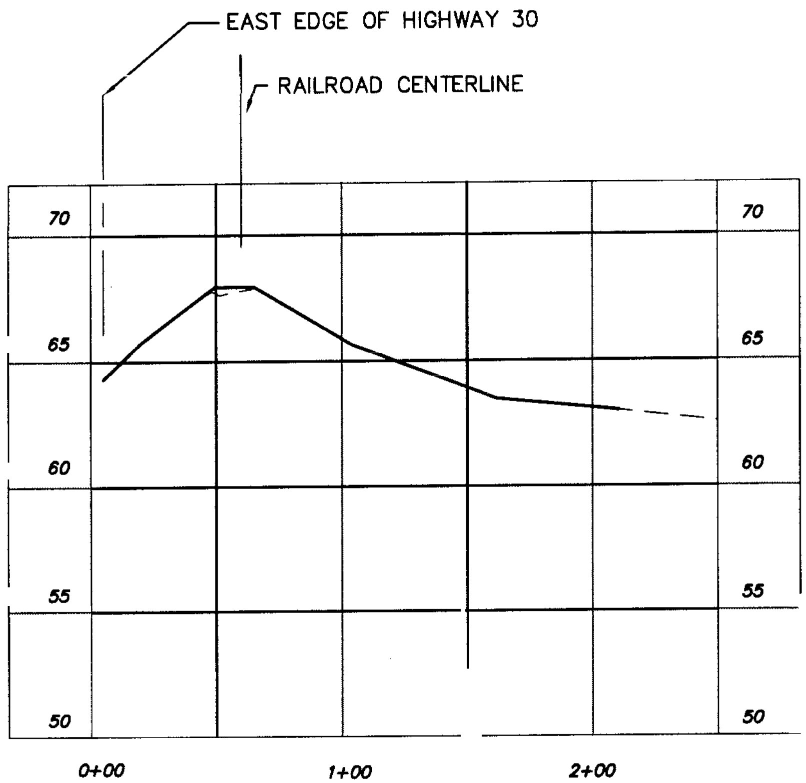
Santosh Street. (M.P. 126.0)

Santosh Street is an unsignalized public crossing. The crossing is protected by passive warning devices (stop signs), and has rubber crossing panels and timber planks at the sidewalks. The intersection with Highway 30, located south of Maple Street, is unsignalized. The rail through the crossing is similar to High School Way, with 115# in the crossing area, but quickly steps down to 90# rail outside the crossing. The crossing itself appears to be approximately four feet higher than the intersection with Highway 30. The crossing does not meet the 1994 AASHTO standards for grade crossings (see Figure 2-13).

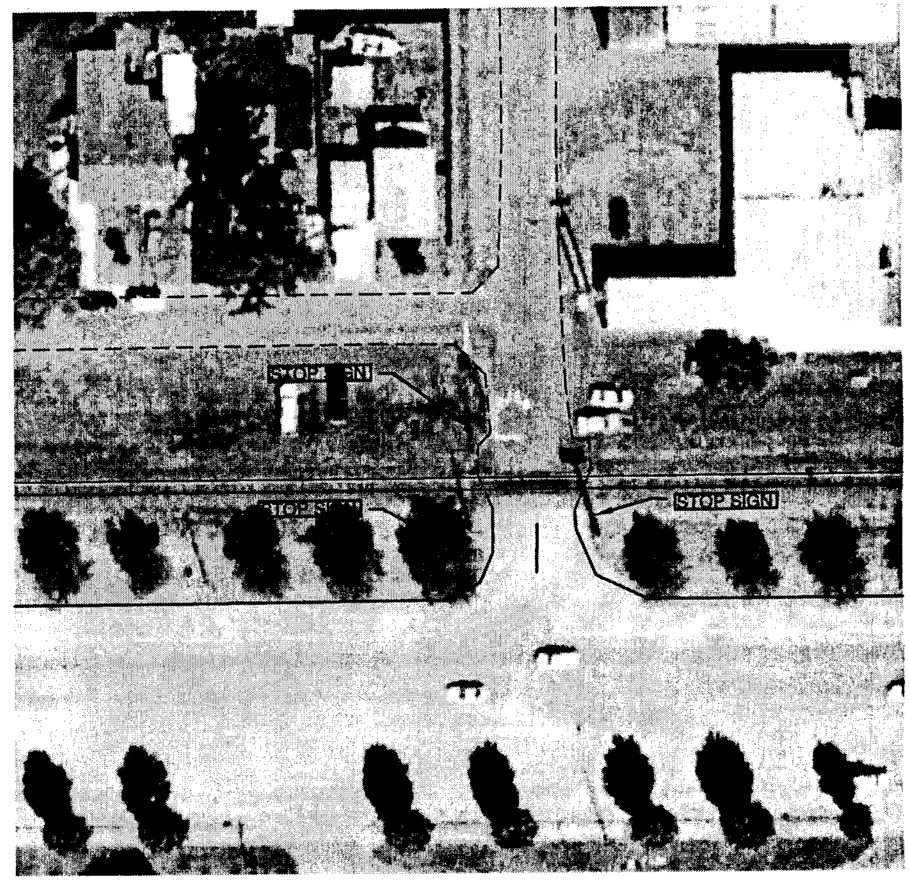


Santosh Street
(Facing North)



SANTOSH STREET PROFILE

NORTH



SANTOSH STREET PLAN

SANTOSH STREET PLAN AND PROFILE

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FIGURE 2-13

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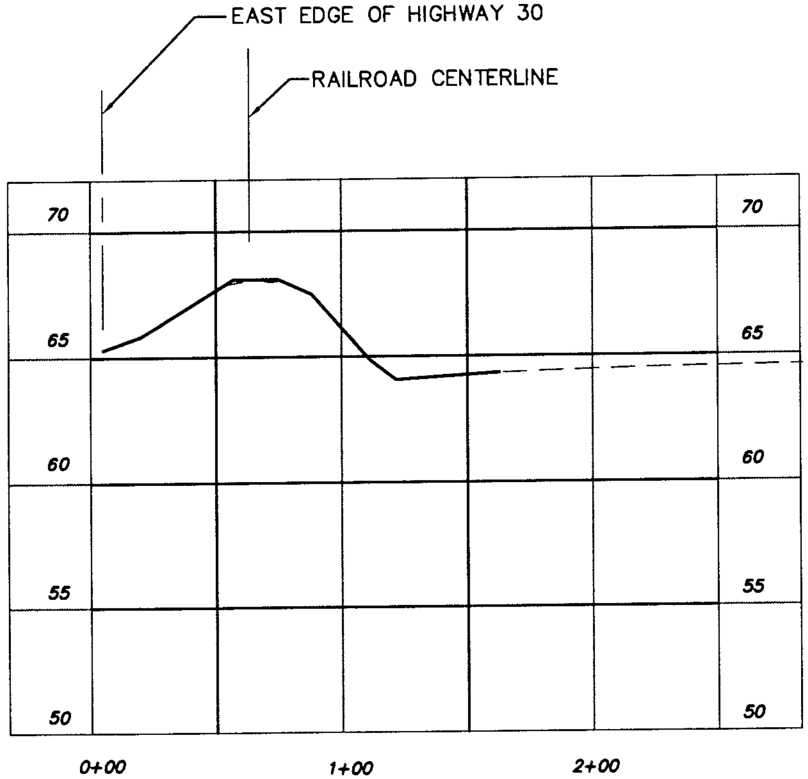
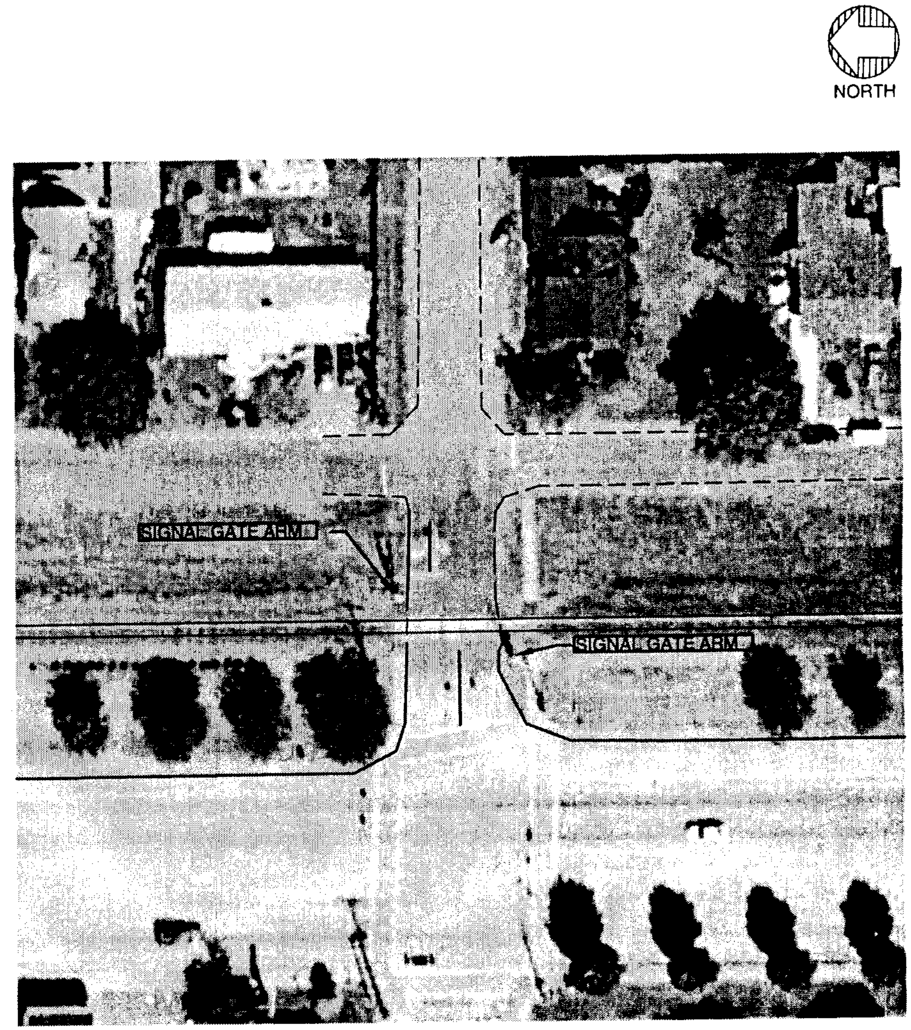
Maple Street. (M.P. 125.9)

Maple Street is a public crossing with an active crossing signal warning system. The signal system includes two flashing light signals and gates (one on each side of the crossing). The intersection of Highway 30 is also signalized, therefore providing traffic signal pre-emption at the railroad crossing. The crossing surface includes concrete crossing panels for the roadway and timber planks for the sidewalk crossings, 115# rail through the crossing, and 90# rail on either side of the crossing. The crossing does not meet the 1994 AASHTO standards for grade crossings (see Figure 2-14).

Maple Street
(Facing South)



MAPLE STREET PROFILE



MAPLE STREET PLAN

MAPLE STREET PLAN AND PROFILE

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FIGURE 2-14

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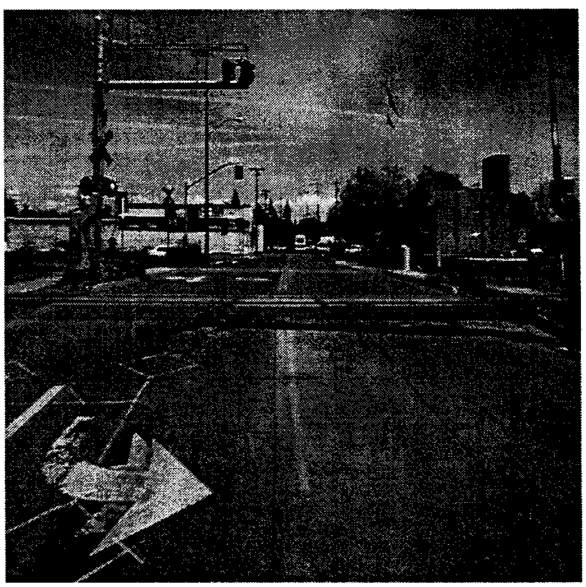
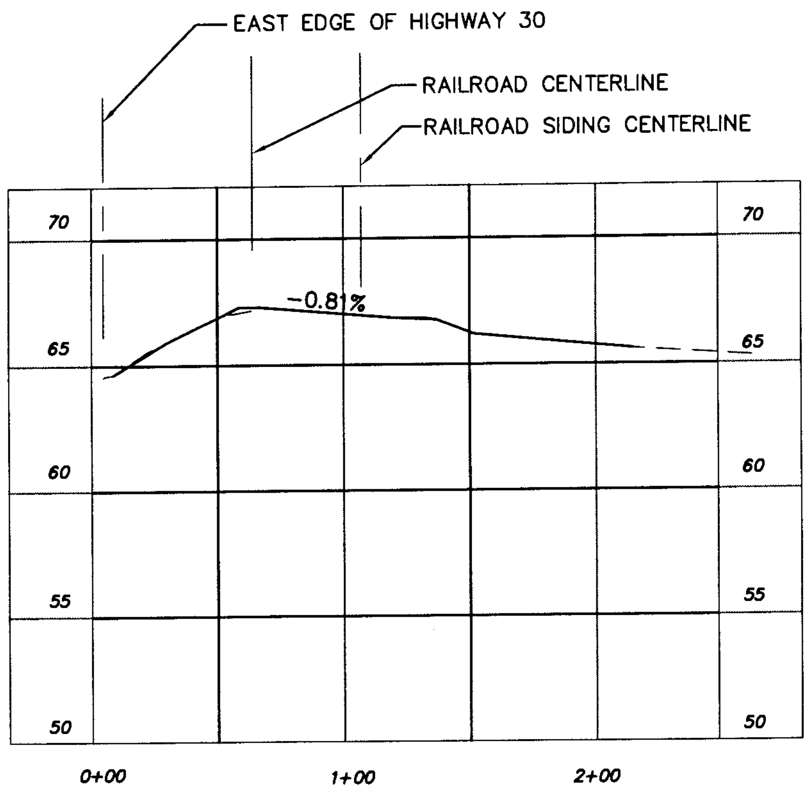
Columbia Avenue. (M.P. 125.71)

Columbia Avenue is a public crossing with an active crossing signal system at the crossing. The crossing devices are interconnected with the adjacent traffic signal on Highway 30. The crossing surface is similar to the previous crossings, with concrete panels in the roadway portion, timber sidewalk crossings, 115# rail in the crossing, and 90# rail outside the crossing. This is a two-track crossing; the mainline track is closer to Highway 30 and a siding track is located to the east. A third track begins just north of the existing crossing, but does not extend through the roadway. The crossing does not meet the 1994 AASHTO standards for grade crossings (see Figure 2-15).

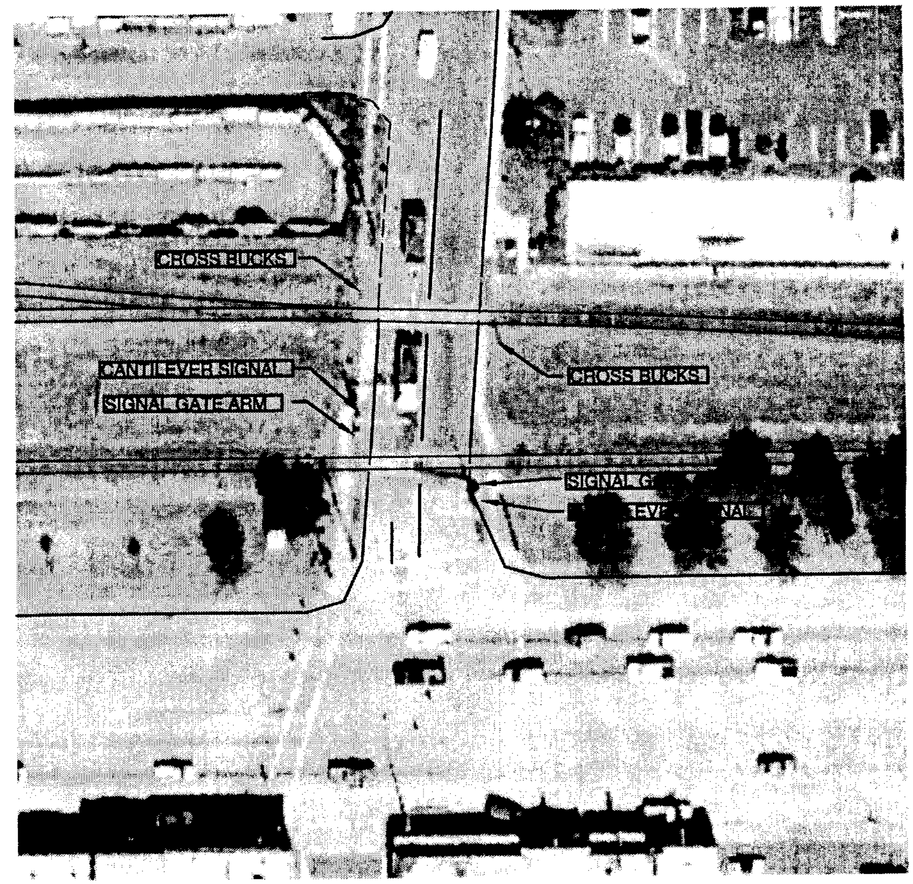


Columbia Avenue
(Facing East)

NORTH



COLUMBIA AVE PROFILE



COLUMBIA AVE PLAN

COLUMBIA AVENUE PLAN AND PROFILE

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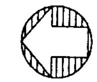
FIGURE 2-15

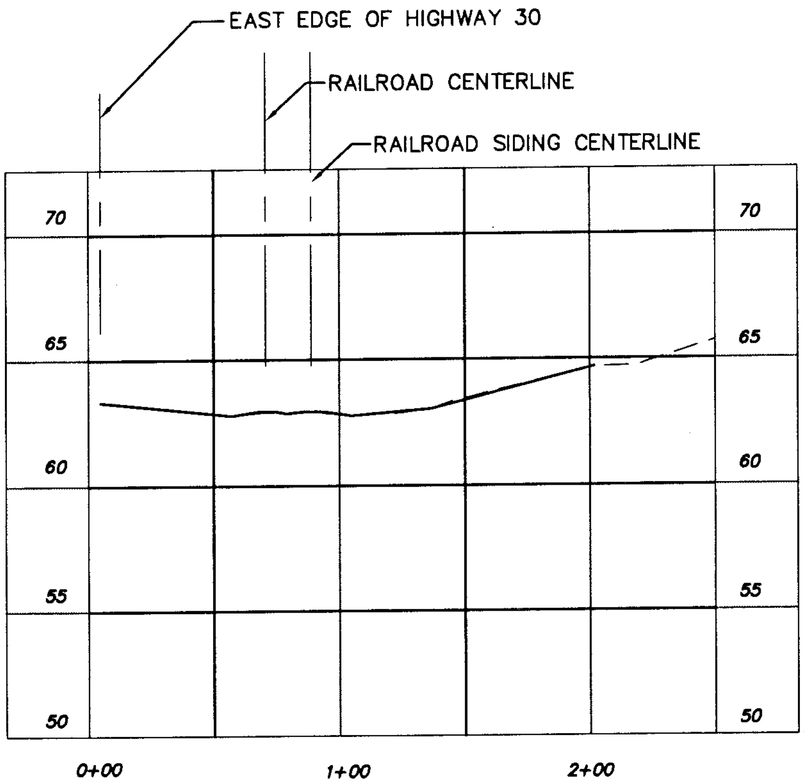
5225\DWGS\FINAL REPORT\5225F215

Williams Street. (M.P. 125.5)

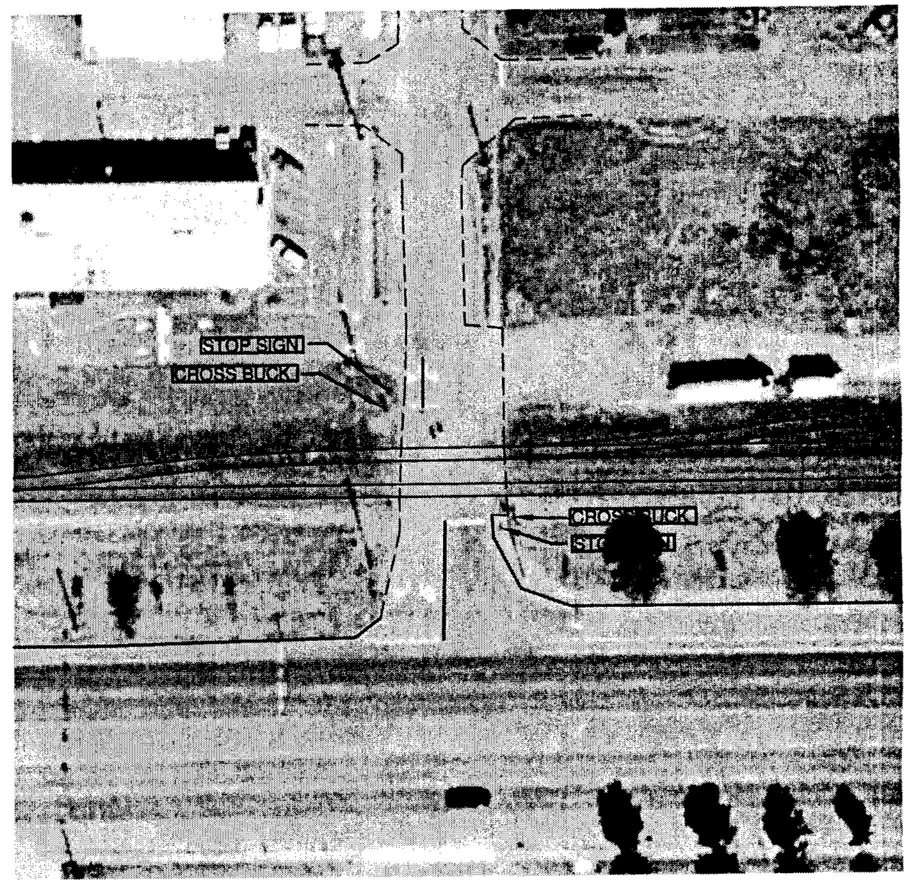
Williams Street is a two-track public crossing protected passively with stop signs at the crossing and Highway 30. The crossing surface is asphalt. The rail through the crossing is similar to the other crossings with 115# rail in the crossing and 90# rail outside the crossing. The crossing meets the 1994 AASHTO standards for grade crossings (see Figure 2-16).

Williams Street
(Facing North)





WILLIAMS STREET PROFILE



WILLIAMS STREET PLAN

WILLIAMS STREET PLAN AND PROFILE

Scappoose Rail Crossing Corridor Study

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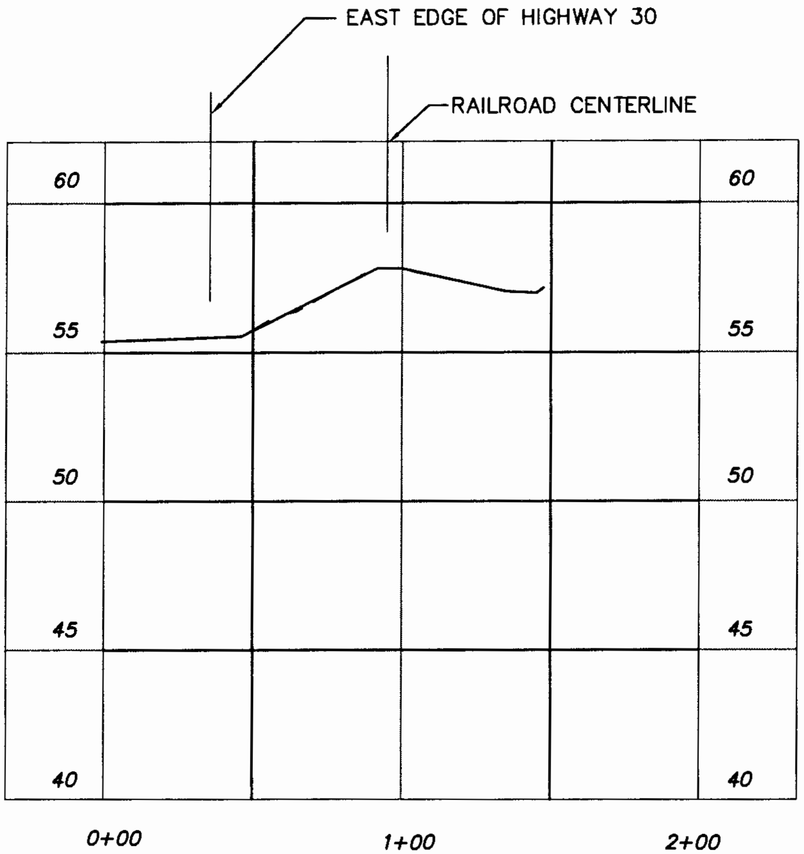
FIGURE 2-16

5225\DWGS\FINAL REPORT\5225F216

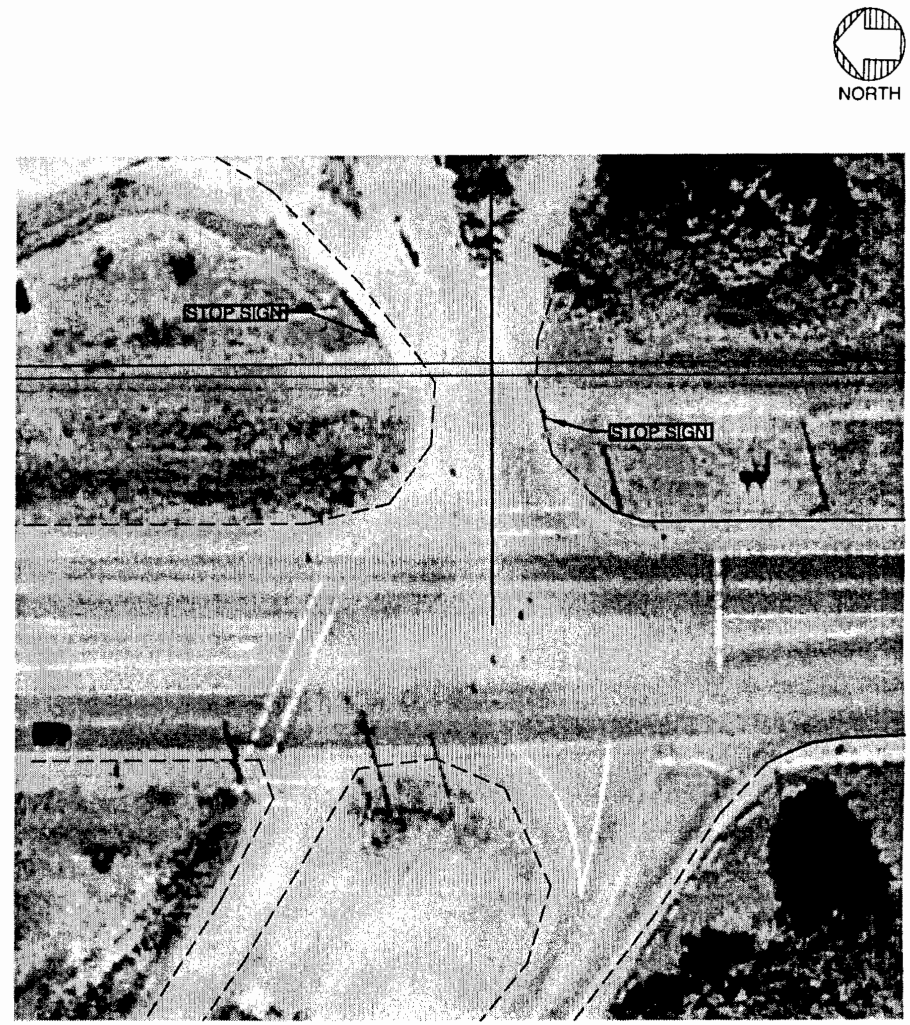
Crown-Zellerbach Logging Road. (M.P. 125.3)

Crown-Zellerbach Logging Road is a private crossing with a passive signal system. Stop signs require roadway traffic to stop before reaching the crossing. The crossing is constructed with an asphalt wearing surface, 115# rail, and 90# rail just outside the crossing area. The asphalt in the crossing is failing as a result of heavy truck traffic that serves the rock quarry located just east of the crossing. The crossing does not meet the 1994 AASHTO standards for grade crossings (see Figure 2-17).

Crown-Zellerbach Road
(Facing South)



CROWN-ZELLERBACH LOGGING ROAD PROFILE



CROWN-ZELLERBACH LOGGING ROAD PLAN

CROWN-ZELLERBACH LOGGING ROAD PLAN AND PROFILE

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FIGURE 2-17

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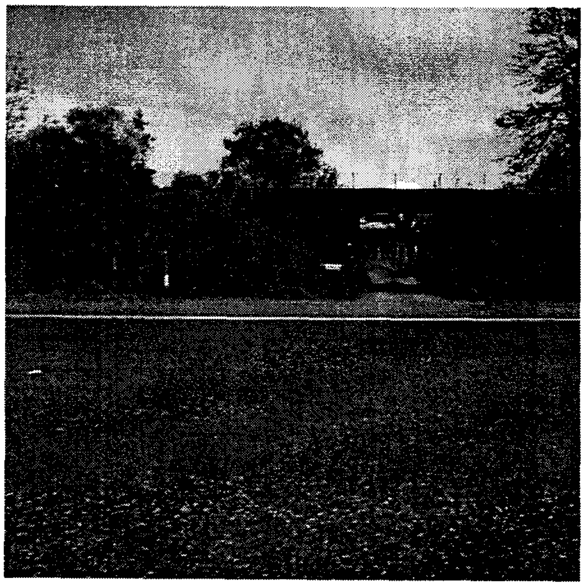
Private Crossing #3. (M.P. 125.1)

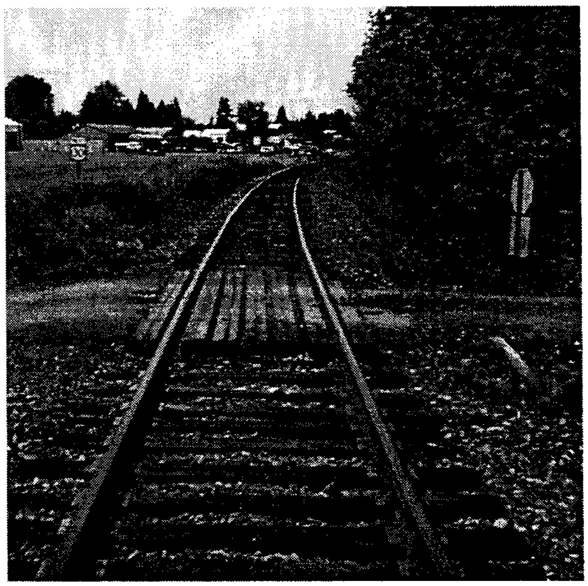
North of Crown-Zellerbach Logging Road, there is an existing private roadway under-crossing that has minimal side clearance. The railroad bridge consists of a four-span timber trestle for a single track. Because the crossing is grade separated, no signal system is required.



Private Crossing #3
(Facing East)

Private Crossing #4. (M.P. 124.8)

Further north, there is an existing private crossing serving a residential property. The crossing has a wooden surface, a stop sign on the east side, an asphalt approach from Highway 30, and a gravel approach east of the crossing.

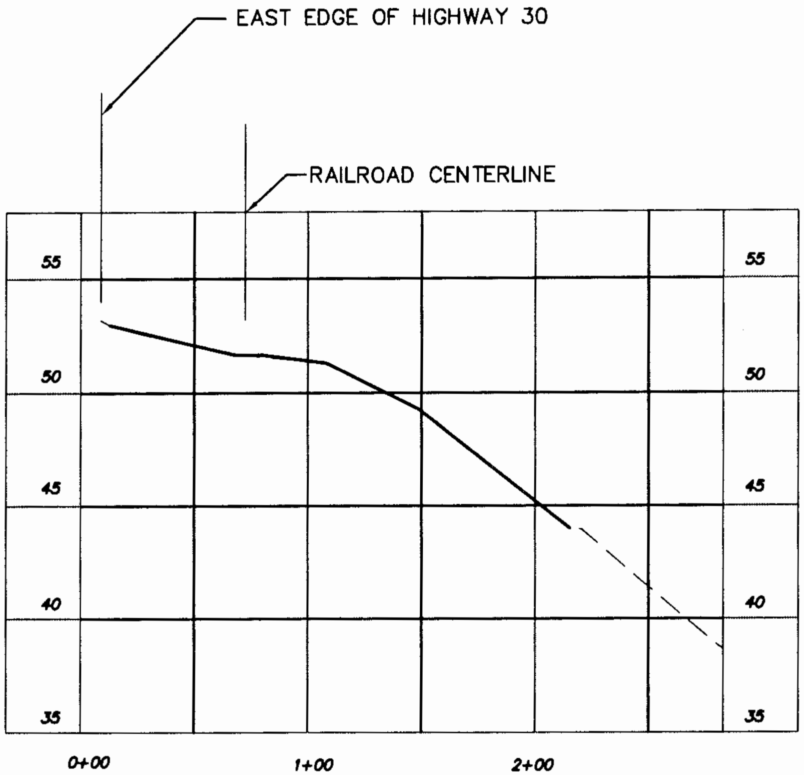


Private Crossing #4 (Facing North)

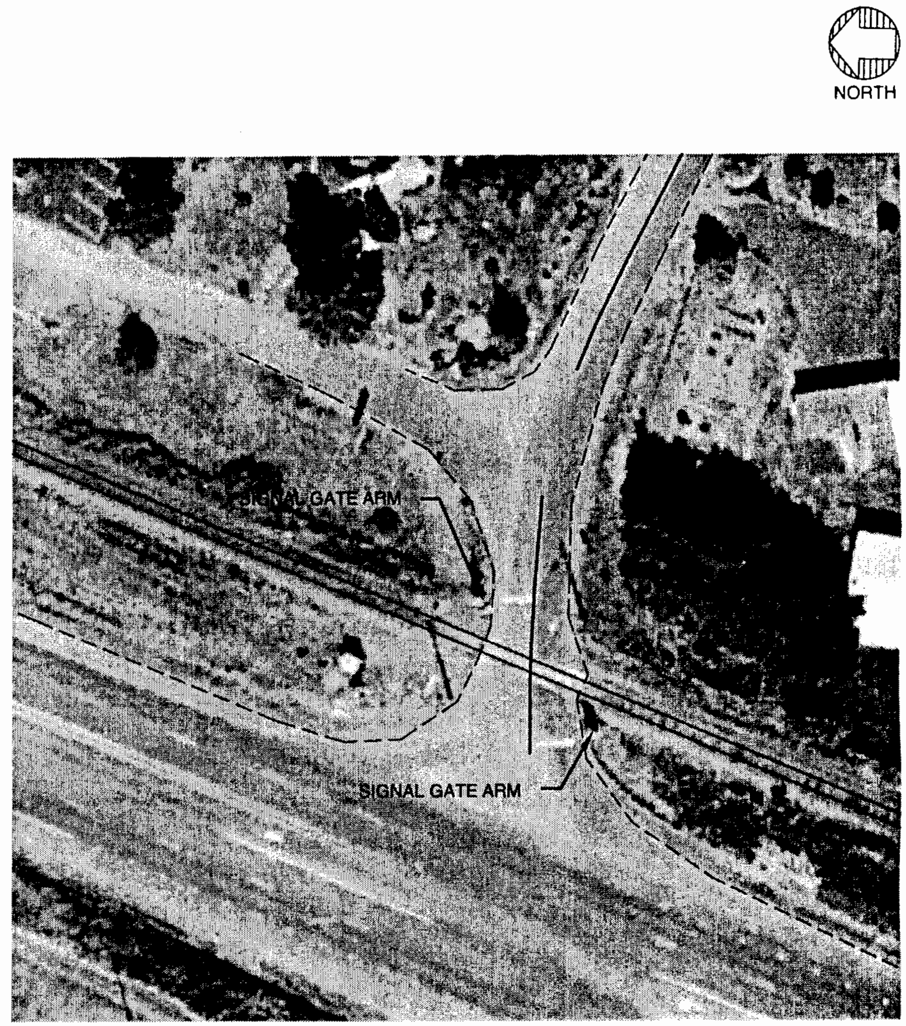
West Lane Road. (M.P. 124.1)

West Lane Road is a public crossing with an active signal system. The signal system devices are flashing light signals and gates. The rail through the crossing is similar to the other crossings with 115# rail in the crossing and 90# rail outside the crossing. The crossing surface consists of concrete crossing panels with asphalt roadway approaches. There are no sidewalks provided along West Lane Road, and the crossing is slightly lower in elevation compared to Highway 30. The crossing meets the 1994 AASHTO standards for grade crossings (see Figure 2-18).

West Lane Road
(Facing North)



WEST LANE ROAD PROFILE



WEST LANE ROAD PLAN

WEST LANE ROAD PLAN AND PROFILE

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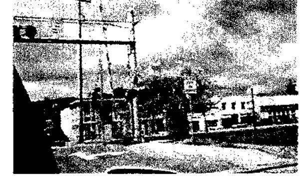
FIGURE 2-18

5225\DWGS\FINAL REPORT\5225F218

Chapter 3

Future Conditions Assessment

Chapter 3 – Future Conditions Assessment



The future conditions assessment quantified how the study area's planned transportation system would operate assuming forecast 2025 traffic volumes and rail operations. The purpose of this assessment was to identify potential system deficiencies from both roadway and rail perspectives.

FUTURE TRANSPORTATION FACILITIES

Roadway Elements

The City of Scappoose TSP, adopted in 1997, identified a total of 65 transportation improvements that were deemed necessary to serve the needs of vehicular, bicycle, and pedestrian traffic within the City of Scappoose through 2015. Of the 65 listed transportation improvements, some were found to be pertinent to this rail crossing corridor study, including several new street connections and future signalized intersections along Highway 30. An illustration of the City of Scappoose future street classification and traffic signal locations was provided in Figure 2-1. In addition to the planned improvement projects identified in the City of Scappoose TSP, ODOT has identified three near-term projects involving roadway improvements within the study area. Key planned improvement projects within the study corridor are highlighted below.

City of Scappoose Improvement Projects (City of Scappoose TSP)

The City of Scappoose TSP identifies five key transportation improvements that affect the study corridor. Only one of these projects is currently funded.

Havlik Drive Extension

As planned, a new roadway would connect Havlik Drive with 6th Street to the east. This project involves modification of the existing Highway 30/Havlik Drive signalized intersection to accommodate an east approach, conversion of the existing at-grade rail crossing near Havlik Drive from a private to a public crossing, and construction of a new roadway (2nd Street) to connect Havlik Drive and 6th Street. If funded and constructed, this improvement would provide alternative access to properties located south and east of Scappoose High School.

Old Portland Road Realignment

Old Portland Road is currently stopped-controlled at its intersection with Highway 30 just south of High School Way. At this intersection, Old

Portland Road intersects Highway 30 at a less than desirable angle of 25 degrees. As planned, the current Highway 30/Old Portland Road intersection would be closed and Old Portland Road would be realigned to connect with Walnut Street (the west approach to the Highway 30/High School Way signalized intersection). If funded and constructed, this improvement would provide alternative signalized access for properties in the southwest quadrant of the city and would also significantly improve the safety of motorists using Old Portland Road to access Highway 30.

Two-Way Operations o Columbia Avenue

Columbia Avenue is a designated Major Collector and serves as the primary roadway for traffic with origins/destinations east of the city. Columbia Avenue currently maintains two-way operations east of Highway 30 and only one-way (westbound) operations west of Highway 30. As planned, Columbia Avenue would be converted to two-way operations west of Highway 30, requiring the elimination of existing on-street parking and widening of the roadway. Providing two-way operations on Columbia Avenue would enhance local street circulation patterns east of Highway 30 and would significantly improve access to Highway 30 from the post office. This project is not currently funded.

Williams Street Extension and Traffic Signal

The City of Scappoose TSP calls for the extension of Williams Street west of Highway 30 to 1st Street and the signalization of the Highway 30/Williams Street intersection. If funded and constructed, these improvements would enhance local street connectivity and improve current Williams Street access to and from Highway 30.

Scappoose-Vernonia Road/Crown-Zellerbach Logging Road Realignment

The eastbound and westbound approaches to the Highway 30/Scappoose-Vernonia Road/Crown-Zellerbach Logging Road intersection are offset by approximately 200 feet. As proposed, the unsignalized Scappoose-Vernonia Road approach would be realigned to the north where it would tie into the existing Highway 30/Crown-Zellerbach Logging Road signalized intersection. In addition, the City of Scappoose TSP identifies the upgrade of the Crown-Zellerbach Logging Road to Major Collector cross-section standards to provide improved access to the developable properties in the northeast quadrant of the city. This project will be funded by ODOT as described below.

While not identified in the TSP or the preceding list of projects, the City of Scappoose is currently extending Second Street from its existing terminus north to Crown-Zellerbach Logging Road. This local street connection will ultimately lead to alternative access to Highway 30 after completion of the planned ODOT improvement projects described below.

ODOT Improvement Projects

In accordance with, and in addition to, the planned improvement projects identified in the City of Scappoose TSP, ODOT has identified three projects involving roadway improvements within the study area.

Scappoose-Vernonia Road Realignment (STIP)

ODOT has placed the Highway 30/Scappoose-Vernonia Road intersection realignment project on its Statewide Transportation Improvement Project (STIP) list. This project will realign Scappoose-Vernonia Road to intersect Highway 30 opposite the Crown-Zellerbach Logging Road and will include modification of the existing Highway 30/Crown-Zellerbach Logging Road intersection. The project is in the beginning stages of design with construction slated to begin in 2004.

Highway 30 Preservation (STIP)

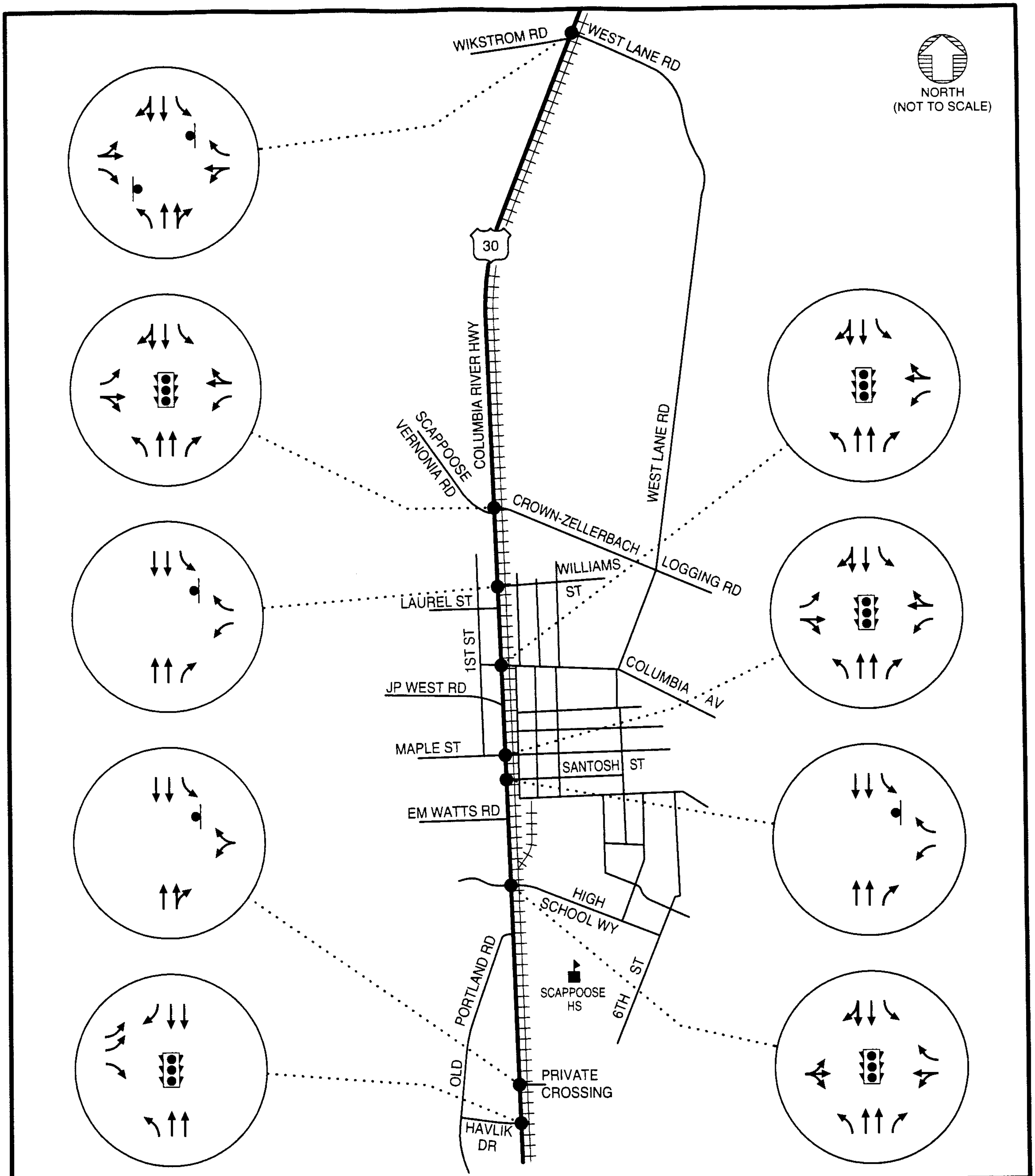
ODOT has identified a STIP project to overlay the asphalt surface of Highway 30 between Laurel Avenue and Bennett Road. This is a preservation project that is slated to occur after the Scappoose-Vernonia realignment project is completed.

Crown-Zellerbach (OTIA)

As part of the Oregon Transportation Investment Act (OTIA), funds have been allocated by ODOT to widen and improve the Crown-Zellerbach Logging Road from Highway 30 to West Lane Road. Design efforts for this project began in late summer 2002.

2025 Traffic Volume Projections

2025 traffic volumes were forecast for two growth scenarios. Scenario #1 was a "base" growth scenario in which traffic volumes were derived based on historical growth trends and the projected growth rates identified within the City of Scappoose TSP. Scenario #2 was a "full build" growth scenario that included the growth assumptions of the "base" growth scenario in addition to potential growth not previously identified within the City of Scappoose TSP. Under both growth scenarios, the Scappoose-Vernonia realignment and the Crown-Zellerbach Logging Road upgrade improvements were assumed to be in place and existing traffic volumes were rerouted accordingly (these improvements were assumed because funding has been secured for their design and they are considered of high priority by the City of Scappoose). Figure 3-1 illustrates the assumed future lane configurations and traffic control devices at the study intersections for the "base" growth scenario while Figure 3-2 illustrates the layout of the study intersections under the assumed "full build" growth scenario.



BASE GROWTH SCENARIO 2025 LANE CONFIGURATIONS AND TRAFFIC CONTROL DEVICES

LEGEND

- STOP SIGN
- TRAFFIC SIGNAL

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FIGURE 3-1

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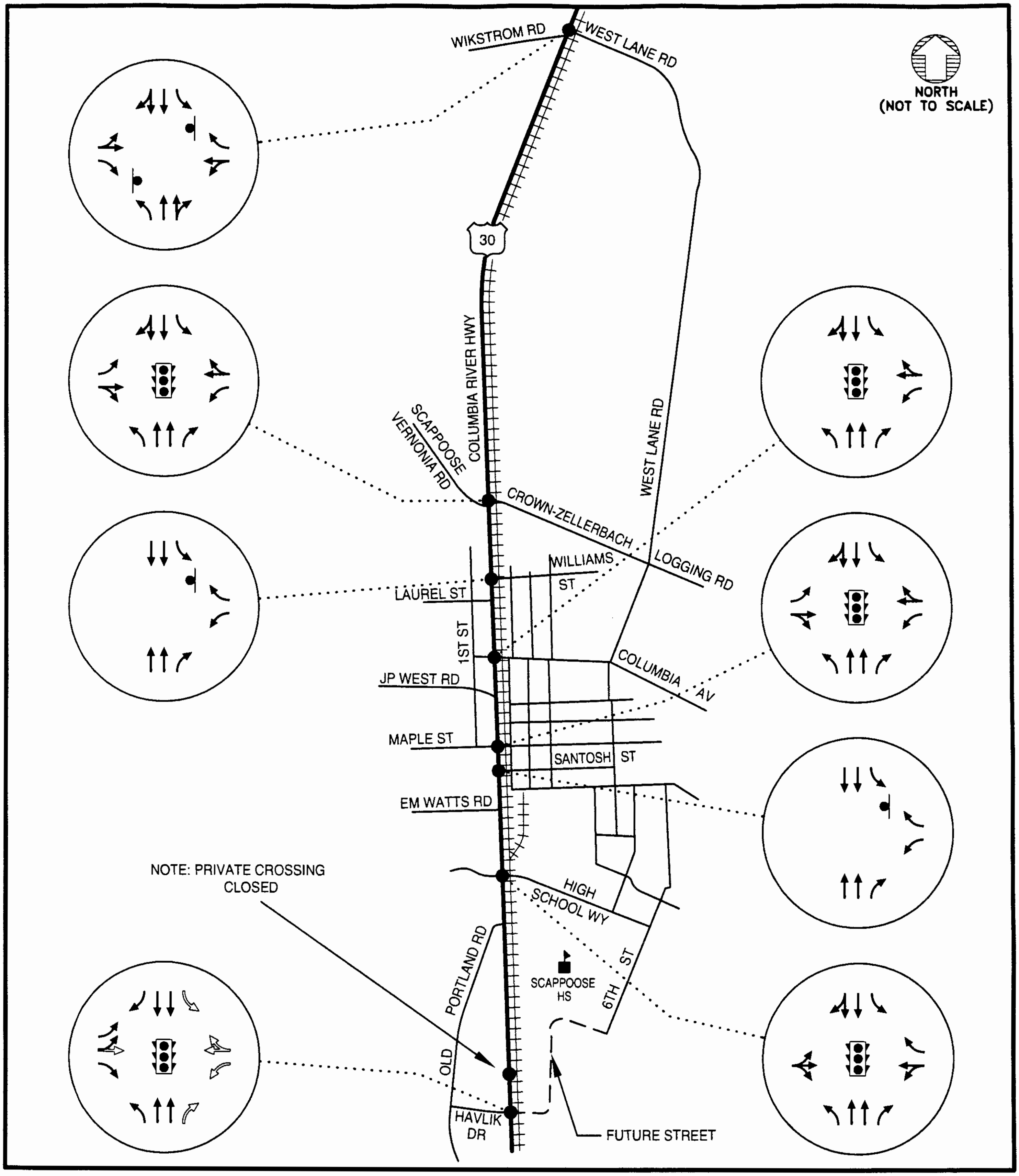

FULL BUILD GROWTH SCENARIO 2025 LANE CONFIGURATIONS AND TRAFFIC CONTROL DEVICES

LEGEND

- FUTURE LANE
- STOP SIGN
- TRAFFIC SIGNAL

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FIGURE 3-2

5225\DWGS\FINAL REPORT\5225F302

Scenario #1: Base Growth

The growth rate for Highway 30 within the study area was determined based on a review of the annual average daily traffic (ADT) volumes at milepost 19.53 (southern City of Scappoose limits) between 1995 and 2000. Based on that review, the ADT on Highway 30 has increased by an average of 2-percent per year. The 2-percent per year growth rate was applied to northbound and southbound through traffic at each study intersection.

The growth rates for side street traffic were determined by comparing the forecast traffic volumes documented in the City of Scappoose TSP to existing traffic counts. The individual growth rates for each side street were calibrated to ensure that individual link volumes on the side street were consistent with the volume projections identified in the City of Scappoose TSP (and then carried forward 10 years). Overall, the City of Scappoose has grown at a faster rate than was anticipated by the City of Scappoose TSP and the only study area links where accelerated growth hasn't occurred are Maple Street (east of Highway 30) and Scappoose-Vernonia Road. Table 3-1 is a summary of the calibrated side street growth rates used to estimate 2025 traffic volumes.

Table 3-1
Side Street Growth Rates

Side Street*	1995 Existing Link Volume (PM Peak)	2015 Future Link Volume** (PM Peak)	2002 Observed Link Volume (PM Peak)	Calibrated Growth Rate (PM Peak)
High School Way (East of Highway 30)	195	490	475	1%
Maple Street (East of Highway 30)	160	350	180	6%
Maple Street (West of Highway 30)	180	220	210	1%
Columbia Avenue (East of Highway 30)	300	620	450	3%
Scappoose-Vernonia Road (West of Highway 30)	345	430	300	1%

* *A 1-percent per year growth rate was assumed for all side streets not listed in Table 1.*
** *2015 future link volumes are based on the No-Build Alternative identified in the City of Scappoose TSP.*

Scenario #2: Full Build Growth

The "full build" growth scenario accounted for specific growth in three sectors of the city in addition to incorporating the growth assumptions of the "base" growth scenario. These three areas were identified by city staff and reflect potential growth opportunities not foreseen by the City of Scappoose TSP. It should be noted that there were no formal land use applications under consideration by the City of Scappoose at the time this report was prepared for any of the three sites. Traffic impact studies would be required in conjunction with any land use proposal. The three assumed growth areas are:

- 435 acres of light industrial use in the vicinity of the Scappoose airport,
- A commercial center redevelopment of the Steinfeld's Factory site, and
- An office/commercial center in the northwest quadrant of the Highway 30/Havlik Drive intersection (assuming rezoning of the property).

Estimates of daily and weekday a.m. and p.m. peak hour vehicle trip ends for the three assumed developments were calculated from empirical observations at other similar developments. These observations were obtained from the standard reference manual, Trip Generation, 6th Edition, published by the Institute of Transportation Engineers (Reference 6). Table 3-2 is a summary of the net new trip generation profile for the potential developments by assumed land use (all trip ends shown in Table 3-2 have been rounded to the nearest five trips).

Table 3-2
Trip Generation Summary*

Land Use	Size (Land Use)	Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
			Total	In	Out	Total	In	Out
Airport Industrial Park	435 acres (Light Industrial)	1,700	225	185	40	220	45	175
Steinfeld's Factory Commercial Redevelopment	100,000 s.f. (Shopping Center)	4,430	100	65	35	410	190	220
Havlik Drive Office/Commercial Development	175,000 s.f. (Office/Shopping Center)	6,270	300	205	95	720	305	415
Total Net New Trips		12,400	625	455	170	1,350	540	810

* *For planning purposes only. No specific development proposals are represented by this analysis.*

As shown in Table 3-2, these three developments, when combined, were projected to generate approximately 12,400 weekday net new daily trips, of which approximately 625 trips would occur during the weekday a.m. peak hour and approximately 1,350 trips would occur during the weekday p.m. peak hour. These estimates account for the potential for pass-by trips and the internalization of trips generated between multiple on-site land uses.

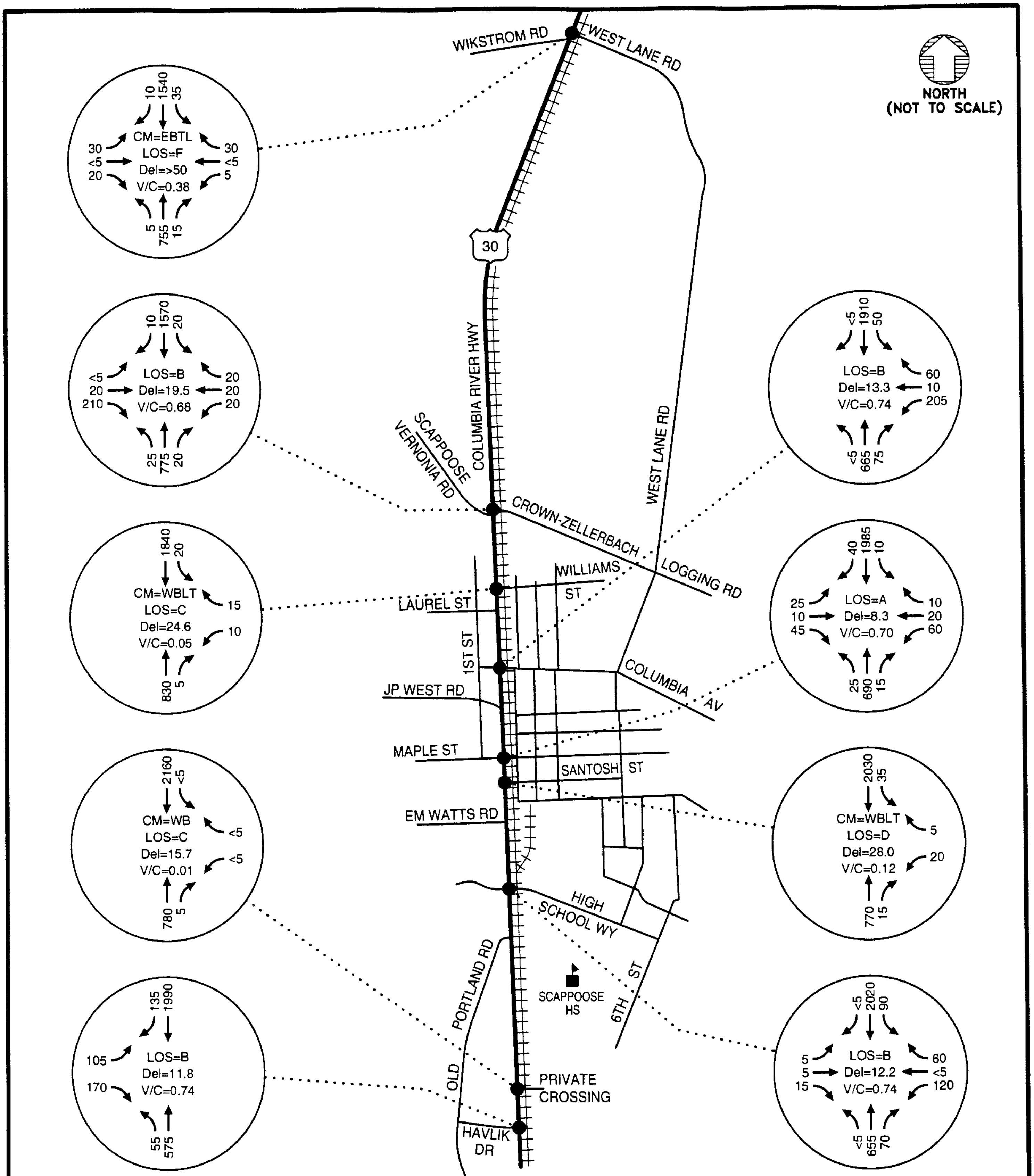
FUTURE WEEKDAY AM AND PM PEAK HOUR OPERATIONS

Signalized Intersections

Five study intersections were analyzed as signalized intersections under 2025 forecast traffic conditions. They include:

- Highway 30/Havlik Drive,
- Highway 30/High School Way,
- Highway 30/Maple Street,
- Highway 30/Columbia Avenue, and
- Highway 30/Crown-Zellerbach Logging Road/Scappoose-Vernonia Road.

Using the weekday a.m. and p.m. peak hour traffic volumes, v/c ratios and levels of service were calculated for the five signalized study intersections, as shown in Figures 3-3 and 3-4 for the "base" growth scenario and Figures 3-5 and 3-6 for the "full build" growth scenario.



BASE GROWTH SCENARIO
2025 TRAFFIC CONDITIONS
WEEKDAY AM PEAK HOUR

LEGEND
CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/ CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE DELAY (SIGNALIZED)/ CRITICAL MOVEMENT DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

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FIGURE 3-3

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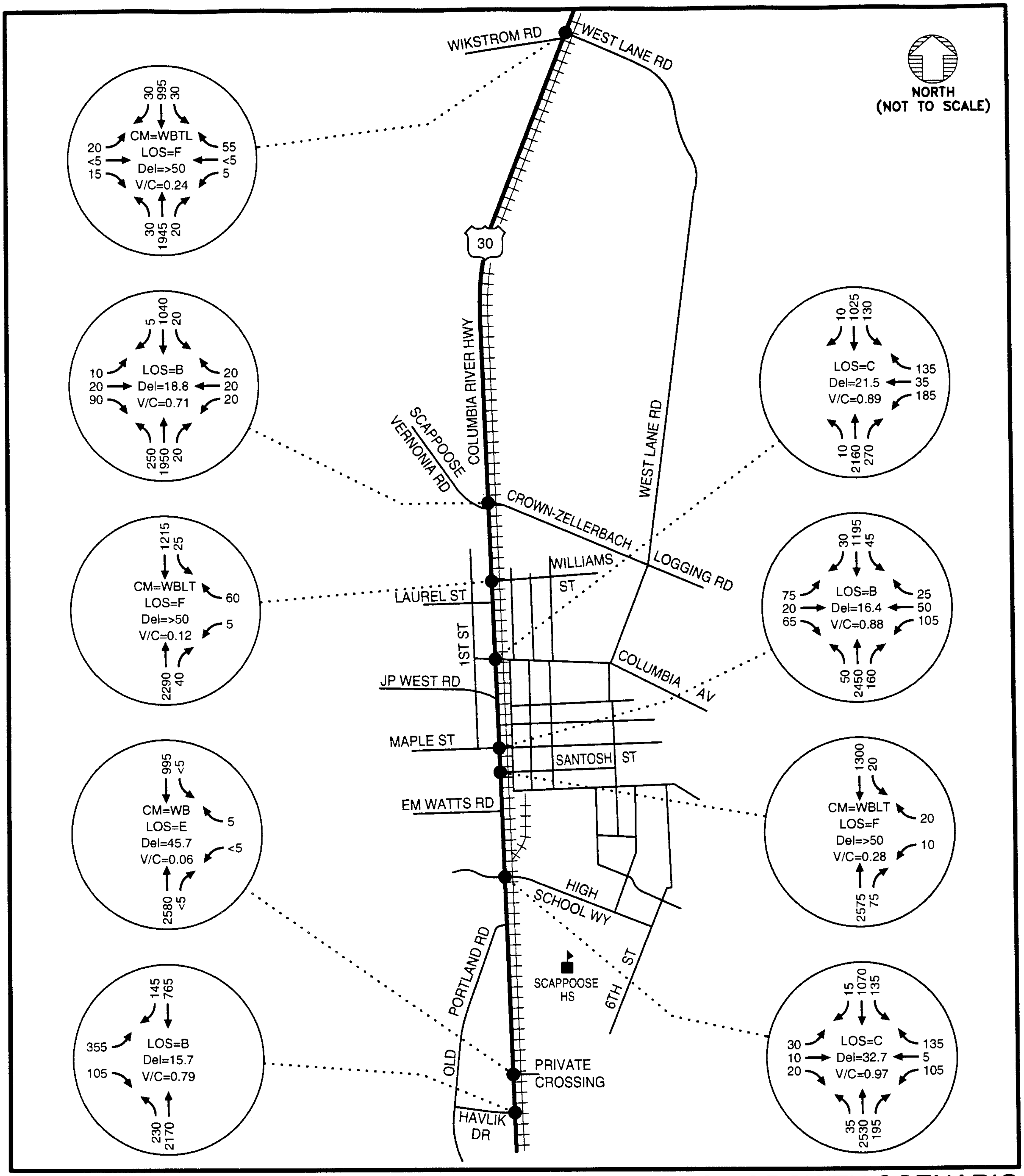

BASE GROWTH SCENARIO
2025 TRAFFIC CONDITIONS
WEEKDAY PM PEAK HOUR

LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/ CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE DELAY (SIGNALIZED)/ CRITICAL MOVEMENT DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

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FIGURE 3-4

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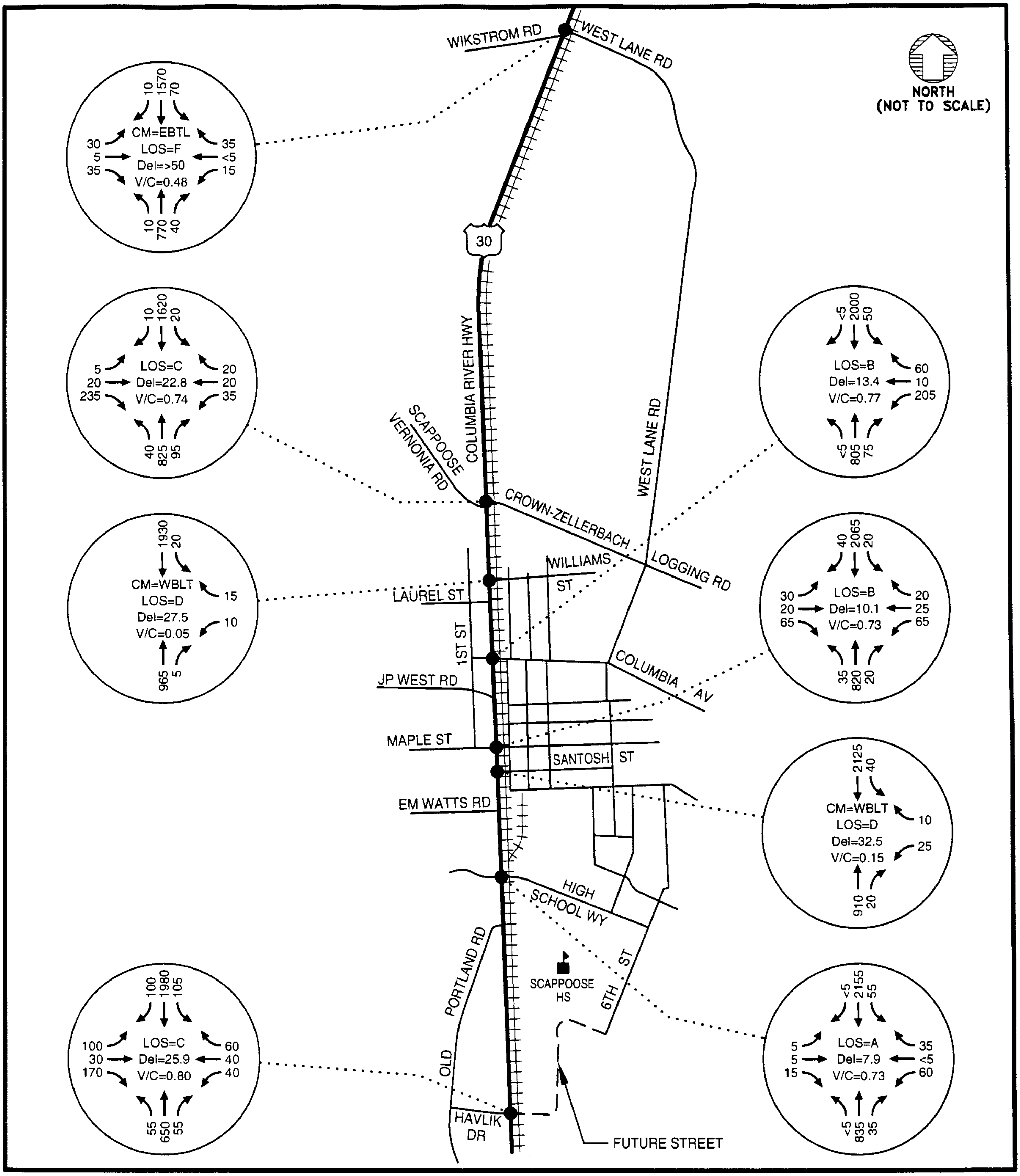

FULL BUILD GROWTH SCENARIO
2025 TRAFFIC CONDITIONS
WEEKDAY AM PEAK HOUR

LEGEND
- CM = CRITICAL MOVEMENT (UNSIGNALIZED)
- LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/ CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
- Del = INTERSECTION AVERAGE DELAY (SIGNALIZED)/ CRITICAL MOVEMENT DELAY (UNSIGNALIZED)
- V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

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FIGURE 3-5

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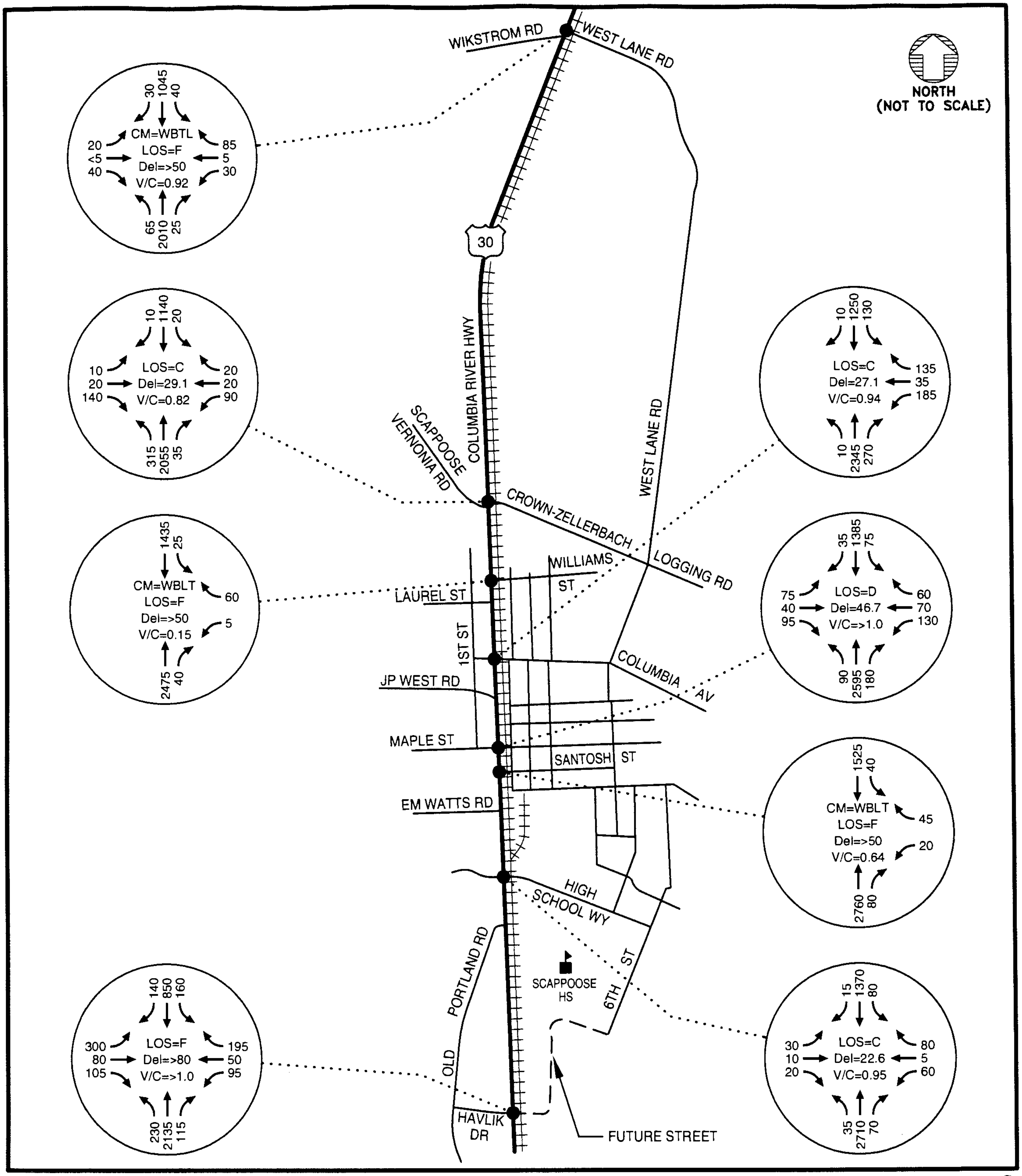

FULL BUILD GROWTH SCENARIO
2025 TRAFFIC CONDITIONS
WEEKDAY PM PEAK HOUR

LEGEND
CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/ CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE DELAY (SIGNALIZED)/ CRITICAL MOVEMENT DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

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FIGURE 3-6

5225\DWGS\FINAL REPORT\5225F306

"Base" Growth Scenario

As indicated in Figures 3-3 and 3-4, all of the signalized study intersections were forecast to operate with acceptable levels of service during the weekday a.m. and p.m. peak hours.

With the exception of the Highway 30/Columbia Avenue intersection, all of the signalized study intersections were forecast to operate within ODOT's v/c ratio standard during the weekday a.m. peak hour. None of the signalized study intersections was forecast to meet ODOT's v/c ratio standard during the weekday p.m. peak hour, though all of the intersections are forecast to have adequate capacity to accommodate the forecast demand.

"Full Build" Growth Scenario

As indicated in Figures 3-5 and 3-6, all of the signalized study intersections were forecast to operate with acceptable levels of service during the weekday a.m. peak hour. With the exception of the Highway 30/Havlik Drive intersection, all of the signalized study intersections were forecast to operate with acceptable levels of service during the weekday p.m. peak hour.

During the weekday a.m. peak hour, only the Highway 30/High School Way and Highway 30/Maple Street intersections was forecast to operate within ODOT's v/c ratio standard. None of the signalized study intersections were forecast to meet ODOT's v/c ratio standard during the weekday p.m. peak hour.

Unsignalized Intersections

The following four study intersections were analyzed as unsignalized intersections under 2025 forecast traffic conditions:

- Highway 30/Candle Factory Site-Access,
- Highway 30/Santosh Street,
- Highway 30/Williams Street, and
- Highway 30/West Lane Road.

The level of service and v/c ratio results for the four unsignalized study intersections during the weekday a.m. and p.m. peak hours are summarized in Figures 3-3 and 3-4 for the "base" growth scenario, and Figures 3-5 and 3-6 for the "full build" growth scenario.

"Base" Growth Scenario

As indicated in Figures 3-3 and 3-4, the critical movements of all the unsignalized study intersections, with the exception of the Highway 30/West Lane Road intersection, were forecast to operate with acceptable levels of service during the weekday a.m. peak hour. Only the critical movement of the Highway 30/Candle Factory access intersection was forecast to operate with an acceptable level of service during the weekday p.m. peak hour.

All of the unsignalized study intersections were forecast to operate within ODOT's v/c ratio standard during both the weekday a.m. and p.m. peak hours.

"Full Build" Growth Scenario

As indicated in Figures 3-5 and 3-6, the critical movements of all the unsignalized study intersections, with the exception of Highway 30/West Lane Road, were forecast to operate with acceptable levels of service during the weekday a.m. peak hour. By comparison, none of the unsignalized study intersections was forecast to have a critical movement that operates with an acceptable level of service during the weekday p.m. peak hour.

All of the unsignalized study intersections were forecast to operate within ODOT's v/c ratio standard during the weekday a.m. peak hour. With the exception of the Highway30/West Lane Road intersection, all of the unsignalized study intersections were forecast to operate within ODOT's v/c ratio standard during the weekday p.m. peak hour.

IMPLICATIONS OF 2025 ANALYSIS SCENARIO

The future year analyses were intended to provide an understanding of long-term capacity and improvement needs so that potential grade crossing modifications could be considered in the context of the larger transportation system. The "base" growth scenario demonstrated that some local intersections would require capacity improvements to meet travel demand posed by regional growth and local development under the adopted City of Scappoose Comprehensive Plan. The "full build" growth scenario demonstrated that additional capacity improvements would be necessary to accommodate the three assumed potential developments. The results of the "full build" growth scenario should not be interpreted to imply that future development such as the three assumed land uses cannot be accommodated, but rather that additional infrastructure would be necessary to accommodate them. Also, it is conceivable that the v/c standards may be reduced, meaning that although delays will be longer and the corridor more congested than today, not every intersection would require mitigation.

From the future year analyses, it was concluded that capacity or circulation improvements should be considered at key unsignalized intersections along Highway 30, including West Lane Road, Williams Street, and Santosh Street. Other roadway segments having signalized access to Highway 30, such as Columbia Avenue and High School Way, were also identified as requiring improvements. Each of these intersections was forecast to operate at a level below standard within the next 25 years.

It was recognized that the questions surrounding how these intersections were to be improved needed to be considered in the context of overall corridor needs and impacts associated with adjacent grade crossings. The future year analyses also demonstrate that additional infrastructure and circulation issues would need to be investigated as specific development plans are considered for each of the three sites.

Railroad Elements

Just as the roadway network can expect future growth in travel demand and corresponding capacity improvement needs, the PNWR rail line will also grow. The following section provides an overview of the anticipated rail traffic growth, equipment needs, and emerging technologies.

Future PNWR Freight Operations

As stated in the Existing Conditions Assessment, the PNWR currently fields four trains daily, which operate on the "A"-Line from Portland to Astoria and include the log train, the rock train, and two local hauler trains. These trains generally operate five days a week (Monday – Friday), and occasionally on Saturdays. Each of these trains makes round trips, for a total of eight daily movements through the City of Scappoose. PNWR's projections suggest an additional two movements each by the rock train and the log train. PNWR's projections also suggest that an additional movement for each of the local haulers will be needed (though they may be only one-way trips), making a total of 14 movements that could operate through Scappoose on a daily basis.

At the time this report was prepared, PNWR was pursuing several contracts with future industries that could open along the Astoria Branch, including US Gypsum. US Gypsum is a large producer of wallboard. PNWR predicted that this company's rail needs would add two additional trains or four additional movements per day.

PNWR's long-range planning addressed the possibility of an ethanol plant opening at the Port of Westward. If the ethanol plant were to open, the railroad import large amounts of corn on unit corn trains, which generally consist of 110 cars, with each car averaging 62 feet in length. A 7,100-foot long train weighing approximately 13,000 tons would be very damaging to the existing rail system and would require PNWR to replace the existing 90# rail with 136# rail, as well as to replace some ties. The ethanol plant was predicted to add an additional three trains per week, for a total of six movements.

Based on the forecasted growth and capacity of the Astoria Branch, PNWR noted its plans to construct an additional mainline, creating a double track through town. The second track would be constructed 15 feet east of the existing mainline line track.

Expansion of I-5 Corridor

The I-5 Bi-State Corridor Study results that were released in 2002 indicate that the I-5 trade corridor between Seattle and Portland is already at maximum capacity for rail traffic. Amtrak would like to add several more trains. Burlington Northern Santa Fe Railroad (BNSF), the primary carrier for the corridor, will also have some future capacity needs. Several options are being considered to try to alleviate some of the rail traffic on this corridor. An alternative that might affect the Scappoose area is to double track the Astoria Branch from Portland to Goble, and build a rail bridge across the Columbia River from Goble to Kalama. This new connection could be used as an alternative rail route that would serve the southwestern Washington and northwestern Oregon areas.

Passenger Operations

ODOT has proposed a new Lewis and Clark excursion train to operate from May through September for 3 years (2003–2005). The Lewis and Clark train would operate once a day, departing Portland sometime in the morning hours and heading to Astoria. The train would make an intermediate stop in Rainer to pick up any additional passengers on their way to Astoria. After reaching Astoria there would be a five-hour dwell time before returning to Portland. While the proposed train would travel through the City of Scappoose, no stop is currently planned.

As the outlying communities continue to grow, there will be a demand for additional transportation facilities to supplement Highway 30. In the next 20 years, it is very feasible that a commuter train service could be operating from St. Helens to Portland. Common commuter rail system development practices are to try to maximize the use of existing freight rail infrastructure for commuter operations. Along the Astoria Branch there would have to be some track modification such as additional sidings and a new signal system to facilitate meets and passes of commuter and freight trains. A new train signal system would be a mandatory upgrade to protect the safety of passenger and freight traffic throughout the corridor.

Future Technology

The following section of this report presents technologies that the Class 1 railroads (UPRR and BNSF) were exploring at the time this report was prepared. Class 1 railroad efforts were considered important to the Scappoose rail corridor because short line railroads such as PNWR try to follow the industry standards operations and practices. If the Astoria branch's train traffic were to increase as forecast, some of the technologies highlighted below might be considered by the PNWR.

Automated Equipment Identifier Reader

Automated Equipment Identifier (AEI) technology, has already been installed on all Class 1 mainlines leading into Portland and allows for tracking equipment such as individual railcars. The benefit of AEI readers is that real-time lists of cars composing a train are now available to all shippers requiring this information.

Positive Train Separation

Railroads are testing several different positive train separation systems that could further reduce the already slim chance of a mainline collision (which account for approximately 2-percent of all train accidents) to see if the technology is feasible. This technology is based on combining the vital circuitry currently used to display wayside signals with locating the various trains on the system using GPS technology. Safe braking distances based on a train's speed, direction, tonnage, length, and work assignments are all calculated with an on-board computer to reduce the possibility of a crash by eliminating a single point of failure.

Track & Tie Systems

The Class 1's continue to make significant investments into research and development to find better components for the railroad track structure. These improvements include elastic fasteners, concrete and steel ties, improved metallurgy, and hardening for rail and switch components. Improvements in best management practices for construction and maintenance also affect overall quality of the track. Components that have been improved include use of sub-ballast, removal of all rail joints, use of track geometry cars, and use of push-button solar power switch machines.

AC Locomotive Technology and Distributed Power

More than 4,100 new alternating current (AC) traction locomotives have begun operating on the nations railroads. Three of the new locomotives can do the work of five older direct current (DC) traction locomotives. These new locomotives are also more fuel-efficient than the older ones and are subject to less mechanical breakdown, increasing both safety and efficiency. The significance for western railroads is the superior handling capability of AC locomotives on steep grades. Break-in-two's (when a train is physically broken and separated), which result from rough handling by DC locomotives and burnt traction motors common to DC locomotives, are a thing of the past for railroads operating the new locomotives.

Distributive Power

Distributive power has made a significant comeback in the Pacific Northwest. Distributive power or use of Distributive Power Units (DPU) is the practice of placing locomotives in the middle of or near the end of a train to help power the train over the steep grades. These locomotives are controlled remotely from the head-end locomotive using radio-technology. This method of operation has greatly increased capacity for the Union Pacific on the climb over the Blue Mountains en route to Portland. Previously, helper engines deployed to help trains ascend the mountain grades used up a tremendous amount of track capacity because they had to go back and forth over the mainline.

Electric Pneumatic Brake Systems

A new form of electrical control air braking, Electric Pneumatic Brake Systems (ECP), is currently being tested by a number of railroads in the United States. ECP uses modern electronic techniques to overcome the problems of air braking on long freight trains. The pure air control brake system invented by George Westinghouse in the 1860's (and still used by almost all freight trains in the U.S. and in many other parts of the world) suffers from two main problems: it takes a long time for the air messages to travel along the train and there is no graduated release. For example, the delay for a reduction in train line pressure to travel from the leading locomotive to the rear of a 150-car train can be 150 seconds. Also, brakes must be fully released and supply reservoirs must be fully recharged before the brakes can be reapplied. Electrical control can overcome these difficulties.

The benefits of ECP braking include: instantaneous response to the engineer's commands on all vehicles; graduated release of brakes; and continuous replenishment of reservoirs. With the new responsiveness of ECP braking, braking distances are reduced by 30 to 70 percent. This will allow shorter stopping distances and will, in turn, allow higher speeds. The improved train handling will reduce slack action, breakaways, and derailments, and will lead to a reduction in draft gear maintenance. These advantages may allow increases in train lengths.

Freight Reload (Transload) Logistical Systems

The logistics industry has realized for some time that the economics are beneficial when rail carload service is combined with local trucking at a facility located along the railroad. Known as Transload Facilities, these locations allow various commodities to be loaded or unloaded from a rail car then onto a truck for local distribution. Examples of transload operations include: asphalt, dry bulk, forest products, paper, coiled steel, lumber (reload), plastic pellets, scrap metal, cement, and compacted waste. Not only are commodities easier to distribute, but also shippers can receive competitive shipping rates from competing rail carriers.

Tank Car Enhancements

Enhancements to tank cars are the result of joint projects by the Association of American Railroads (AAR), the Federal Railroad Administration (FRA), and the Railway Progress Institute. Research to date has resulted in improvements to head shields, thermal protection, shelf couplers, and pressure relief devices, and has helped reduce train accidents with a release of hazardous materials by approximately two-thirds since 1980.

Transportation Technology Center

The latest rail transportation and safety improvements are taken from the drawing board to the test track at the 52-square mile Transportation Technology Center (TTC) in Pueblo, Colorado. TTC is a wholly owned subsidiary of the AAR and operates the facility, which was established in 1971, under a long-term contract with the U.S. Department of Transportation and the FRA. There are 48 miles of railroad track on-site devoted to testing all types of signal and safety devices and track components. The TTC has unique laboratory facilities for evaluating vehicle dynamics, structural integrity, and reliability, and is the focal point for all of North America's rail research, testing, and information exchange.

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Chapter 4

Opportunities and Constraints Assessment

Chapter 4 – Opportunities and Constraints Assessment

The opportunities and constraints assessment identifies potential roadway and rail improvement projects to mitigate existing and projected future transportation system deficiencies within the study corridor. During the assessment, the advantages and disadvantages of each of the candidate improvement projects were evaluated to develop a preferred improvement plan.

OVERVIEW

This chapter of the report presents improvement alternatives for three areas of focus: corridor-wide alignment options, grade crossing enhancements, and local project options. The chapter is organized to provide both a macro and micro level view of potential improvements and the relationships among the improvement projects. Conceptual cost estimates are provided to help the reader understand the order-of-magnitude costs associated with the various project alternatives.

The projects presented in this chapter were not prioritized and the project consultant team had made no project recommendations or endorsement when the alternatives were generated. As will be evident in reviewing the list of project alternatives, the preferred plan could not contain all of the improvements, as some projects are mutually exclusive. Further, the many of the projects identified do not directly relate to a rail crossing, but were developed to address overall transportation issues.

Both the Existing Conditions and Future Conditions Assessments identified several local access and circulation issues that relate to the study corridor. These circulation issues represent significant constraints to the corridor and are of concern to the community. As a result, several of the transportation improvements presented in this chapter were developed to address specific concerns/issues raised by PAC and TAC members as well as at the public meetings. Some of the key concerns/issues that were considered when during the development of the opportunities and constraints assessment are highlighted below:

- Developing an alternate route to High School Way in southeast Scappoose to mitigate congestion and reduce traffic in front of the high school.
- Creating two-way traffic operations on the west approach to the Highway 30/Columbia Avenue intersection or at an alternate location in the vicinity.
- Improving highway access during peak periods.
- Enhancing emergency service access to all parts of Scappoose.
- Reducing truck traffic on Columbia Avenue.

- Redeveloping the Highway 30/Scappoose-Vernonia Road/Crown-Zellerbach Logging Road intersection to improve circulation patterns within northeast Scappoose.
- Providing frontage roads along Highway 30 to reduce the reliance on Highway 30 to accommodate local trips.

The opportunities and constraints assessment was conducted in a tiered approach. First, potential improvement options were reviewed at a corridor-wide level to consider potential alignment options. Next, individual grade crossings were reviewed to determine the extent of improvement projects that would be necessary. Local access and circulation issues were then reviewed, including consideration of individual street intersection operations and traffic control devices. Finally, highway capacity improvement options were considered. The remainder of this chapter presents the opportunities and constraints assessment.

CORRIDOR-WIDE ALIGNMENT OPTIONS

At the corridor level, three potential highway/railroad realignment options were considered in an effort to reduce vehicle/train conflicts and enhance the safety and operations of the transportation system.

Corridor Option #1: Grade Separate the Highway 30/PNWR Rail Crossings

Corridor Option #1 entailed grade separating Highway 30 and the PNWR mainline to eliminate vehicle/train interactions. This could be accomplished by either raising or lowering the tracks throughout the entire corridor or by constructing a Highway 30 overpass/underpass at each or some of the planned rail crossings. An order of magnitude cost estimate for Corridor Option #1 was approximately $100 million.

Advantages:

- Provides complete separation of vehicle/bicycle/pedestrian traffic from rail traffic.
- Reduces rail crossing maintenance costs.
- Eliminates rail preemption at signalized intersections along Highway 30.

Disadvantages:

- Extensive infrastructure construction costs.
- Adverse right-of-way impacts.
- Adverse aesthetic impacts (e.g., elevated structures adjacent such as viaducts in close proximity to businesses and residences).

- Drainage complications if the mainline is lowered or an underpass is constructed.

Corridor Option #2: Realign the PNWR Railroad

Corridor Option #2 involved relocating the railroad from its current "highway tight" alignment to one further east away from the city core where the number of at-grade rail crossings could be minimized or eliminated completely. This project would require construction of approximately 6 miles of new mainline track, removal of the existing track, and the reconstruction of the existing roadway approaches to match the Highway 30 profile within the city limits. An order of magnitude cost estimate for Corridor Option #2 was approximately $17 million (estimate did not include right-of-way acquisition costs).

Advantages:

- Reduces potential for vehicle/train conflicts.
- Minimizes impacts to existing businesses and residences.
- Reduces rail crossing maintenance costs.
- Eliminates rail preemption at signalized intersections along Highway 30.

Disadvantages:

- Extensive infrastructure construction costs.
- Adverse right-of-way impacts.
- Requires preparation of an Environmental Impact Statement (EIS).
- Requires a spur rail line to service existing or planned rail-dependent businesses within the study corridor.

Corridor Option #3: Maintain Current Highway 30 and PNWR Alignments

Corridor Option #3 maintained the current horizontal alignment of both Highway 30 and the PNWR railroad and focused on developing enhanced at-grade rail crossings within the corridor. To maintain the existing horizontal alignments of both Highway 30 and the PNWR railroad, several issues concerning grade crossing equipment improvements, vertical profile alternatives, and local transportation improvement projects need to be addressed and balanced. These issues and several alternatives that would facilitate maintaining the current Highway 30 and the PNWR railroad alignments are presented below.

Grade Crossing Improvement Requirements

Assuming that the existing public rail/highway grade crossings along the rail corridor were to be maintained, all of them would ultimately require some level of improvement. In addition to geometric changes necessary to better meet design standards and increase intersection roadway capacity, safety enhancements – including the provision of active protection devices such as gates, lights, and bells – would be needed.

Pre-emption and Interconnect Requirements

For safety reasons, all of the grade crossings with active control devices would require an adjacent traffic signal on Highway 30. The traffic signal would be used to control the transfer of right-of-way from the roadway to train traffic as trains approach and use the grade crossing. The traffic signal is used to move any side street traffic waiting on the grade crossing approach to the highway before the train arrives, thereby ensuring that no vehicles are trapped on the crossing as the train approaches. This signal pre-emption process requires a communication connection, known as "interconnect", between the traffic signal equipment and the railroad equipment. The interconnect link allows the railroad equipment to communicate the approach and presence of a train to the traffic signal equipment.

Interconnect is currently provided at the grade crossings of Columbia Avenue, Maple Street, and High School Way. At each crossing, the active grade crossing devices (gates and bells) are physically interconnected with the adjacent traffic signal on Highway 30. When a train approaches the crossing, the traffic signal's normal operations are pre-empted and the traffic signal shifts focus to moving vehicles off of the roadway approach with the grade crossing. Signs are also illuminated on the highway to prevent highway traffic from turning onto the grade crossing.

The Existing Conditions chapter noted that the three grade crossings with pre-emption capability currently use a flashing yellow light on the side streets to clear out the grade crossing during a train's approach. This technology is gradually being replaced (as grade crossings are upgraded) by new equipment that provides a "green clearout." Essentially, instead of using up a flashing yellow light to clear the grade crossing during train pre-emption, the new technology shuts down all movements at the signal except for the grade crossing approach. The grade crossing approach is given a green light (and protected left-turn arrow, if appropriate) to clear the crossing; hence the term "green clearout."

Detection Requirements

Any improvements to the grade crossings in Scappoose would require that the existing equipment be replaced with new equipment that can provide the green clearout. To provide enough time for the railroad equipment to communicate with the traffic signals, have the traffic signal provide the green clearout, and then have the crossing safely provide the right-of-way to the passing train, a significant amount of track detection must be provided on the railroad. Depending on train speeds, the necessary track detection can extend several hundred feet to either side of the crossing.

Closely spaced crossings can further complicate detection efforts because the detection fields of adjacent crossings can overlap with each other, requiring additional hardware and software modifications and expense.

Vertical Profile Alignment Options

When designing a new grade crossing, design standards are employed to determine safety, operation, and speed characteristics of each roadway approach. The consultant team reviewed three different design standards for each existing crossing: the 1994 AASHTO standard, the 2001 AASHTO standard, and redesign of the crossing maintaining the existing roadway and rail grade. The alternatives are illustrated in Figures 4-1 through 4-8.

The 1994 AASHTO standard states that within 30 feet of the outermost rail, the roadway profile may not exceed 3 inches higher, nor 6 inches lower, than the top of the outermost rail. The 2001 AASHTO standard is stricter as it increases the criterion to not more than 3 inches higher or lower in the 30 feet from the outermost rail . In each alternative, an additional track located 15 feet east of the existing mainline was included in the design analysis to accommodate the potential for a double-track within the corridor. The alternatives also reflect different roadway design speeds to minimize the impacts along Highway 30.

Design Standard Options

Design Option #1 involved raising or lowering the railroad to meet the 2001 AASHTO standards. Even though ODOT's Rail Division has not adopted the 2001 AASHTO standard, it was considered because it generally results in a design that provides enhanced driver comfort levels. A design speed of 25 miles per hour (mph) along the roadway was assumed, which dictates using a vertical rate of change ("K" value) of 12 for a crest curve (essentially a hump in the road) and 26 for a sag curve (a dip in the road). This design speed assumes that vehicular traffic would approach the crossing at the speed limit, then reduce speed to 25 mph as the traffic approaches the grade crossing near the intersection of the roadway and Highway 30.

Design Option #2 entailed raising or lowering Highway 30 to meet the 1994 AASHTO standard. This is the current ODOT standard for any new crossing. To minimize the impact of raising/lowering the roadway profile, the design speed in this alternative was assumed to be 20 mph. Therefore the "K" values were reduced to 7 for a crest curve and 17 for a sag curve. By reducing the design speed, the "K" values could be lowered, which in turn shortened the length of vertical curves.

Design Option #3 incorporated a possible deviation from the design standards to provide an option that strikes a balance between the impacts to Highway 30 and the railroad. The deviations shown involved a redesign of the crossings while maintaining the existing Highway 30 and railroad grades. As such, the deviations would not meet either the 1994 or 2001 AASHTO standards. The minimum AASHTO design speed of 15 mph was assumed and the associated "K" values were 3 for a crest curve and 10 for a sag curve.

It should be recognized that any Design Option #3 configuration would require an application for a deviation (or variance) through ODOT Rail. The design shown is the best that can be developed without substantially raising Highway 30 or lowering the railroad; however, ODOT Rail will have the final authority to approve or refuse any requested design deviation. ODOT Rail does not automatically approve design deviations and would carefully consider any deviation request, paying particular attention to the potential for low-clearance vehicles to bottom out on the crossing. There is no guarantee that any of the conceptual deviations presented in this chapter would be approved by ODOT Rail. Further, ODOT Rail would not review or comment on any such proposal without a complete design application.

Design Vehicle

For each of the crossings, design vehicles have been identified to address the standards to which the crossings would likely be designed. Those design vehicles include: WB-40 (an intermediate semi-tractor/trailer with a 40-foot wheelbase), WB-67 (an interstate semi-tractor/trailer with a 67-foot wheelbase), and SU (single-unit truck).

GRADE CROSSING EVALUATION

As part of the opportunities and constraints assessment, each of the existing grade crossings was evaluated to determine what improvements were necessary and the potential costs associated with those improvements. The following section provides an overview of the improvements necessary at each crossing, the potential for compliance with applicable design standards, and a conceptual cost estimate to improve the crossing.

Havlik Drive

The Havlik Drive private grade crossing is currently located below the grade of Highway 30 and would require improvements to meet AASHTO Design Standards. Figure 4-1 illustrates potential improvement options that are presented in more detail below.

Turning Movements:

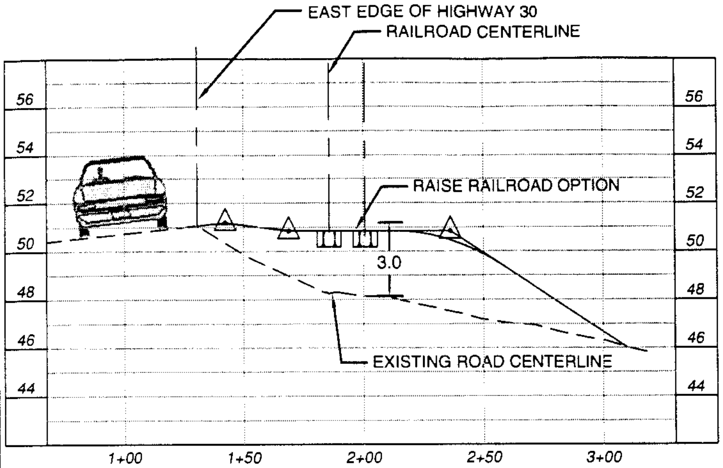
If Havlik Drive was continued east across the PNWR, it would require converting the existing private grade crossing to a public grade crossing. The design should account for a WB-67 turning radii rather than a WB-40 to ensure that highway trucks could maneuver over the crossing to serve potential development on the east side of Highway 30.

Vertical Profile:

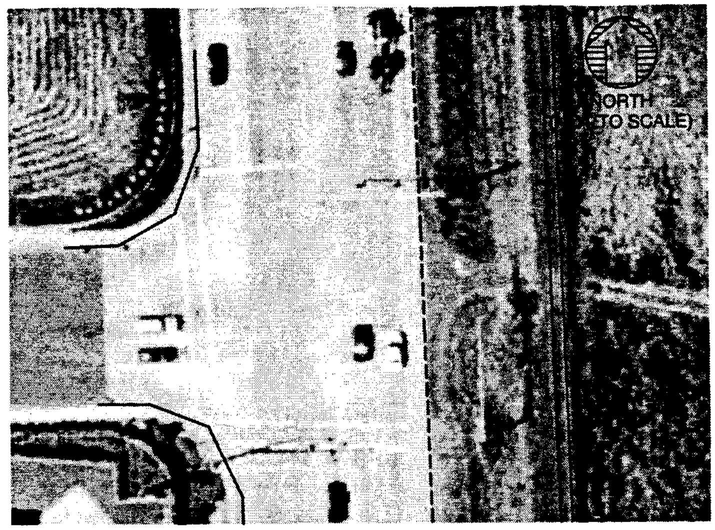
The 2001 AASHTO standard requires raising the railroad profile 2.5 feet from the existing top of rail (or lowering the highway profile 2.5 feet from the edge of pavement) to meet the existing Highway 30 profile. Given the railroad design speed of 40 mph, the raise would begin and end approximately 1,700 feet on each side of the crossing. The estimated cost for this improvement is approximately $1.4 million.

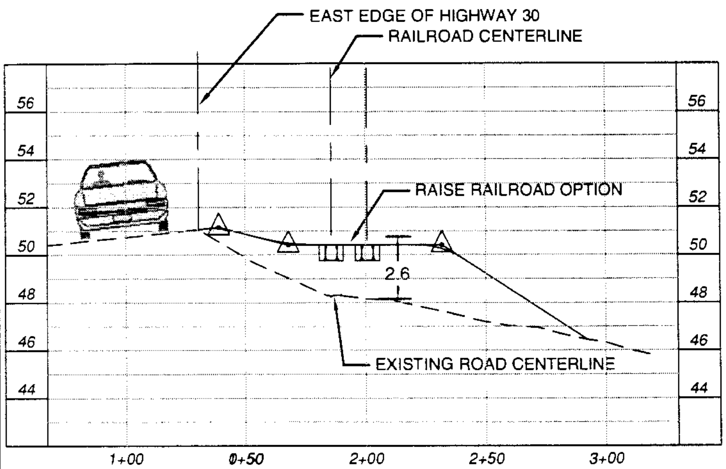
The 1994 AASHTO standard impacts the railroad less, but would still require the railroad to be raised 2 feet. A 2-foot raise at Havlik would require the railroad to raise the approaches to the crossing approximately 1,500 feet on each side of the crossing. The estimated cost for this improvement is also approximately $1.4 million.

Under design Option #3, Havlik Drive is extended across the railroad with no additional construction along Highway 30 or the railroad. The roadway profile deviated from the ODOT standard by approximately 2.4 feet. Sight distance impacts would have to be addressed to ensure that motorists could recognize an oncoming train. Also, the crossing would have to be restricted to non-highway truck traffic. If future development occurs on the east side of the tracks, construction vehicles should be directed to use the crossing at High School Way. The estimated cost of this design is approximately $1.2 million.

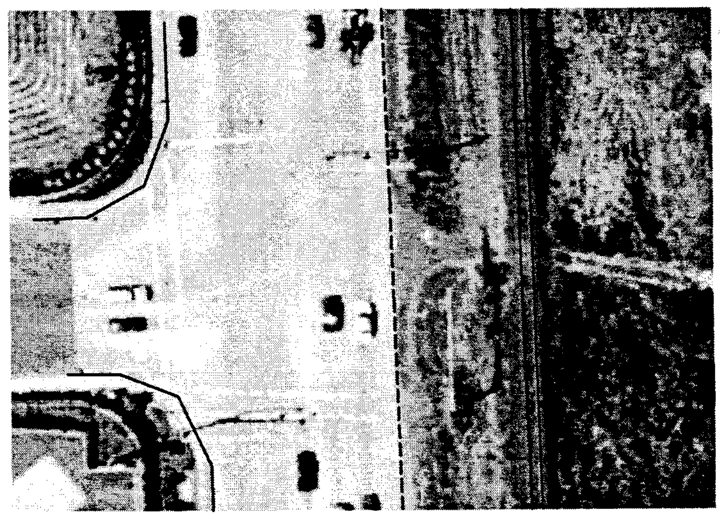


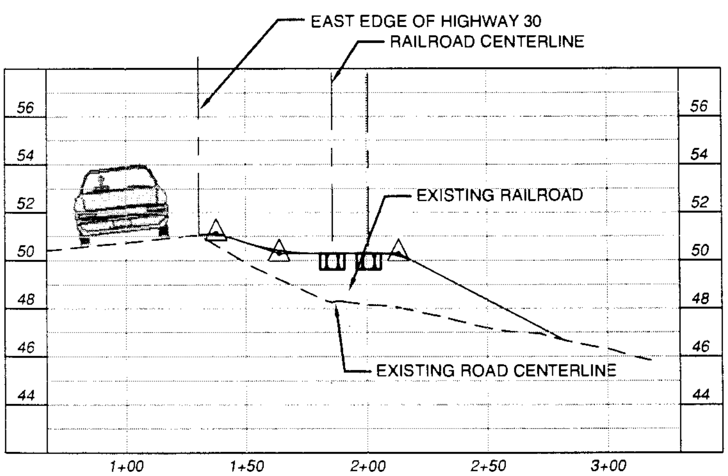
AASHTO 2001



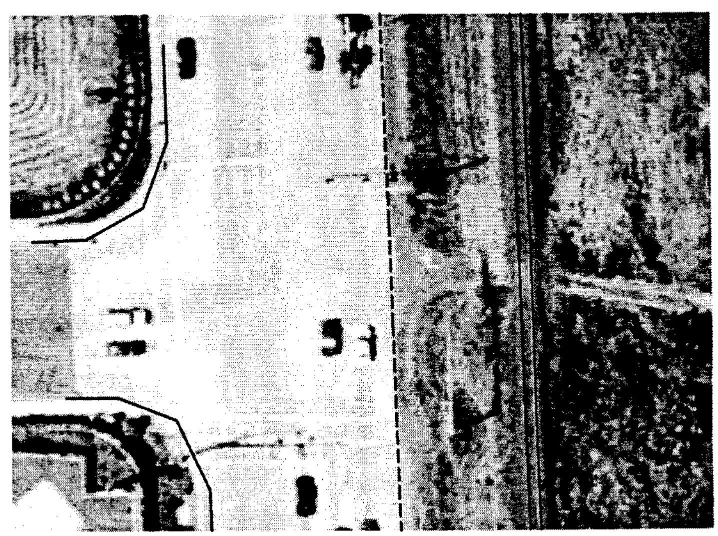


AASHTO 1994





DEVIATION



HAVLIK DRIVE
VERTICAL PROFILE OPTIONS

Scappoose Rail Crossing Corridor Study
Scappoose, Oregon October 2002

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FIGURE 4-1

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High School Way

The existing High School Way public grade crossing is located above the grade of Highway 30 and would require improvements to meet AASHTO Design Standards. Figure 4-2 illustrates potential improvement options that are presented in more detail below.

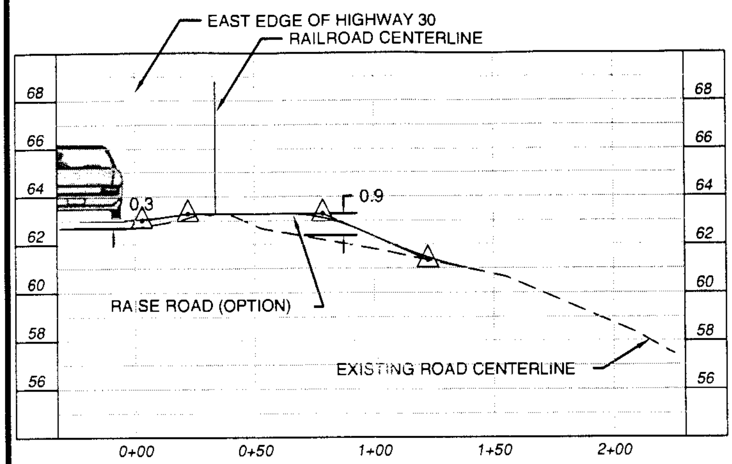
Turning Movements:

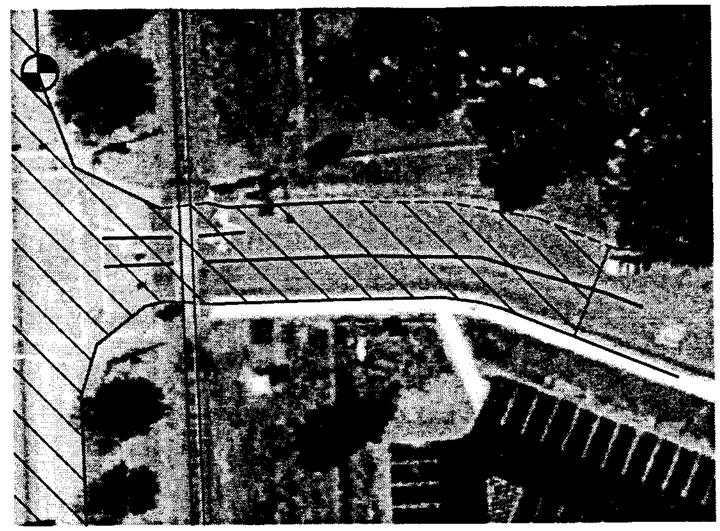
Because High School Way currently does not have a significant amount of truck traffic, a WB-40 truck was assumed to be the maximum size of truck traffic passing over the crossing. The existing turning radius is currently insufficient to accommodate a WB-40 truck movement, and the trucks are currently making wider turns, wither by crossing over the lane lines or by dragging their trailers over the curbs. The existing turning radii would need to be adjusted to accommodate these movements.

Vertical Profile:

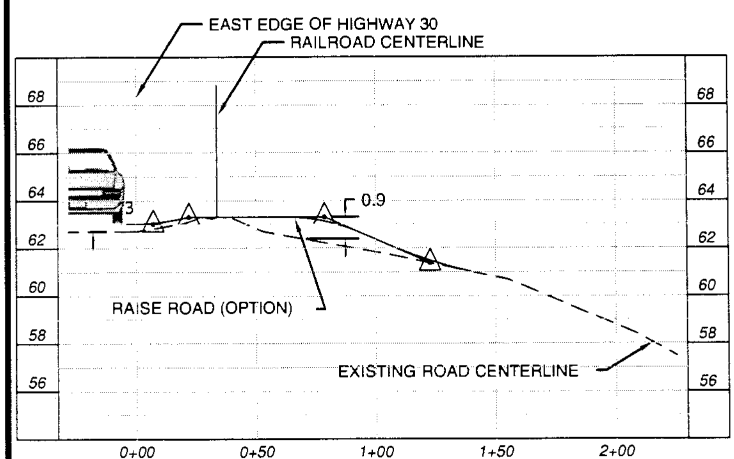
A comparison of the 1994 and 2001 AASHTO standard concluded that the design results are the same. The standards require the vertical profile of Highway 30 to be raised 3 inches and High School Way to be raised 11 inches to the east side of the tracks. (Another solution would be to lower the tracks). Raising High School Way would require the roadway to be reconstructed for approximately 150 feet from the edge of Highway 30. The design results achieved using the 1994 and 2001 standards are the same due to the horizontal distance between the track and edge of pavement on Highway 30. The 150 foot distance dictates the amount of elevation drop that is possible without exceeding a 3-inch drop from the outermost rail at 30 feet. The estimated cost for this improvement is approximately $450,000.

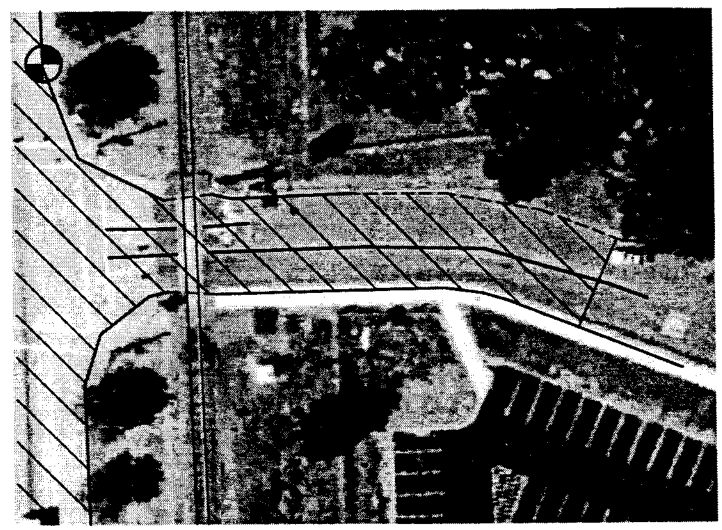
Design Option #3 does not require Highway 30 to be raised, but still requires the 11-inch raise on the east side to accommodate the additional mainline track. The area of reconstruction along the roadway would be approximately 110 feet from the edge of Highway 30. The estimated cost for this improvement is approximately $330,000.



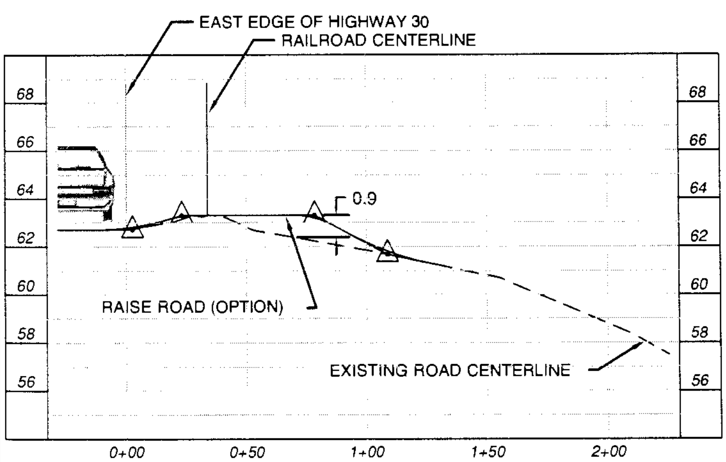


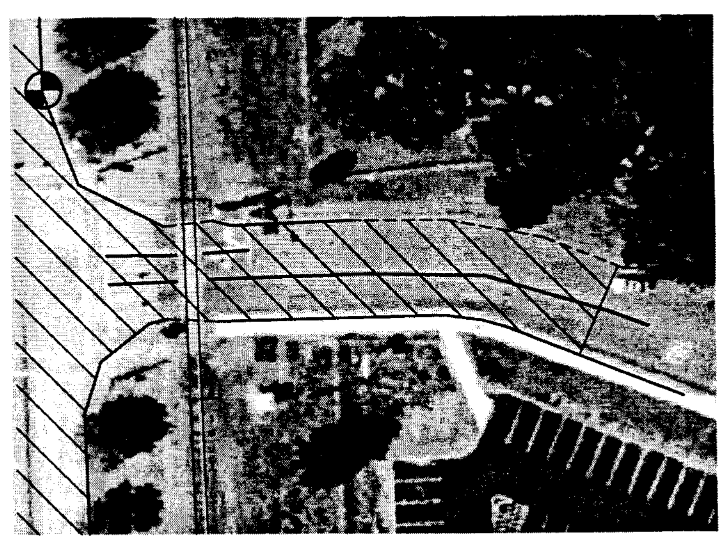
AASHTO 2001





AASHTO 1994





DEVIATION

HIGH SCHOOL WAY
VERTICAL PROFILE OPTIONS

Scappoose Rail Crossing Corridor Study
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HDR

FIGURE 4-2

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Santosh Street, Maple Street, and Columbia Avenue

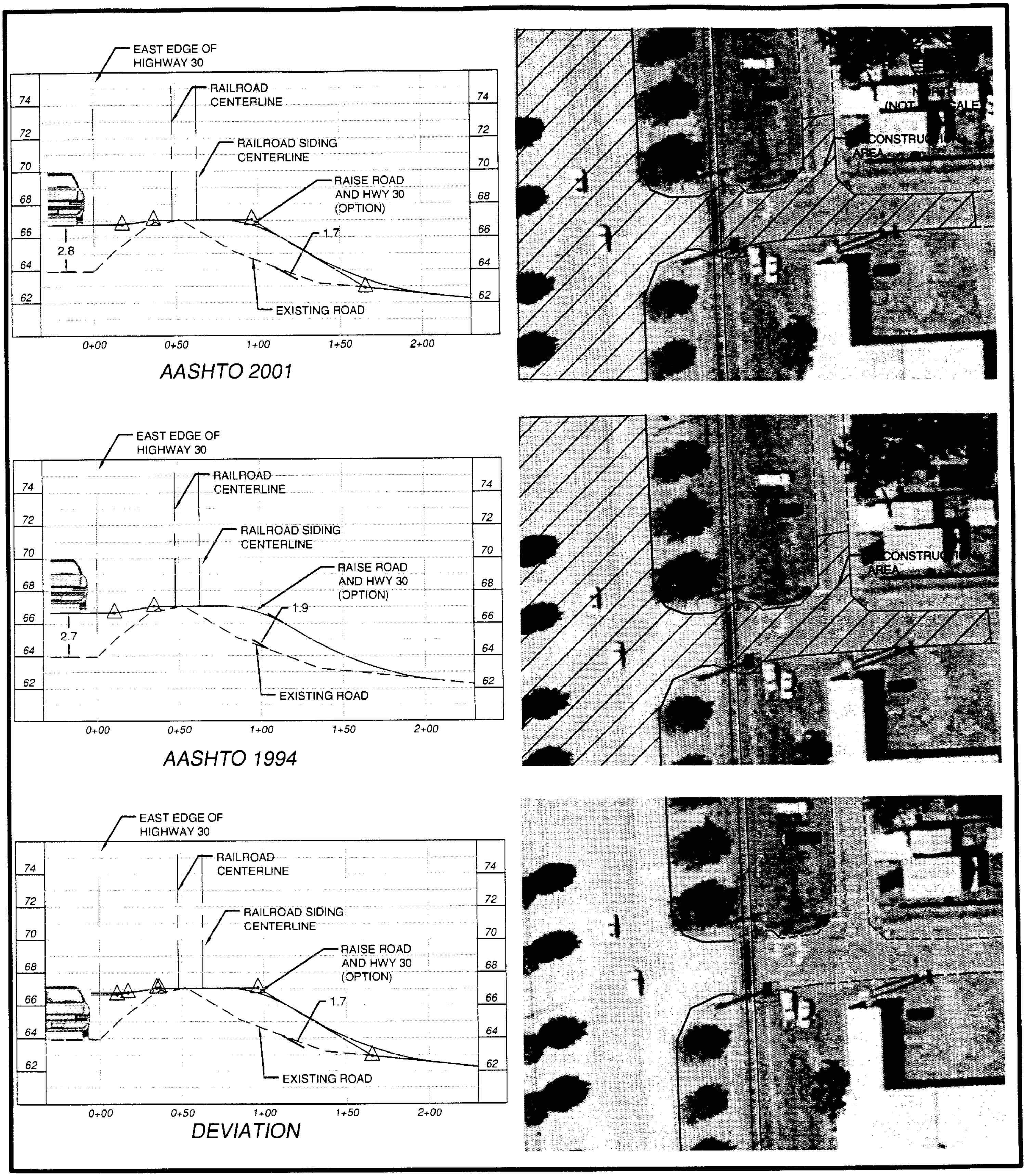
The Santosh Street, Maple Street, and Columbia Avenue grade crossings were evaluated as a group. Each of these public crossings is located above the Highway 30 grade. Further, any change to the rail grade at an individual crossing would require changes to all three crossings. Figures 4-3 through 4-5 illustrate the improvements considered at the individual crossings as discussed below.

Vertical Profile:

Adopting the 1994 or 2001 AASHTO standards would severely impact each of these three roadway approaches to Highway 30 and the highway itself. Each crossing would require a raise of approximately 2.1 feet above the existing elevation. These three roadways would have to be rebuilt for at least the first 200 feet east from the edge of pavement of Highway 30. The reconstruction east of the crossing would also affect the streets that intersect Santosh Street, Maple Street, and Columbia Avenue within the 200-foot construction influence area (e.g., NE 1st Street).

In addition, an existing siding running through Columbia Avenue would need to be raised 2 inches from its current top of rail elevation. The railroad would have to raise and surface the track several hundred feet on each side of the road crossings to accomplish the raise.

Design Option #3 had severe impacts on Highway 30, raising it approximately 1.5 feet above the existing elevation. At 30 feet from the outermost rail on the west side of the crossing, the roadway was 6 inches lower than the plane of the rails. Columbia Avenue would have to be rebuilt 130 feet east from the edge of pavement of Highway 30 and the reconstruction would affect 200 feet of additional roadway. The estimated cost for this improvement is approximately $400,000.



SANTOSH STREET VERTICAL PROFILE OPTIONS

Scappoose Rail Crossing Corridor Study
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FIGURE 4-3

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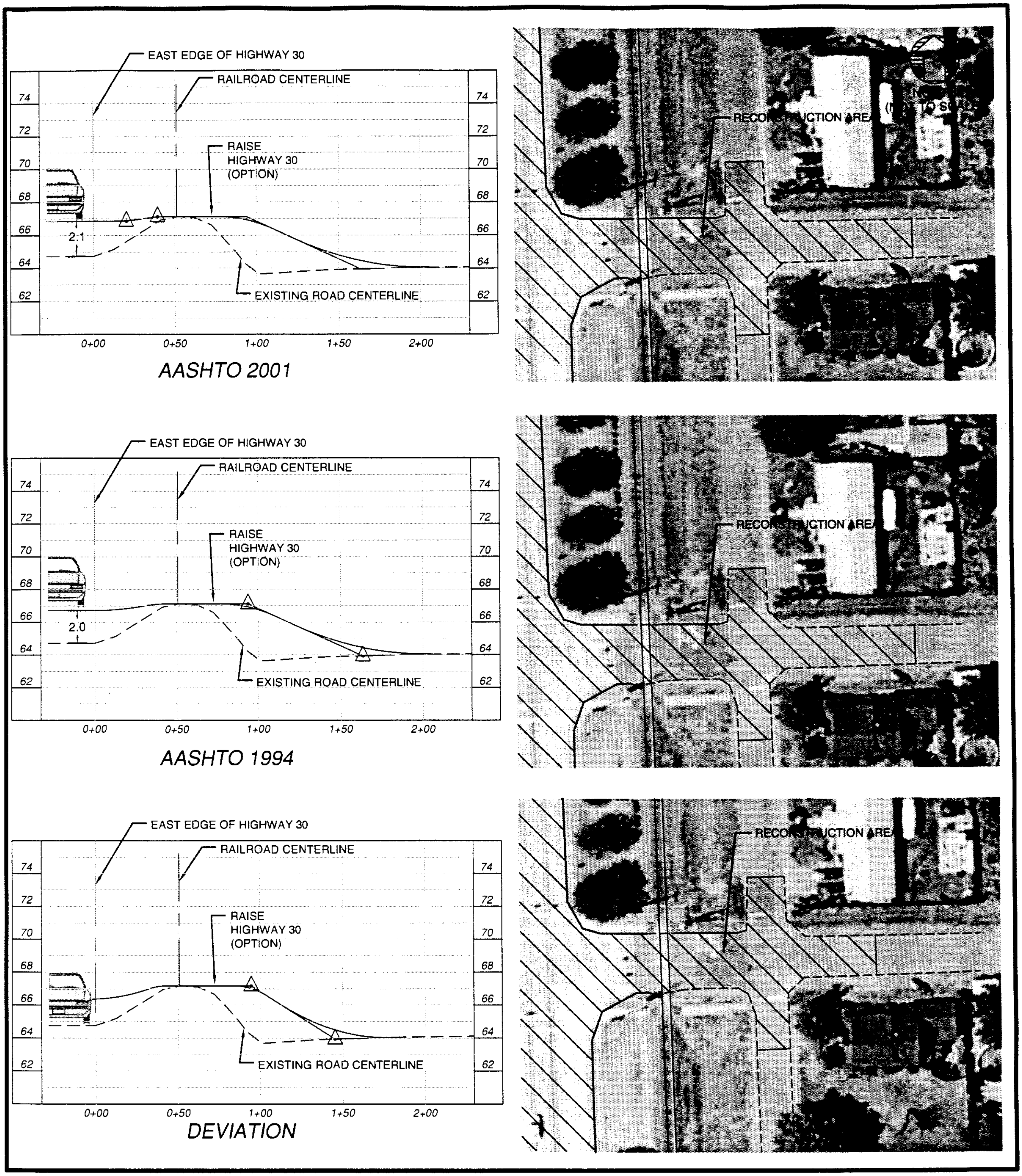

MAPLE STREET
VERTICAL PROFILE OPTIONS

Scappoose Rail Crossing Corridor Study
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FIGURE 4-4

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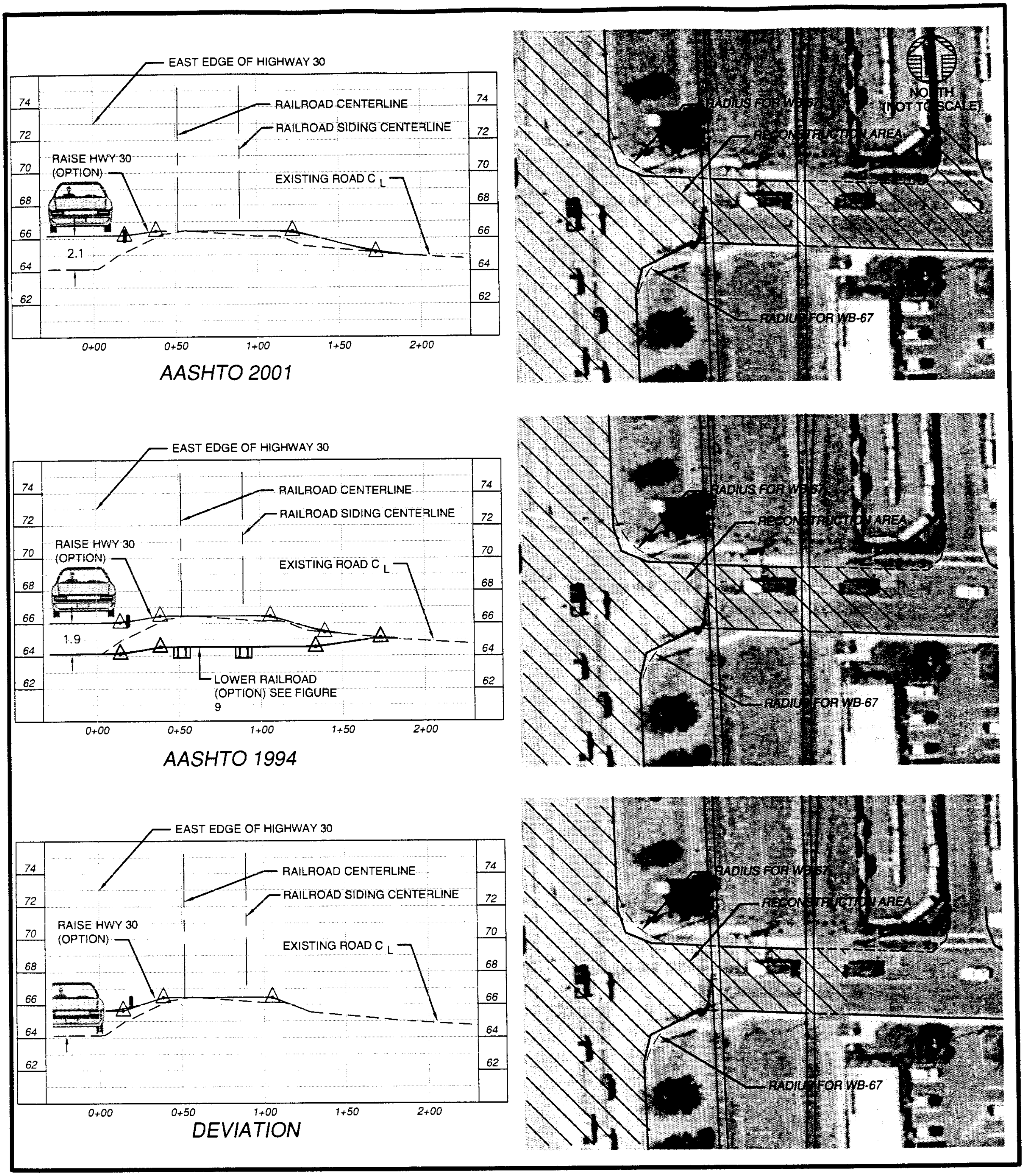

COLUMBIA AVENUE
VERTICAL PROFILE OPTIONS

Scappoose Rail Crossing Corridor Study
Scappoose, Oregon — October 2002

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FIGURE 4-5

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Williams Street

The William Street crossing is one of the few crossings in the rail corridor that currently meets AASHTO Design Standards. Figure 4-6 illustrates potential improvement options that are presented in more detail below.

Turning Movements:

At the time this report was prepared, Williams Street could accommodate the turning movements of a WB-40 design vehicle, but would need to be reconstructed to accommodate a WB-67 design vehicle.

Vertical Profile:

The impacts to Williams Street were minimal when applying the 2001 AASHTO standard. There were no impacts to Highway 30 or the railroad, but the Williams Street roadway approaches would need 150 feet of reconstruction (with the majority on the east side of the tracks). When applying the 1994 AASHTO standard, the impacts were slightly better. There were no impacts to Highway 30 or the railroad, and the roadway approaches would only have to be adjusted for approximately 25 feet from the centerline of the outer track. The estimated cost for this improvement is approximately $320,000.

Since the design standards can be met, there would be no need to seek a deviation and. As a result, Design Option #3 was not applicable.

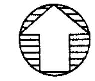
Crown-Zellerbach Logging Road

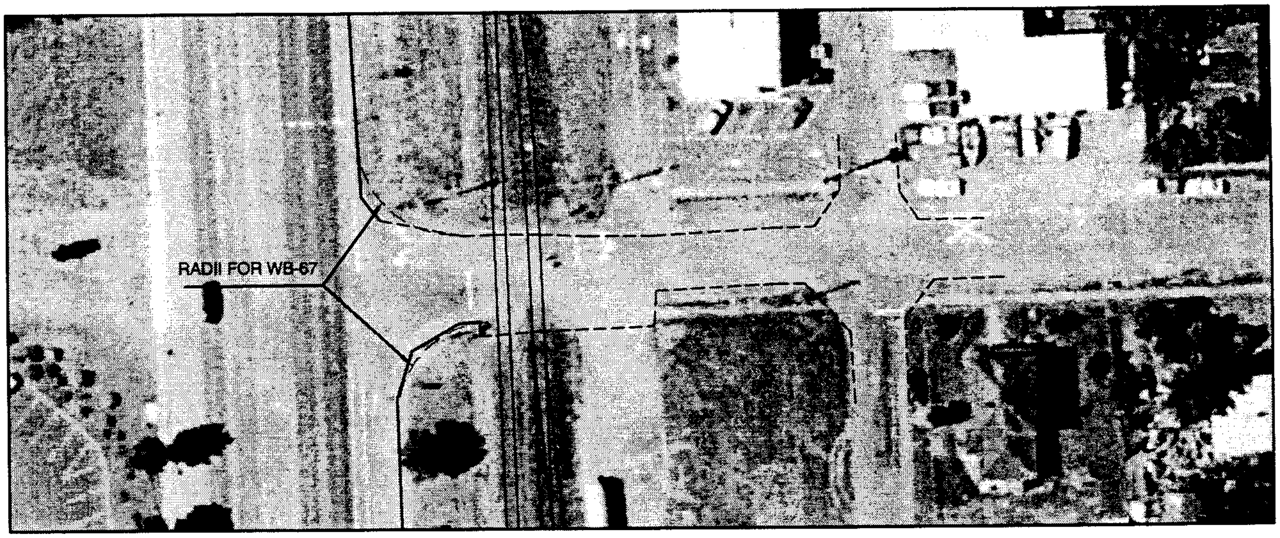
The existing Crown-Zellerbach Logging Road crossing is located at a higher grade than Highway 30. Figure 4-7 illustrates potential improvement options that were considered to reduce the grade difference and improve the crossing.

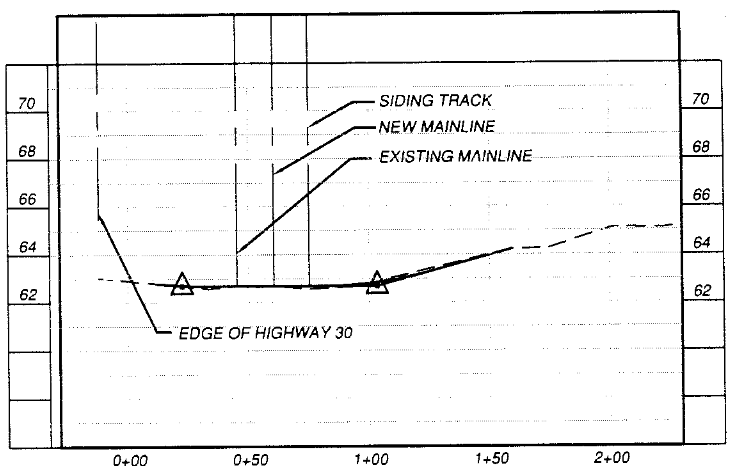
Vertical Profile:

Crown-Zellerbach Logging Road is similar to Santosh Street, Maple Street, and Columbia Avenue in that the AASHTO Standards cause significant impacts to Highway 30. In conjunction with the current OTIA project to improve Crown-Zellerbach Logging Road to a public roadway, the vertical profile between Highway 30 and the railroad would need to be addressed.

The roadway profile deviates from standard by 1.2 feet. The crossing is heavily used by truck traffic and there are indications that trucks have high-centered on the asphalt approaches. The planned westbound roadway approach is a long tangent designed for 25 mph; however, if the vertical profile is not addressed the crossing would have to be restricted to a speed of 5 mph.







EXISTING GROUND

NOTE:
WILLIAMS MEETS VERTICAL DESIGN CRITERIA

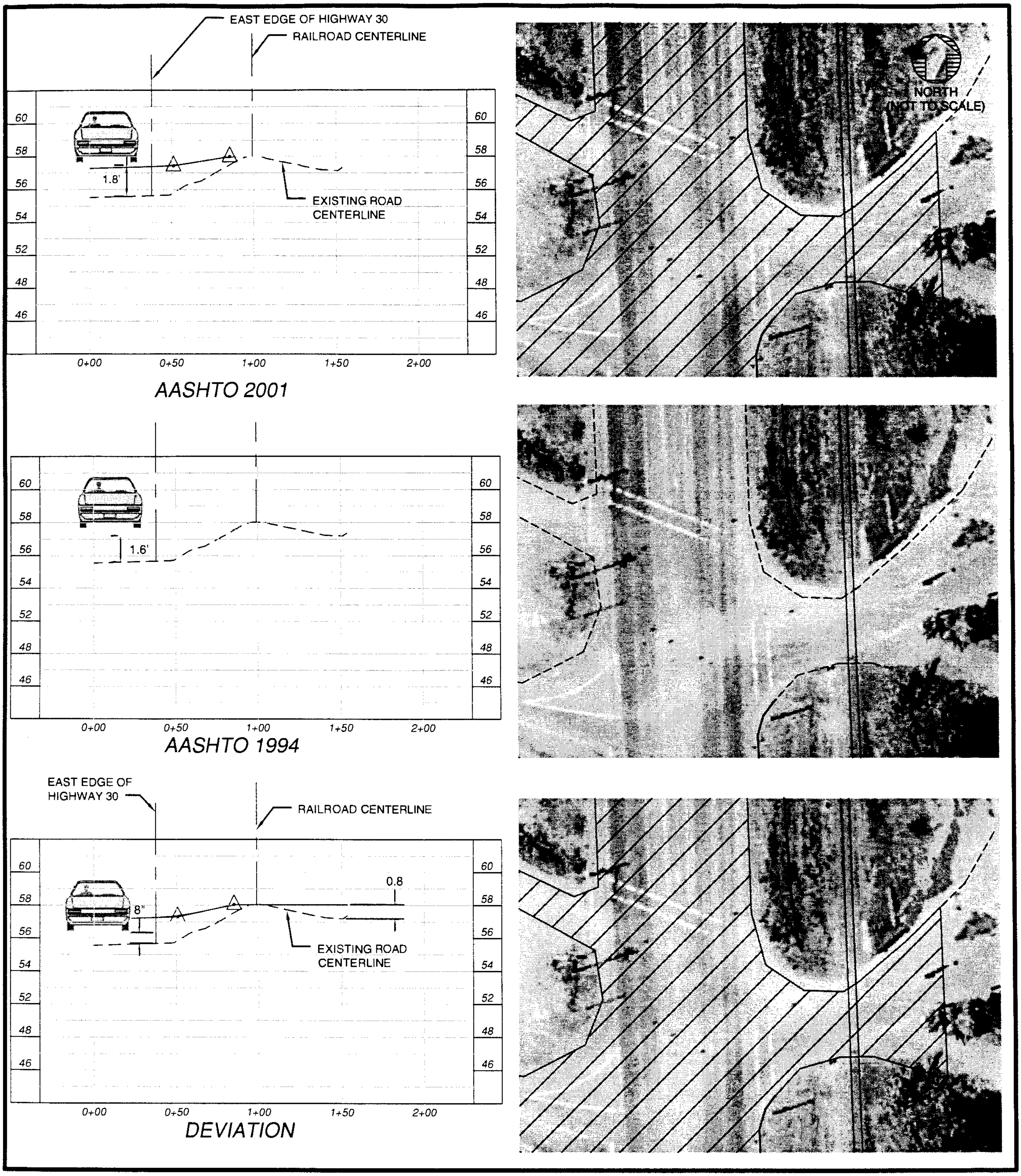
WILLIAMS STREET VERTICAL PROFILE OPTIONS

Scappoose Rail Crossing Corridor Study
Scappoose, Oregon
October 2002

HDR

FIGURE 4-6

5225\DWGS\FINAL REPORT\5225F406



ZELLERBACH LOGGING ROAD VERTICAL PROFILE OPTIONS

Scappoose Rail Crossing Corridor Study

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FIGURE 4-7

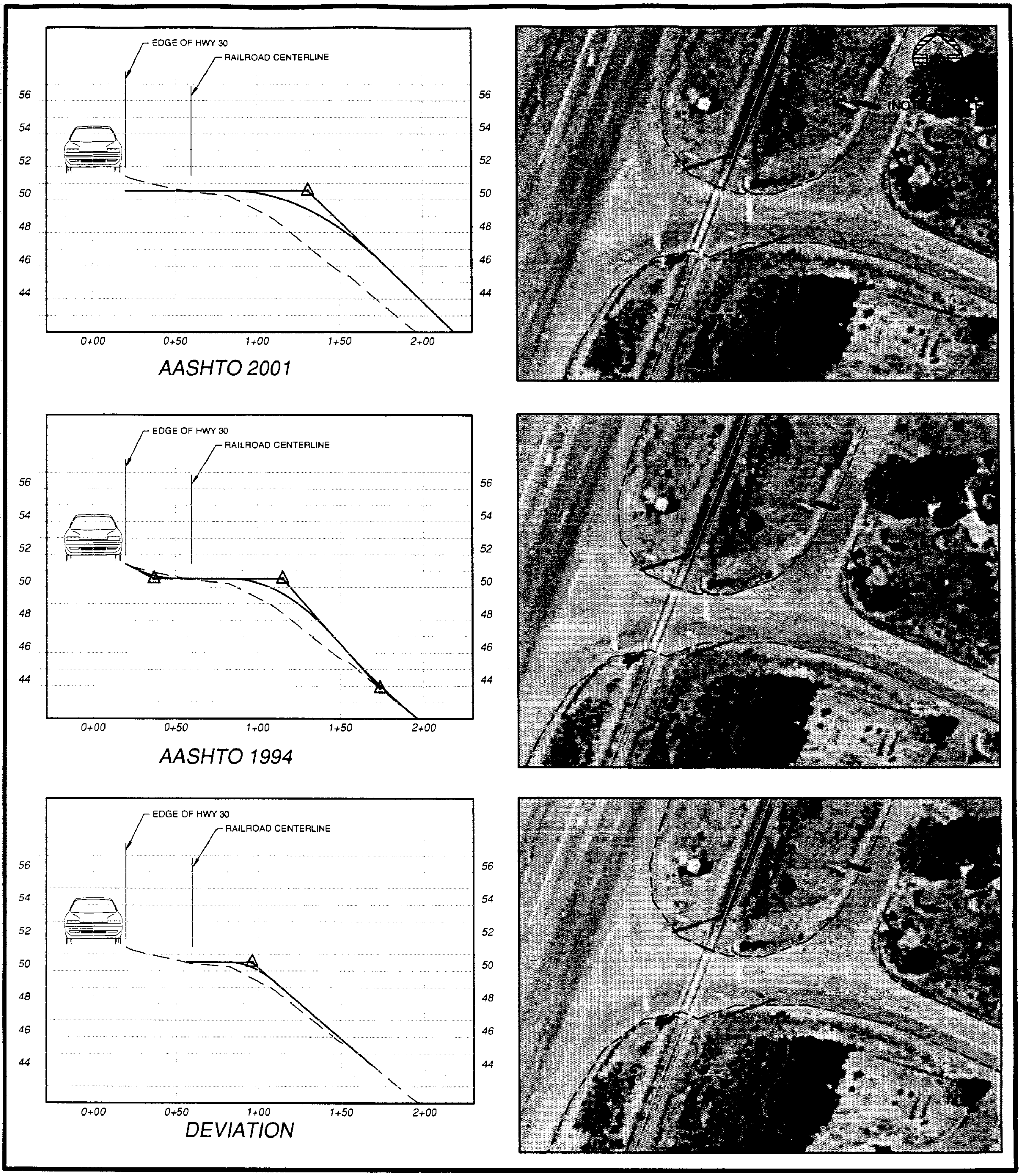
5225\DWGS\FINAL REPORT\5225F407

At the time this report was prepared, ODOT had a funded project to overlay Highway 30. This project was thought to present an opportunity to raise Highway 30 and improve the profile of Crown-Zellerbach Logging Road. To meet the railroad profile without affecting the design speed of the roadway, Highway 30 would need to be raised and reconstructed for approximately 1,800 feet. The estimated cost for this improvement is approximately $2.1 million (assuming ODOT funds the additional pavement raise as part of the overlay project).

West Lane Road

The current West Lane Road grade crossing would not require as substantial a reconstruction effort compared to other crossings along the study corridor. Figure 4-8 presents potential improvement options.

Design Option #3 uses the existing roadway approach west of the railroad, but to accommodate the new mainline track, the roadway approach on the east side of the track would have to be rebuilt for approximately 150 feet from the centerline of the existing mainline track. The estimated cost for this improvement is approximately $500,000.



WEST LANE ROAD VERTICAL PROFILE OPTIONS

Scappoose Rail Crossing Corridor Study
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FIGURE 4-8

5225\DWGS\FINAL REPORT\5225F408

After analyzing each existing crossing, it became apparent that High School Way, Williams Street, and West Lane Road were the only crossings that did not require major reconstruction of Highway 30 or the railroad to meet the design standard. Havlik Drive, Santosh Street, Maple Street, Columbia Avenue, and Crown-Zellerbach Logging Road could not meet the AASHTO standards unless a comprehensive, long-term master plan was implemented to address the elevation difference between the railroad and Highway 30.

Because the streets in this area are very close to each other, raising Highway 30 or lowering the railroad would create a domino affect that would impact streets within the City of Scappoose for approximately 2 miles from Havlik Drive to Crown-Zellerbach Logging Road. To address these impacts, the consultant team reviewed alternatives that would provide a long-term solution that would allow the City of Scappoose to continue to grow and have access across the PNWR while at the same time preserving the integrity and operations of the PNWR.

Corridor Option #3A

Corridor Option #3A raised Highway 30 approximately 2 to 3 feet to match the elevations at each of the crossings. The raise would begin at High School Way and continue 4,500 feet to Crown-Zellerbach Logging Road. If the entire highway were simply raised, the elevation change would affect all property owners and businesses on the west side of Highway 30 for the length of the raise. The raise may require property/business owners to raise their existing buildings/facilities to meet the new roadway or require them to relocate their businesses. Another option would be to super-elevate the east side of Highway 30, creating a continuous downhill slope from east to west. Such a design would affect drainage design and would likely require frontage improvements for existing businesses. An additional engineering study would need to be performed to validate either of the design alternatives.

The estimated cost does not include or address any cost associated with the purchasing of property, relocations, or retrofitting the existing facilities. An order-of-magnitude cost estimate for Corridor Option #3A is approximately $9.7 million.

Advantages:

- Meets AASHTO Design Standards

Disadvantages:

- Adverse right-of-way impacts to properties along Highway 30.

§ Substantial costs to public and private interests, including reconstruction of recently rebuilt segments of Highway 30.

- Detrimental to community livability.
- May require substantial changes to storm drainage system.

Corridor Option #3B

Corridor Option #3B lowered the railroad to match the Highway 30 east edge of pavement profile. This would require reconstructing the railroad 3 feet lower than its existing elevation for approximately 4,500 feet as shown in Figure 4-9. Before the PNWR would consider this alternative, a hydraulic analysis of the area would be required to verify that the new track elevation is not within the 100-year flood plain. The reconstruction would begin south of Havlik Drive and tie back into the existing track elevation near Crown-Zellerbach Logging Road.

Alternatively, the portion of railroad track near Havlik Drive could be raised and the section between High School Way and Columbia Avenue lowered. This "sectional" approach could be completed in several phases or all at once. To lower the railroad without impacting existing railroad operations requires construction of a new track 15 feet east of the existing mainline track at the lowered elevation. The existing ground would have to be excavated and new subgrade established.

The alignment would consist of new track materials meeting mainline track standards. Once the new track was in place the existing mainline track would be shifted onto the new alignment. The existing track could then be removed and graded to meet the roadway elevations and provide sufficient drainage for the track. New roadway approaches then could be constructed meeting either the 1994 or 2001 AASHTO standards.

Alternatively, PNWR staff noted that a temporary "shoofly" track could be constructed to the east of the existing mainline track and train traffic diverted to the shoofly while the existing mainline was reconstructed to the new final grade. Once the new lower mainline is opened, train traffic could be shifted back to the mainline and the shoofly could be removed.

Corridor Option #3B addressed most of the crossings in the downtown area, but due to the close proximity of two bridges just north of Crown-Zellerbach Logging Road, the track cannot be lowered through this section. Consequently, the adjacent portion of Highway 30 would still need to be raised. An order of magnitude cost estimation for Corridor Option #3B is approximately $7.7 million.

Advantages:

- Meets AASHTO Design Standards.
- Minimizes impacts to existing businesses located along Highway 30.
- Minimizes roadway approach reconstruction.

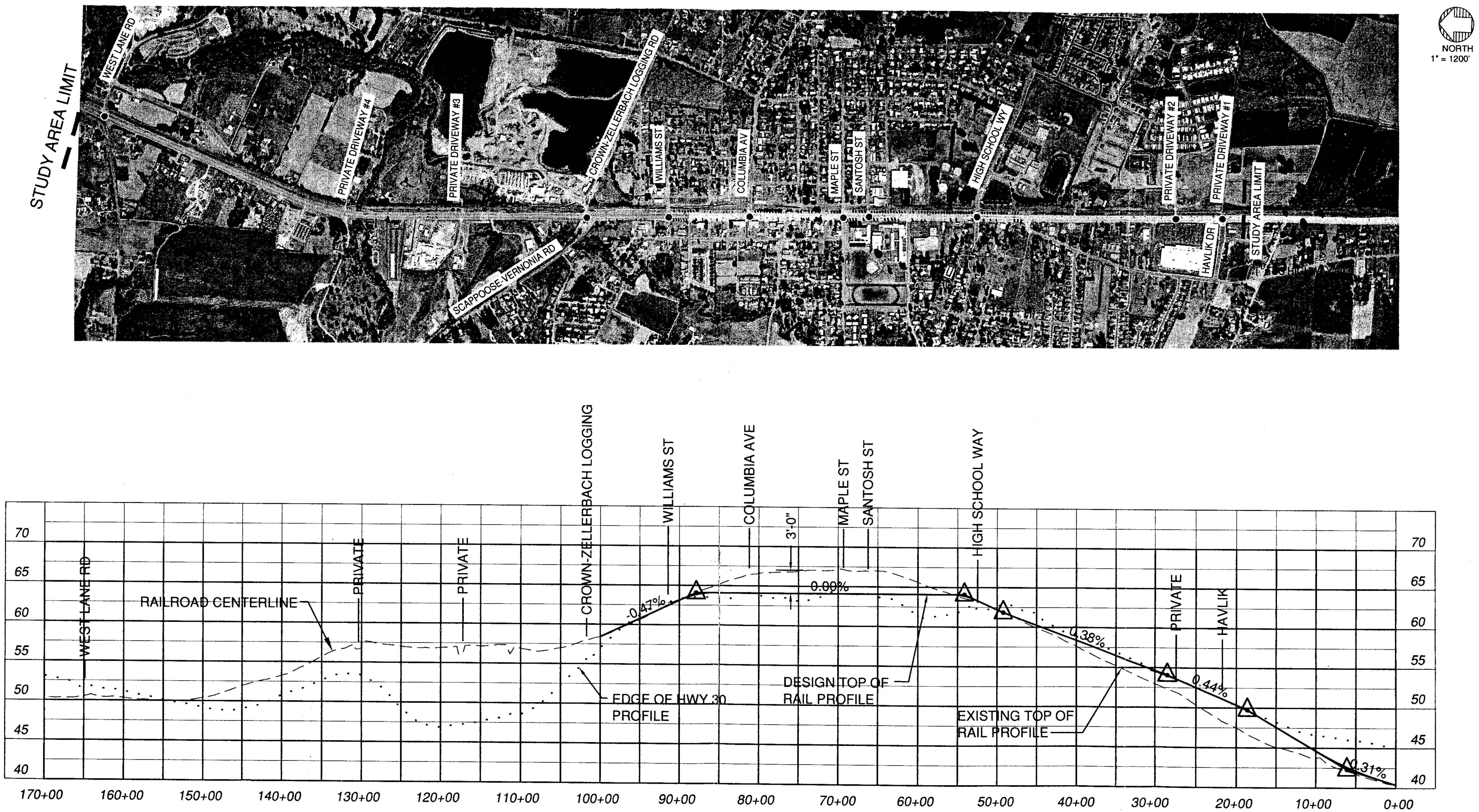
Disadvantages:

- Results in extended closures of the following crossings during construction: Columbia Avenue, Maple Street, and Santosh Street.
- Additional drainage needed for railroad.
- Local Transportation Improvement Projects

LOCAL ACCESS AND CIRCULATION IMPROVEMENTS

The initial phase of the opportunities and constraints assessment focused on determining where the rail corridor could be located and how the grade difference between the PNWR line and Highway 30 could be minimized. There was also the broader need to address local access, circulation, and traffic control improvements. These potential local improvement projects have the potential to impact the ultimate location and configuration of the planned rail crossings and thus are an important component of the overall corridor study.

Potential local improvement alternatives identified through the project are presented in summary form as Alternatives #1 through #16 on the following pages. These alternative summaries capture relevant information for each alternative improvement, including project purpose and description, potential constraints, cost estimate, implementation timeframe, an aerial overview, and future street classification and cross-section geometry (when applicable).



LEGEND

• STUDY INTERSECTION

— — — — STUDY AREA LIMIT

CORRIDOR OPTION #3B
US HIGHWAY 30 AND PNWR
VERTICAL PROFILE REALIGNMENT

Scappoose Rail Crossing Corridor Study
Scappoose, Oregon — October 2002

FIGURE 4-9

5225\DWGS\FINAL REPORT\5225F409

Alt #1	Havlik Drive Extension

Purpose:

- Provide enhanced connectivity between Highway 30 and the residential area east of the railroad tracks.
- Reduce the reliance on Highway 30 to accommodate local trips.
- Redistribute traffic that would otherwise use High School Way.
- Facilitate further development of the grid street network in southeast Scappoose.
- Provide non-highway access to properties with rail frontage between High School Way and Havlik Drive.

Project Description:

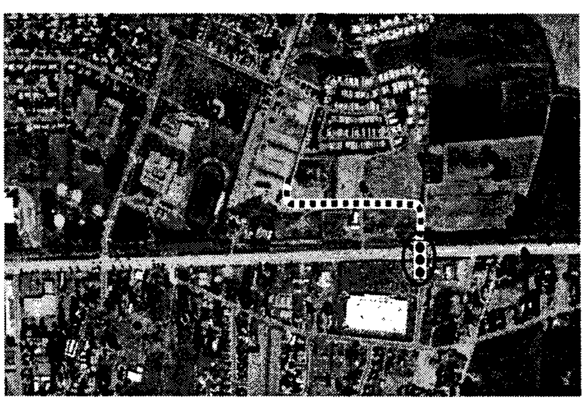
- This project was identified in the City's adopted TSP.
- Creates an east approach to the existing Highway 30/Havlik Drive intersection.
- Creates a new *Major Collector* street between Highway 30 and Fredrick Street.
- Converts the private rail crossing on the east approach to the Highway 30/Havlik Drive intersection to a signalized, public rail crossing.
- Enables the potential closure of the adjacent private rail crossing to the north, which serves the Fountains Galore & More/Time & Time Again (Candle Factory) properties.

Constraints:

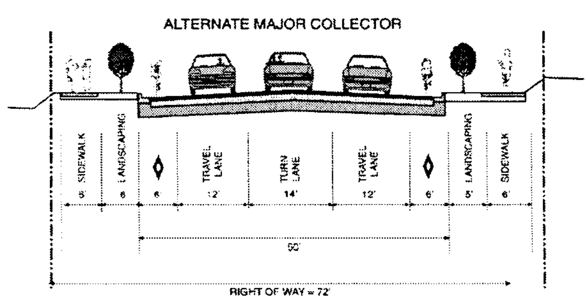
- Results in a new public grade crossing of the Portland and Western Railroad (PNWR).
- Requires modification of the existing Highway 30/Havlik Road traffic signal.
- Existing rail crossing does not meet 1994 AASHTO design standards.
- The difference in elevation between Highway 30 and the railroad may require low clearance vehicles to use the High School Way crossing.

Conceptual Cost Estimate:	$1.5 Million	**Implementation Time Frame:**	Near-term

Project Plan View:



Typical Roadway Cross-Section:



Alt #2	Frederick Street Extension

Purpose:

- Provide enhanced connectivity between Highway 30 and the residential area east of the railroad tracks.
- Reduce the reliance on Highway 30 to accommodate local trips.
- Redistribute traffic that would otherwise use High School Way.
- Facilitate further development of the grid street network in southeast Scappoose.
- Provide non-highway access to properties with rail frontage between High School Way and Havlik Drive.
- "T"-intersection simplifies traffic signal operations, reduces delay compared to four-leg intersection.

Project Description:

- Extends Frederick Street west to Highway 30.
- Creates a new Highway 30/Frederick Street signalized intersection.
- Creates a new signalized, public rail crossing on the east approach to the Highway 30/Frederick Street intersection.
- Enables the potential closure of the adjacent private rail crossing to the south, which serves the Fountains Galore & More/Time & Time Again (Candle Factory) properties.

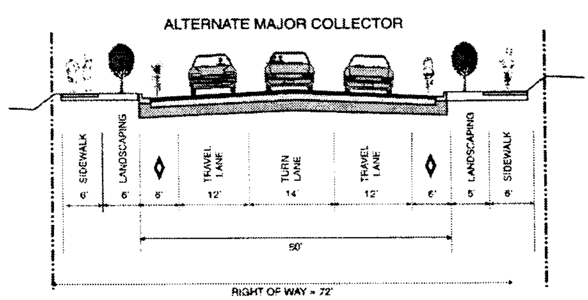
Constraints:

- Results in a new public grade crossing of PNWR.
- Requires construction of a new traffic signal on Highway 30.
- Location of the new traffic signal would likely impact the location and number of existing/potential driveways on the west side of Highway 30.
- The difference in elevation between Highway 30 and the railroad may require low clearance vehicles to use the High School Way crossing.

Conceptual Cost Estimate:	$1.2 Million	**Implementation Time Frame:**	Near-term

Project Plan View:

Typical Roadway Cross-Section:



Alt #3	Old Portland Road Realignment

Purpose:

- Improve motorist safety.
- Provide enhanced connectivity between High School Way and Havlik Drive west of Highway 30.
- Reduce the reliance on Highway 30 to accommodate local trips.
- Facilitate further development of the grid street network in southwest Scappoose.

Project Description:

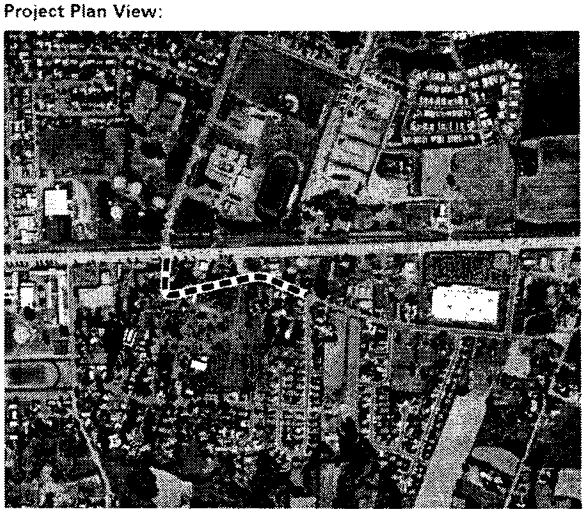
- This project was identified in the City's adopted TSP.
- Realigns the north end of Old Portland Road to connect with Highway 30 via Walnut Street.
- Provides signalized access to and from Old Portland Road via the Highway 30/High School Way intersection.
- Closes the existing unsignalized Highway 30/Old Portland Road intersection.

Constraints:

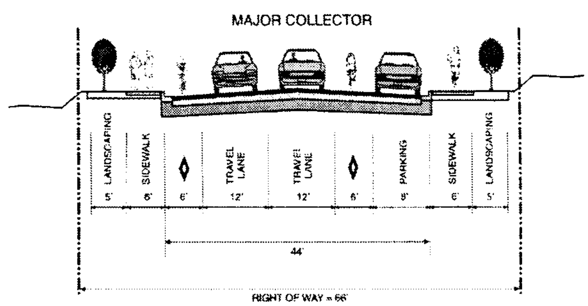
- Requires right-of-way acquisition.
- Will necessitate capacity improvements to the Highway 30/High School Way traffic signal due to increased traffic loading.

Conceptual Cost Estimate:	$615,000	**Implementation Time Frame:**	Near-term

Project Plan View:



Typical Roadway Cross-Section:



* The west approach to Highway 30/Old Portland Road intersection would likely be developed as a 3-lane cross-section with a separate left-turn lane provided at the traffic signal.

Alt #4	High School Way Crossing Closure

Purpose:

- Eliminate the use of High School Way as a through travel route between Highway 30 and 6th Street.
- Enhance pedestrian safety along High School Way by reducing the number of potential pedestrian/vehicular interactions.
- Reduce turning movement conflicts along Highway 30.

Project Description:

- Creates a mid-block barrier on High School Way between Highway 30 and 5th Street restricting the use of High School Way to school related traffic only.
- Enables the development of a non-vehicular environment between the high school and the adjacent ball fields.
- Needs to be implemented in conjunction with provision of alternative access to the residential area east and south of the school (refer to Alternatives #1 or #2).

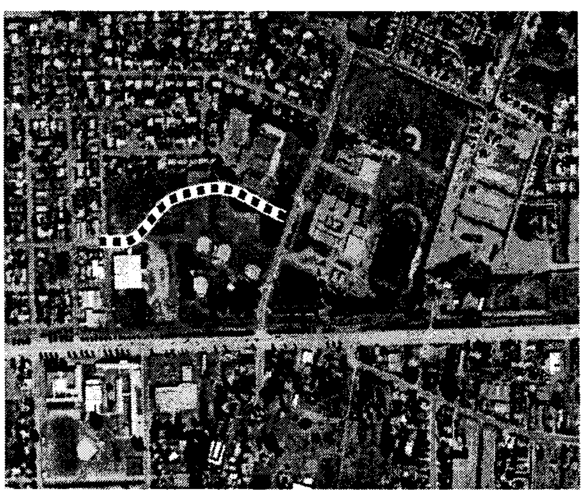
Constraints:

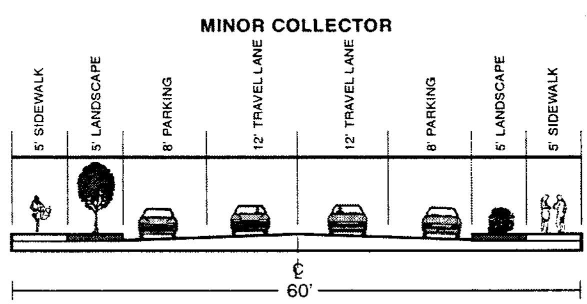
- Requires a public street closure.
- Results in the loss of local street connectivity.
- May require out-of-direction travel for non-school related traffic.
- May necessitate capacity improvements to other Highway 30 intersections.
- May hinder emergency access/response.

Conceptual Cost Estimate:	$20,000	Implementation Time Frame:	Near-term

Project Plan View:

Alt #5	Third Street Extension		
Purpose: • Provide enhanced connectivity between High School Way and Elm Street east of Highway 30. • Improve north-south circulation east of Highway 30. • Provide alternative local access to the Scappoose High School. • Redistribute traffic that would otherwise use 5th Street, 6th Street, and Highway 30. • Reduce the reliance on Highway 30 to accommodate local trips.			
Project Description: • Extends 3rd Street south from Elm Street to High School Way. • The new roadway alignment traverses the former Steinfeld's factory property and could be incorporated as infrastructure to support site redevelopment. • Complements the potential E.M. Watts Road Extension (refer to Alternative #6). •			
Constraints: • Requires right-of-way acquisition. • Creates a new intersection along High School Way in the vicinity of the high school.			
Conceptual Cost Estimate:	$550,000	**Implementation Time Frame:**	With Redevelopment
Project Plan View:		**Typical Roadway Cross-Section:**	





Alt #6	E.M. Watts Road Extension

Purpose:

- Provide enhanced connectivity between Highway 30 and the residential area east of the railroad tracks.
- Reduce the reliance on Highway 30 to accommodate local trips.
- Redistribute traffic that would otherwise use Santosh Street or Maple Street.
- Improve east-west circulation within the City of Scappoose.

Project Description:

- Develop in coordination with the Santosh Street Crossing Closure (refer to Alternative #7).
- Extends E.M. Watts Road east from Highway 30 to Elm Street (just west of 3rd Place).
- Creates an east approach to the existing Highway 30/E.M. Watts Road intersection.
- Creates a new signalized, public rail crossing on the east approach to the Highway 30/E.M. Watts Road intersection.
- The new roadway alignment traverses the former Steinfeld's factory property and could be incorporated the 3rd Street Extension (refer to Alternative #5) as infrastructure to support site redevelopment.

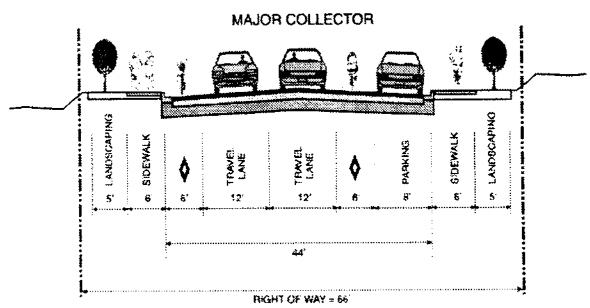
Constraints:

- Results in a new public grade crossing of PNWR.
- Requires modification of the existing Highway 30/E.M. Watts Road traffic signal.
- The difference in elevation between Highway 30 and the railroad may require low clearance vehicles to use the High School Way crossing.
- Requires right-of-way acquisition.

Conceptual Cost Estimate:	$1.5 Million	**Implementation Time Frame:**	With Redevelopment

Project Plan View:

Typical Roadway Cross-Section:



* The east approach to Highway 30/E.M. Watts Road intersection would likely be developed as a 3-lane cross-section with a separate left-turn lane provided at the traffic signal.

Alt #7	Santosh Street Crossing Closure

Purpose:

- Eliminate the unsignalized highway/railroad grade crossing at Santosh Street.
- Reduce the number of existing closely spaced intersections along Highway 30 within the study corridor.
- Reduce turning movement conflicts along Highway 30.

Project Description:

- Terminates Santosh Street just east of the PNWR.
- Closes the existing unsignalized Highway 30/Santosh Street intersection.
- Closes the existing public rail crossing on the east approach to the Highway 30/Santosh Street intersection.

Constraints:

- Requires a public street closure.
- Slightly reduces local street connectivity.
- May necessitate capacity improvements to other Highway 30 intersections.

Conceptual Cost Estimate:	$30,000	Implementation Time Frame:	With Redevelopment

Project Plan View:

Alt #8	Maple Street Crossing Closure

Purpose:

- Eliminate the signalized highway/railroad grade crossing at Maple Street.
- Reduce the number of existing closely spaced intersections along Highway 30 within the study corridor.
- Reduce turning movement conflicts along Highway 30.

Project Description:

- Terminates Maple Street just east of the PNWR.
- Eliminates the east approach to existing signalized Highway 30/Maple Street intersection.
- Closes the public rail crossing on the east approach to the Highway 30/Maple Street intersection.

Constraints:

- Requires modification of the existing Highway 30/Maple Street traffic signal.
- Requires a public street closure.
- May impact pedestrian movements between neighborhood and middle school.
- Results in the loss of local street connectivity.
- Will necessitate capacity improvements to other Highway 30 intersections and/or the development of alternative access to the residential area east of Highway 30 (refer to Alternative #6).

Conceptual Cost Estimate:	$100,000	Implementation Time Frame:	Long-Term

Project Plan View:

Alt #9A	Highway 30/Columbia Avenue Intersection Improvements – Option A

Purpose:

- Facilitate further development of the grid street network in northwest Scappoose.
- Provide alternate signalized access to Highway 30 for properties in the vicinity located on the west of Highway 30 (e.g., the post office).
- Improve east-west circulation within the City of Scappoose.

Project Description:

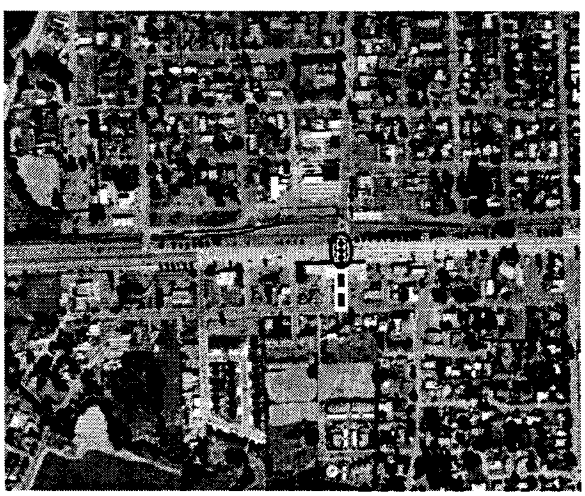
- This project was identified in the City's adopted TSP.
- Converts the west approach of the Highway 30/Columbia Avenue signalized intersection from one-way operations (westbound only) to two-way operations.

Constraints:

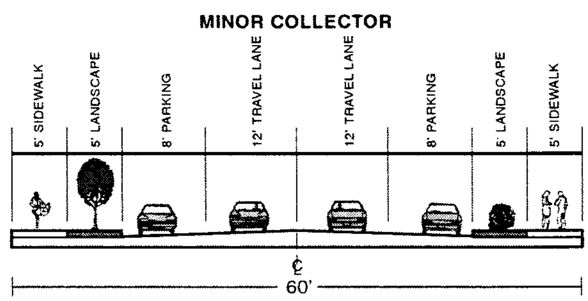
- Requires modification of the existing Highway 30/Columbia Avenue signalized intersection.
- May result in the loss of on-street parking on the west approach to the Highway 30/Columbia Avenue intersection.
- May require relocation of existing businesses.
- Requires right-of-way acquisition or necessitates the realignment of the east approach to the Highway 30/Columbia Avenue intersection.
- Existing rail crossing does not meet 1994 AASHTO design standards.

Conceptual Cost Estimate:	$100,000	Implementation Time Frame:	Long-term

Project Plan View:



Typical Roadway Cross-Section:



Right-of-way constraints may restrict the ability to develop a full Minor Collector street cross-section.

Alt #9B	Highway 30/Columbia Avenue Intersection Improvements – Option B

Purpose:

- Reduce turning movement conflicts along Highway 30.
- Mitigate the offset alignment of Columbia Avenue as it traverses Highway 30.
- Minimize right-of-way impacts to the properties surrounding the Highway 30/Columbia Avenue intersection.

Project Description:

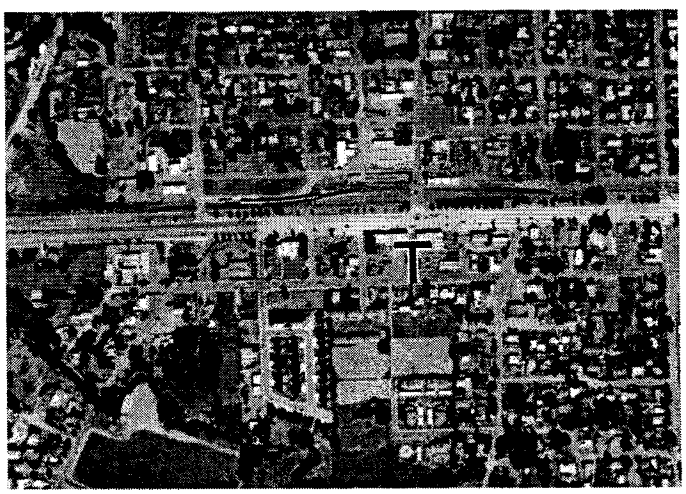
- Closes the west approach of the Highway 30/Columbia Avenue signalized intersection.
- Enables the development of enhanced pedestrian or parking infrastructure in the vicinity.

Constraints:

- Requires modification of the existing Highway 30/Columbia Avenue signalized intersection.
- Necessitates the development of improved alternate signalized access the properties west of Highway 30 (e.g., Alternative #10).

Conceptual Cost Estimate:	$20,000	Implementation Time Frame:	Long-term

Project Plan View:



Alt #10 — **Highway 30/Williams Street Intersection Improvements**

Purpose:

- Facilitate further development of the grid street network in northwest Scappoose.
- Provide alternate signalized access to Highway 30 for properties in the vicinity located on the west of Highway 30 (e.g., the post office).
- Improve east-west circulation within the City of Scappoose.
- Reduce the reliance on Highway 30 to accommodate local trips.
- Redistribute traffic that would otherwise use Columbia Avenue.

Project Description:

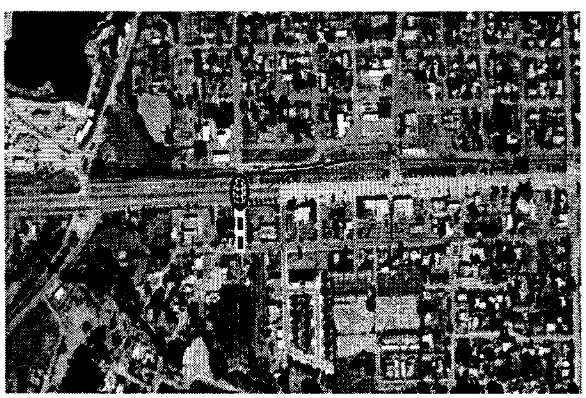
- This project was identified in the City's adopted TSP.
- Creates a westbound approach to the existing Highway 30/Williams Street intersection.
- Signalizes the existing Highway 30/Williams Street unsignalized intersection.
- Creates a new Minor Collector street between Highway 30 and 1st Street.

Constraints:

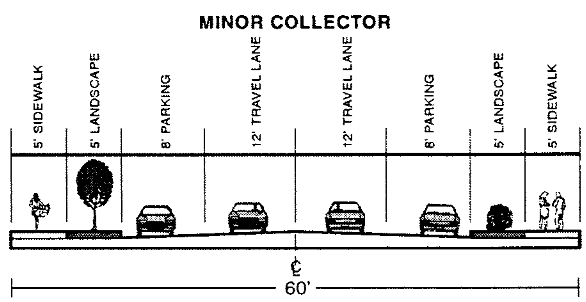
- Requires construction of a new traffic signal on Highway 30.
- Requires right-of-way acquisition.
- Will likely require elimination of fire signal and the reconfiguration of the fire department access to Highway 30.

Conceptual Cost Estimate:	$500,000	Implementation Time Frame:	Long-term

Project plan view:



Typical Roadway Cross-Section:

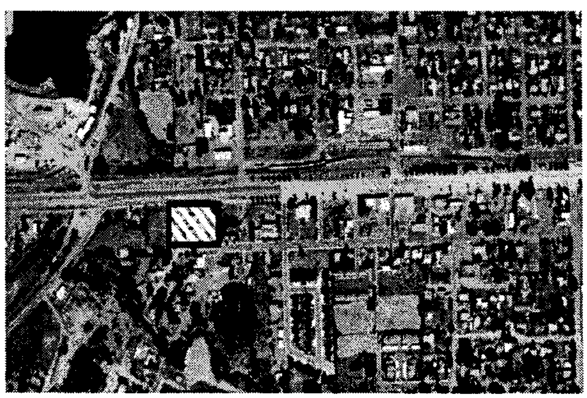


The east approach to Highway 30/Williams Street intersection would likely be developed as a 3-lane cross-section with a separate left-turn lane provided at the traffic signal.

Alt #11	Williams Street Crossing Closure		
Purpose: • Eliminate the unsignalized highway/railroad grade crossing at Williams Street. • Reduce turning movement conflicts along Highway 30.			
Project Description: • Terminates Williams Street just east of the PNWR. • Closes the existing unsignalized Highway 30/Williams Street intersection. • Closes the existing public rail crossing on the east approach to the Highway 30/Williams Street intersection. • Precludes the potential future need to signalize the Highway 30/Williams Street intersection (refer to Alternative #10).			
Constraints: • Needs to be implemented in conjunction with provision of alternative access to the area (refer to Alternative #13). • Requires a public street closure. • Results in the loss of local street connectivity. • May necessitate capacity improvements to other Highway 30 intersections. • Reflects a change to the adopted City of Scappoose TSP.			
Conceptual Cost Estimate:	$20,000	**Implementation Time Frame:**	Long-term
Project Plan View:			

Alt #12A	Fire Station Relocation		
Purpose: • Better facilitate emergency response time. • Remedy the existing facility's non-standard access to Highway 30.			
Project Description: • Relocates the fire station to an alternative site.			
Constraints: • The fire station was constructed at its existing location in 1987. The current site was chosen for its central location. There are no plans to relocate the facility at this time. • May result in unplanned funding expenditures by thear fire department. • This project might be considered more favorably if seismic upgrades or other circumstances require reconstruction of the fire station in the long-term future. • Alternative sites on which to relocate the fire station have not been identified for this project.			
Conceptual Cost Estimate:	Unknown	**Implementation Time Frame:**	Long-term

Project Plan View:



Alt #12B	Train Monitoring		
Purpose: • Improve emergency response time by allowing emergency personnel to identify routes to incidents that are less likely to be impeded by a train.			
Project Description: • Provision of a monitoring system that is comprised of a centralized computer and a series of detectors located along the railroad corridor. • The system identifies the speed of the train, its estimated time of arrival (ETA) and estimated time of departure (ETD) from each rail crossing intersection in real time.			
Constraints: • Requires training of emergency service personnel to operate. • Does not provide emergency service vehicles with right-of-way at rail crossings, rather it provides real-time information to identify the quickest route. • Results in additional operating and maintenance costs.			
Conceptual Cost Estimate:	$5000,000	**Implementation Time Frame:**	Long-term
Sample Project: A pilot program to evaluate the performance of this monitoring system is currently being conducted in College Station, Texas as a joint venture between the City of College Station and the Texas Transportation Institute (TTI). TTI is an official research agency for the Texas Department of Transportation and the Texas Railroad Commission. More information can be obtained at the following website: http://tti.tamu.edu/researcher/v35n2/everysec.stm			

Alt #13	Highway 30/Crown-Zellerbach Intersection Improvements

Purpose:

- Provide a new truck route that results in the reduction of truck traffic on Columbia Avnue.
- Provide enhanced connectivity between Highway 30 and the former quarry/residential area in northeast Scappoose.
- Improve east-west circulation within the City of Scappoose.
- Facilitate further development of the grid street network in northeast Scappoose.
- Improve the approach geometry and traffic signal operations of the Highway 30/Scappoose-Vernonia Road/Crown-Zellerbach Logging Road intersections.

Project Description:

- This project is funded and was identified in the City's adopted TSP.
- Realigns the existing Highway 30/Scappoose-Vernonia Road/Crown-Zellerbach Logging Road intersections.
- Creates a new Major Collector street between Highway 30 and West Lane Road.
- Creates local street connections between Crown-Zellerbach Logging Road and 3rd Street.
- Converts the private rail crossing on the east approach to the Highway 30/Crown-Zellerbach Logging Road intersection to a signalized, public rail crossing.
- Enables the potential closure of the Williams Street rail crossing to the south (refer to Alternative #11).

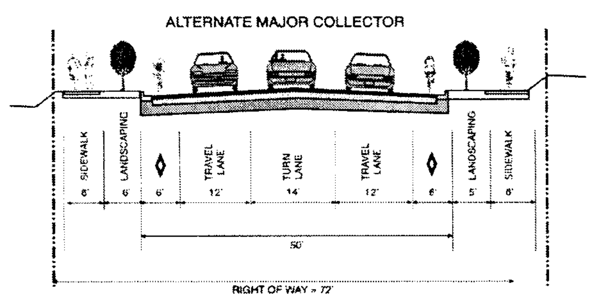
Constraints:

- Results in a new public grade crossing of PNWR.
- Requires modification of the existing Highway 30/Crown-Zellerbach Logging Road traffic signal.
- May require right-of-way acquisition to align Scappoose-Vernonia Road and Crown-Zellerbach Logging Road.
- Existing rail crossing does not meet 1994 AASHTO design standards.

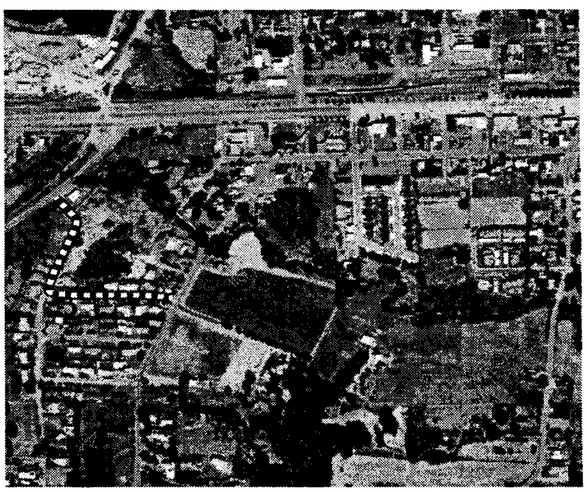
Conceptual Cost Estimate:	$4.0 Million	**Implementation Time Frame:**	Near-term

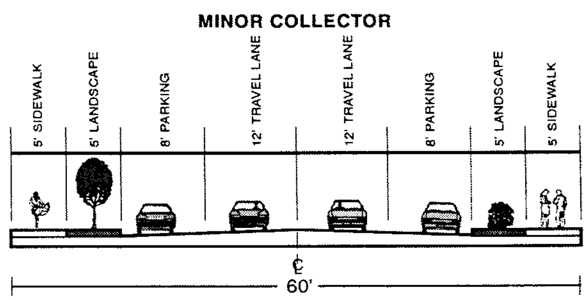
Project Plan View:

Typical Roadway Cross-Section:

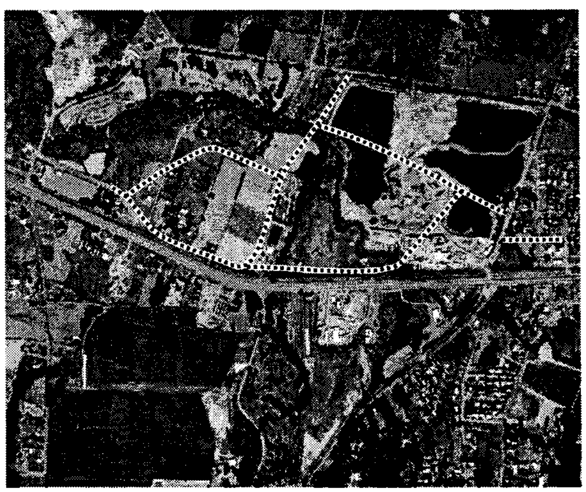


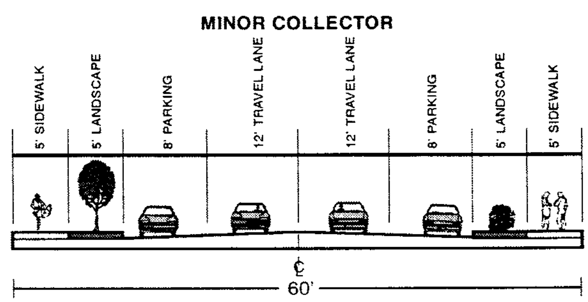
Alt #14	Wheeler Street Extension		
Purpose: • Provide enhanced connectivity between Scappoose-Vernonia Road and the residential area in northwest Scappoose. • Reduce the reliance on Highway 30 to accommodate local trips. • Improve north-south circulation within the City of Scappoose. • Facilitate further development of the grid street network in northwest Scappoose.			
Project Description: • This project was identified in the City's adopted TSP. • Creates a new Minor Collector street between Scappoose-Vernonia Road and 5th Street.			
Constraints: • May require right-of-way acquisition.			
Conceptual Cost Estimate:	$725,000	**Implementation Time Frame:**	Near-term
Project Plan View:		**Typical Roadway Cross-Section:**	



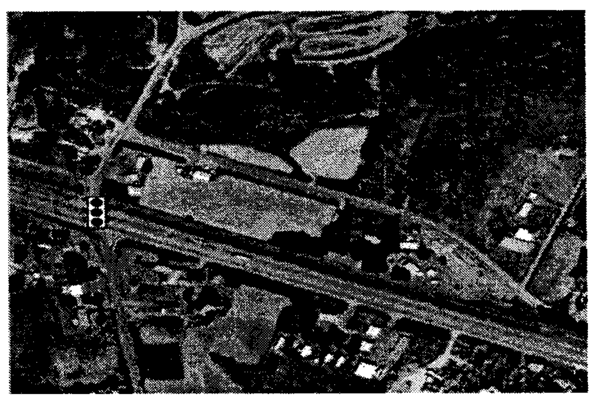


Alt #15	Northeast Scappoose Circulation Plan		
Purpose: • Improve north-south circulation between Crown-Zellerbach Logging Road and West Lane Road. • Provide enhanced connectivity between Highway 30, the local airport, and developable lands in northeast Scappoose. • Reduce the reliance on Highway 30 to accommodate local trips.			
Project Description: • Identifies a preliminary system of collector streets to serve the area bounded by Highway 30 to the west, West Lane Road to the north and east, and Crown-Zellerbach Logging Road to the south. • The new roadway alignments traverse the quarry property, as well as the surrounding properties to the north, and could be incorporated as infrastructure to support sites' redevelopment.			
Constraints: • Requires right-of-way acquisition/dedication. • Requires significant earthwork modification to the quarry site. • Area is currently outside of the Scappoose City Limits and Urban Growth Boundary.			
Conceptual Cost Estimate:	$5.5 Million	**Implementation Time Frame:**	Long-term
Project Plan View:		**Typical Roadway Cross-Section:**	





Alt #16	Highway 30/West Lane Road Intersection Signalization		
Purpose: • Improve the intersection operations of the Highway 30/West Lane Road unsignalized intersection. • Provide alternate signalized access to Highway 30 for properties located in northeast Scappoose.			
Project Description: • Signalizes the existing Highway 30/West Lane Road unsignalized intersection. • Provides interconnect to the adjacent railroad crossing. • Upgrades existing rail crossing detection equipment.			
Constraints: • Results in the construction of a new traffic signal on Highway 30. • Requires turn-lane improvements at the Highway 30/West Lane Road intersection. • Area is outside of the City's urban growth boundary – the *Oregon State Highway Plan* states that a traffic signal on Statewide Highway such as Highway 30 in a rural high-speed area would cause an unsafe condition.			
Conceptual Cost Estimate:	$500,000	**Implementation Time Frame:**	Long-term
Project Plan View:			



HIGHWAY CAPACITY IMPROVEMENT OPTIONS

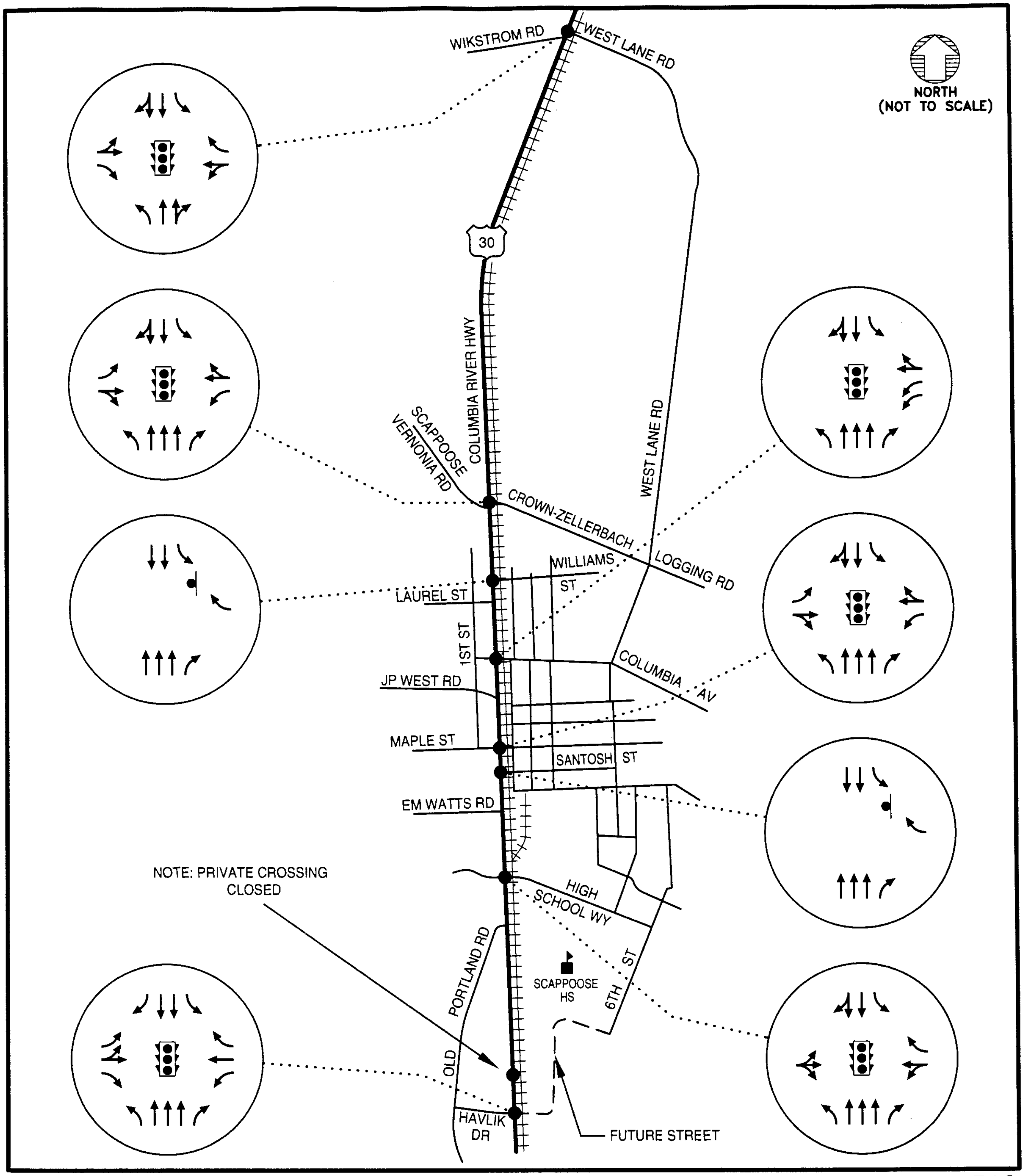
Several potential capacity improvement options were evaluated to address forecast 2025 operational deficiencies identified in the Future Conditions Assessment. This section presents those options and identifies their associated impacts to the transportation system.

Capacity Option #1: Add Third Northbound Through Lane on US Highway 30

Capacity Option #1 involved the construction of an additional northbound through lane on Highway 30. As identified in the City of Scappoose TSP and corroborated by existing traffic counts, significant directionality was found within the daily traffic flows along Highway 30 in the study corridor. During the morning peak period, the predominate flow was southbound as many people commute to the Portland metro area for work. During the evening peak period, the predominate flow was reversed as the commuters head north for their return trip home. In addition to commuter traffic, local trips were made within the corridor during the course of the day. The peak time for local trip making coincided with the evening commuter peak, as it remains common for people to combine trips on their way home from work (e.g., grocery shopping, picking up children at after-school practices, etc.). As such, the evening peak hour was found to be the critical time period when the most demand is placed on Scappoose's transportation system.

Providing an additional northbound through lane would enable greater throughput of commuter traffic, thereby allowing more green time to be allocated to side street approaches at the signalized intersections within the study corridor. Disadvantages associated with this improvement included high construction costs, right-of-way impacts east of Highway 30, modification of all existing intersections within the corridor that have an east approach, and longer pedestrian crossings of Highway 30.

The proposed lane configurations and traffic control devices for Capacity Option #1 are illustrated in Figure 4-10. For the 2025 "full build" growth scenario (includes the three potential development areas), the resulting intersection operations are illustrated in Figures 4-11 and 4-12 for the weekday a.m. and p.m. peak hours, respectively. As shown in Figures 4-11 and 4-12, all of the study intersections were forecast to operate within ODOT's v/c ratio standards during both the weekday a.m. and p.m. peak hours, with the exception of the Highway 30/Havlik Drive intersection. The Highway 30/Havlik Drive intersection operates with a v/c ratio of 0.76 during the weekday a.m. peak hour and would require a second eastbound right-turn lane to meet standard.



FULL BUILD GROWTH SCENARIO 2025 ASSUMED LANE CONFIGURATIONS AND TRAFFIC CONTROL DEVICES

LEGEND

- STOP SIGN
- TRAFFIC SIGNAL

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FIGURE 4-10

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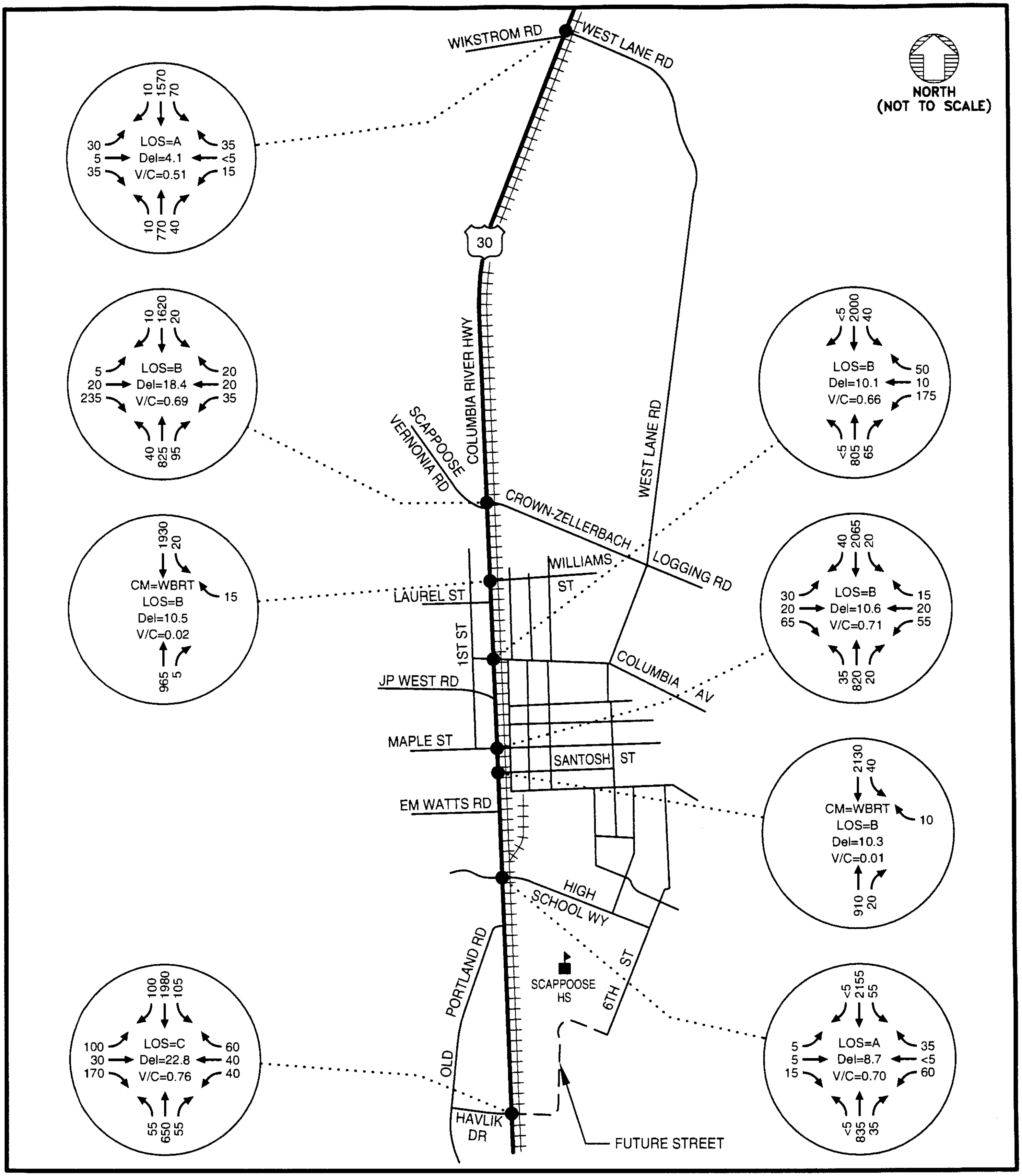

LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/ CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE DELAY (SIGNALIZED)/ CRITICAL MOVEMENT DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

CAPACITY OPTION #1
2025 TRAFFIC CONDITIONS
WEEKDAY AM PEAK HOUR

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FIGURE 4-11

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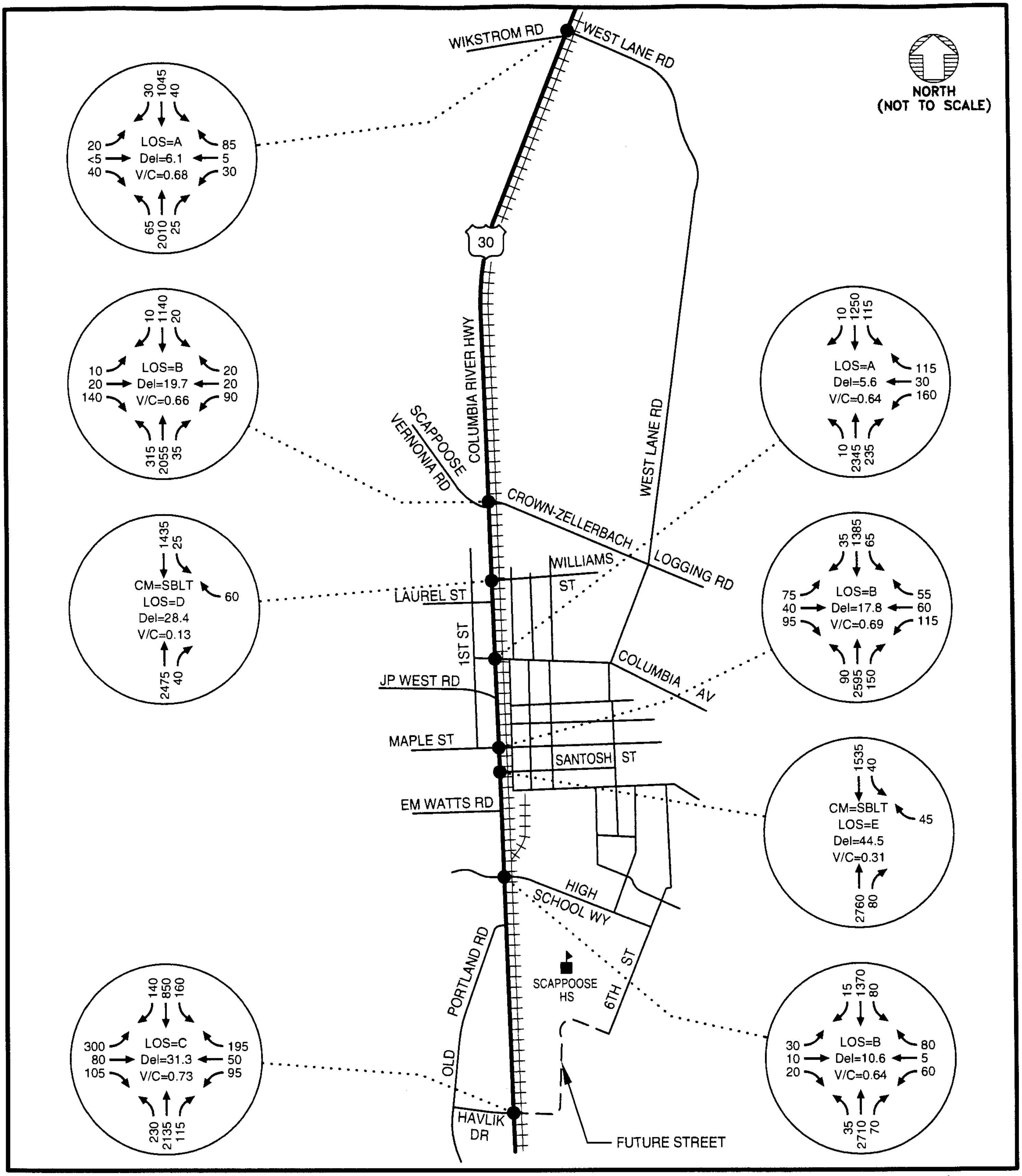

CAPACITY OPTION #1
2025 TRAFFIC CONDITIONS
WEEKDAY PM PEAK HOUR

LEGEND
CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/ CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE DELAY (SIGNALIZED)/ CRITICAL MOVEMENT DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

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FIGURE 4-12

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Capacity Option #2: Transportation Demand Management

Capacity Option #2 would use transportation demand management strategies to reduce the volume of traffic using Highway 30. As discussed previously in Capacity Option #1, a significant number of people commute through the study corridor on their way to and from work. An alternative to building more roadway capacity to accommodate this demand would be to develop or further enhance other modes of travel such as commuter rail or express busing.

Based on preliminary analyses, a 30 percent reduction in vehicles would be required to achieve intersection operations comparable to those resulting from the addition of a third northbound through lane. This is the equivalent of removing approximately 600 northbound through vehicles along Highway 30 during the weekday p.m. peak hour.

The feasibility of implementing an effective demand management strategy may prove difficult in the near-term as there still is sufficient capacity to accommodate current traffic levels. However, as the number of vehicles on the transportation system increases, less spare capacity will be available and greater levels of congestion will result. As a consequence, and in the absence of expanded roadway capacity, the benefit-to-cost ratio of developing alternative modes of transportation becomes more favorable.

Capacity Option #3: Identify an Alternate Highway Segment Designation

Capacity Option #3 involved the adoption of a new highway segment designation for Highway 30 within the City of Scappoose Urban Growth Boundary (UGB). The purpose of adopting a new highway segment designation would be to provide a set of mobility threshold standards that are commensurate with the function of the highway as it passes through the City of Scappoose.

Within the City of Scappoose UGB, Highway 30 is currently classified as a Statewide Highway under the 1999 Oregon Highway Plan (OHP). As defined by the 1999 OHP:

Statewide Highways typically provide inter-urban and inter-regional mobility and provide connections to larger urban areas, ports, and major recreational areas that are not directly served by Interstate Highways. A secondary function is to provide connections for intra-urban and intra-regional trips.

The 1999 OHP also recognizes that the management objective for a particular section of highway depends on the function of the roadway as well as on surrounding land uses. As a result, a subset of highway classifications has been developed to address mobility/accessibility issues where highway accessibility may become more of priority than high-speed, continuous-flow operation.

Highway Designations

A description of each urban highway segment classification follows.

Expressways

Expressways are complete routes or segments of existing two-lane and multi-lane highways and planned multi-lane highways that provide for safe and efficient high-speed and high-volume traffic movements. Their primary function is to provide for interurban travel and connections to ports and major recreation areas with minimal interruptions. A secondary function is to provide for long distance intra-urban travel in metropolitan areas. In urban areas, speeds are moderate to high. Usually there are no pedestrian facilities and bikeways may be separated from the roadway.

Urban Other

The objective of an Urban Other segment designation is to move through traffic efficiently while also meeting the access needs of nearby properties. Access can be provided to and from individual properties abutting an Urban Other segment, but the strong preference is to limit such access, providing it instead on connecting local roads and streets. Transit turnouts, sidewalks, and bicycle lanes are accommodated.

Urban Business Area

The Urban Business Area (UBA) is a highway segment designation that recognizes existing or planned areas of commercial activity or various types of commercial activity centers within the UGB. This designation may be applied within UGBs on District, Regional, or Statewide Highways where vehicular accessibility is important to continued economic viability. The primary objective of the state highway in an Urban Business Area (UBA) is to maintain existing speeds while balancing the access needs of abutting properties with the need to move through traffic.

A UBA may apply to an existing area of commercial activity or future center or node of commercial activity in a community located on a District, Regional or Statewide Highway where speeds are 35 mph (55 kilometers per hour) or less. ODOT has indicated that the designation of UBAs on Statewide Highways should be limited to only those special circumstances where, from a system-wide perspective, the need for local access clearly equals or is greater than the need for mobility for an existing designation. For a new designation, the need for local access must be greater than the need for mobility. Vehicular accessibility is often as important as pedestrian, bicycle, and transit accessibility. Safe and regular street connections are encouraged. Transit turnouts, sidewalks, and bicycle lanes are accommodated.

Special Transportation Area

The primary objective of managing highway facilities in an existing or future Special Transportation Area (STA) is to provide access to community activities, businesses, and residences and to accommodate pedestrian movement along and across the highway in a downtown, business district, and/or community center (including those in unincorporated communities) as defined by Oregon Administrative Rule (OAR) 660-22.

An STA is a highway segment designation that may be applied to a highway segment when a downtown, business district, or community center straddles the state highway within a UGB or in an unincorporated community in accordance with Action 1B.9 Direct street connections and shared on-street parking are encouraged in urban areas and may be encouraged in unincorporated communities. Direct property access is limited in an STA. Local auto, pedestrian, bicycle, and transit movements to the business district or community center are generally as important as the through movement of traffic. Traffic speeds are slow, generally 25 mph (40 kilometers per hour) or less.

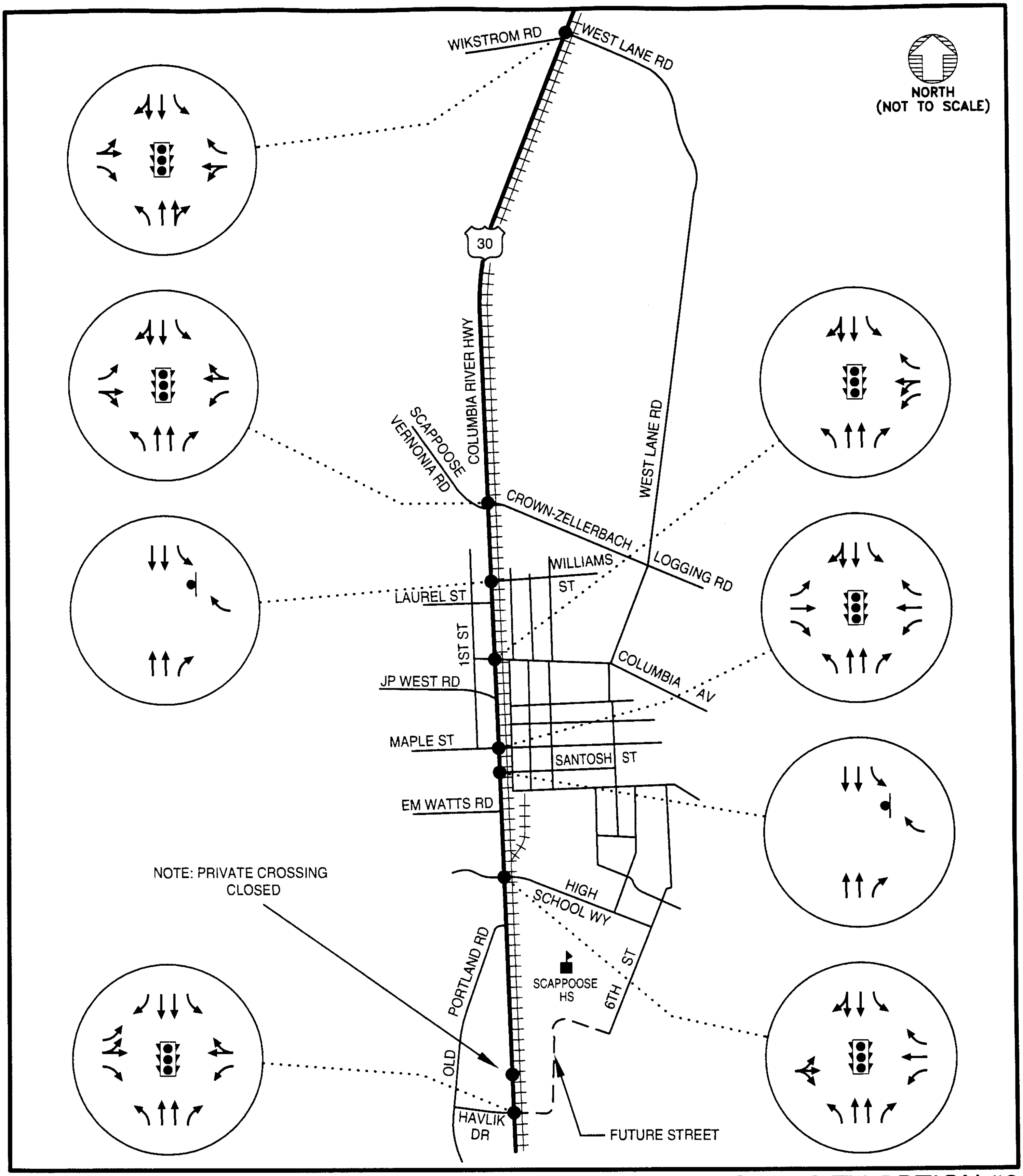
The STA highway segment designation is appropriate for Highway 30 within the City of Scappoose UGB.

Mobility Standards

The 1999 OHP evaluates intersections based on the v/c ratio for peak hour operations. Current ODOT standards for intersections along the Highway 30 study corridor require that a one-hour v/c ratio be less than 0.75 or 0.70, depending on the location. Under the STA highway segment designation, the ODOT standard for all signalized intersections within the Highway 30 study corridor would be to maintain a v/c ratio less than 0.85.

Operational Impacts

By adopting a less conservative v/c ratio standard, the need to develop an additional through lane on Highway 30 could be alleviated. The proposed lane configurations and traffic control devices for Capacity Option #3 are illustrated in Figure 4-13. For the 2025 "full build" growth scenario (includes the three potential development areas), the resulting intersection operations are illustrated in Figures 4-14 and 4-15 for the weekday a.m. and p.m. peak hours, respectively.



LEGEND
- STOP SIGN
- TRAFFIC SIGNAL

CAPACITY OPTION #3
2025 LANE CONFIGURATIONS AND TRAFFIC CONTROL DEVICES

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FIGURE 4-13

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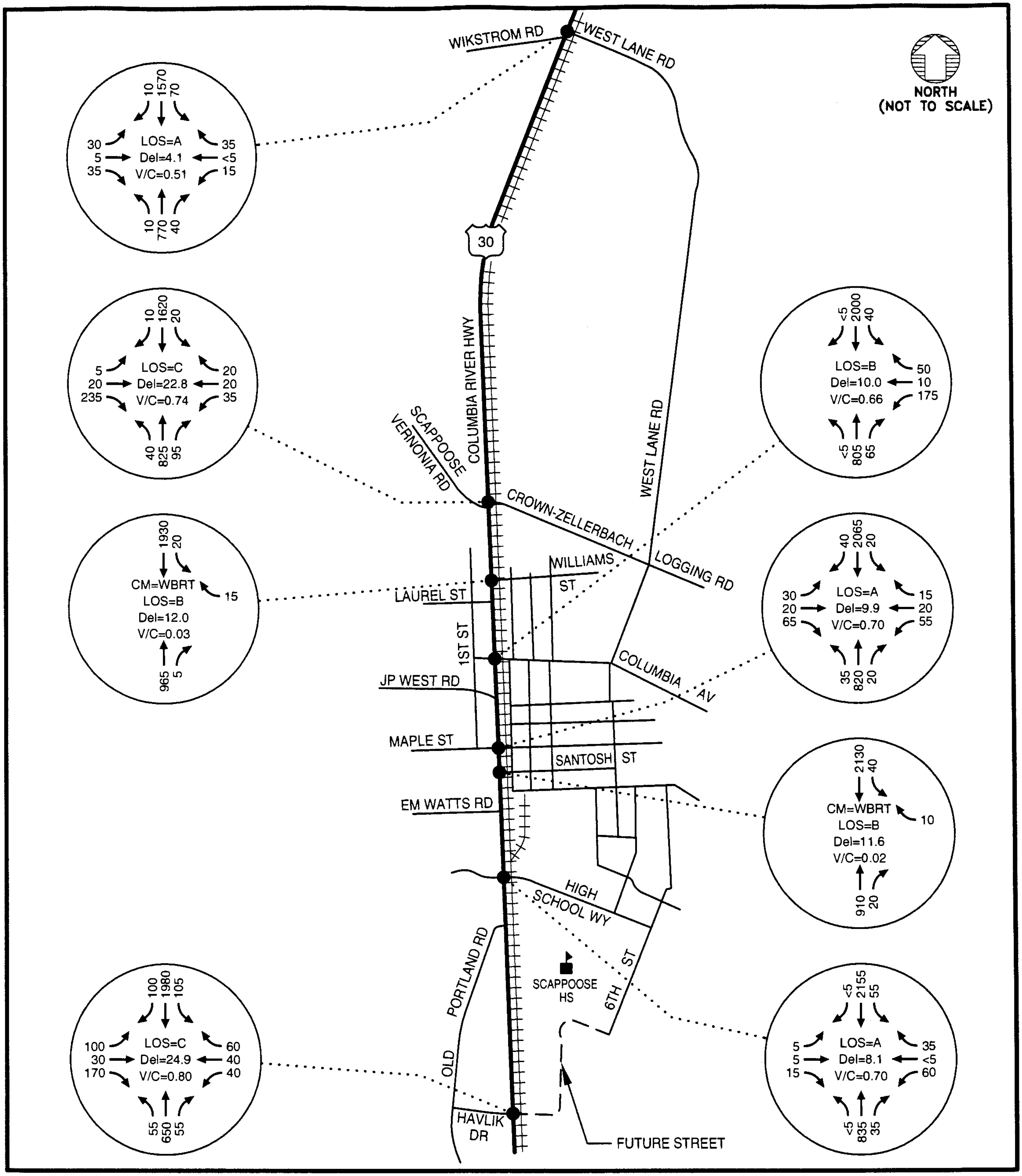

LEGEND
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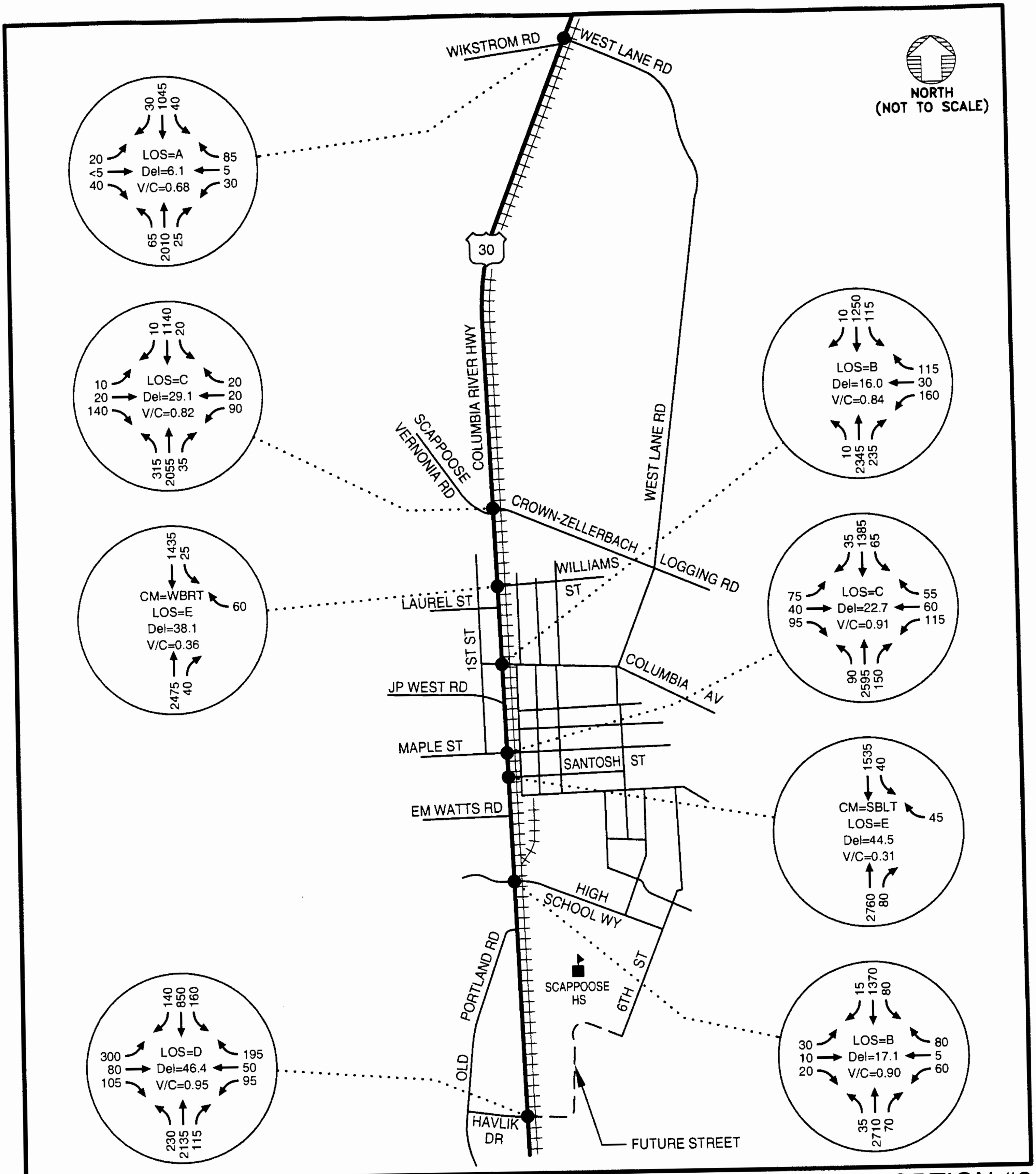
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

CAPACITY OPTION #3
2025 TRAFFIC CONDITIONS
WEEKDAY AM PEAK HOUR

Scappoose Rail Crossing Corridor Study
Scappoose, Oregon **October 2002**

FIGURE
4-14

5225\DWGS\FINAL REPORT\5225F414



CAPACITY OPTION #3
2025 TRAFFIC CONDITIONS
WEEKDAY PM PEAK HOUR

LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/ CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE DELAY (SIGNALIZED)/ CRITICAL MOVEMENT DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Scappoose Rail Crossing Corridor Study
Scappoose, Oregon
October 2002

FIGURE
4-15

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As shown in Figures 4-14 and 4-15, all of the study intersections were forecast to operate within ODOT's v/c ratio standards during both the weekday a.m. and p.m. peak hours, with the exceptions of the Highway 30/Havlik Drive, Highway 30/High School Way, and Highway 30/Maple Street intersections.

The Highway 30/Havlik Drive, Highway 30/High School Way, and Highway 30/Maple Street intersections were forecast to operate with v/c ratios in excess of 0.85 during the weekday p.m. peak hour. However, these intersections were forecast to operate under capacity with v/c ratios of less than 0.95 during the weekday p.m. peak hour. Potential mitigation measures to bring these intersections within standard include development of north/south collector facilities, enhancement of local street connectivity, or implementation of travel demand management strategies.

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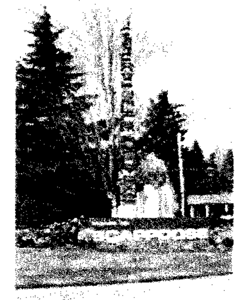
Chapter 5

Preferred Plan

Chapter 5 – Preferred Plan



The preferred alternative plan presented in this chapter identifies the preferred location of rail crossings within the City of Scappoose and provides a series of recommended roadway and rail improvement projects that mitigate existing and projected transportation system deficiencies within the study corridor. The PAC selected the individual elements of the preferred alternative plan during meetings held to deliberate the alternatives presented in Chapter 4.

The list of projects summarized in this chapter were selected based on the feedback and guidance provided by the PAC as well as comments offered by community members at the June 20 and August 15, 2002 public meetings. While not every project received unanimous support, the projects presented in the preferred plan did have the support of the majority of the PAC members.

Considerations

The Oregon Revised Statutes (ORS) provide the state the authority to close railroad grade crossings. Specifically, ORS Chapter 824 reads "It is the policy of this state to achieve uniform and coordinated regulation of railroad-highway crossings and to eliminate crossings at grade wherever possible. To these ends, authority to control and regulate the construction, alteration, and protection of railroad-highway crossings is vested exclusively in the state, and in the Department of Transportation as provided in ORS 824.018 and 824.200 to 824.258."

In reviewing the identification of crossing closures identified in this report, it should be understood that the planning process was constrained by a requirement that at least one public grade crossing be closed for each public crossing that would be created and/or converted to active control devices. ODOT Rail and PNWR stipulated that the closure must be made when the new crossing is opened.

In addition, the PNWR is requiring that the financial cost of maintenance of any new active grade crossings in Scappoose be provided by the City of Scappoose if the new crossing(s) results in an increase in the number of active crossings in the city. There are three active grade crossings in the city today (High School Way, Maple Street, and Columbia Avenue). PNWR crews will perform all maintenance at grade crossings, and the railroad indicated that the cost to do so is approximately $2,500 per year. PNWR indicated that it is currently working with other communities and allowing new grade crossings with active control devices with the understanding that the $2,500 maintenance fee will be paid to the railroad each year to cover its expenses.

Chapter Format

- This chapter is organized into five primary areas of focus:
- Local Access and Circulation Plan,
- Rail Crossing Plan,
- Revised Year 2025 Traffic Operations Analysis,
- Implementation Plan, and
- Future Transportation System Considerations.

LOCAL ACCESS AND CIRCULATION PLAN

The local access and circulation plan identifies transportation improvement projects within the study corridor that are needed to mitigate existing and future access and circulation deficiencies. Some of the proposed improvement projects, such as the Havlik Drive Extension, are consistent with projects previously identified in the City of Scappoose TSP. Others, such as the Williams Street Crossing Closure, deviate from the TSP and require modification of the City's street functional classification map and subsequent amendments to the TSP and Comprehensive Plan.

Figure 5-1 is a revised street classification map that incorporates all of the proposed improvement projects. Figure 5-2 is a map identifying the location of all the proposed improvement projects that are included in the local access and circulation plan. Each of the improvement projects included in the preferred plan is described below.

A. Havlik Drive Extension

The Havlik Drive Extension project creates a new Major Collector street between Highway 30 and Fredrick Street and converts the existing private rail crossing on the east approach to the Highway 30/Havlik Drive intersection to a signalized, public rail crossing.

The purpose of this project is to provide enhanced connectivity between Highway 30 and the residential area east of the railroad tracks. The new crossing will likely be constructed in conjunction with closure of the Santosh Street Crossing (Project "D"). Intersection lane configurations would be constructed as shown in Figure 5-1 and traffic signal interconnect would be provided (refer to Project "I" in this chapter).

Associated benefits:

- Reduces reliance on Highway 30 to accommodate local trips.
- Facilitates provision of non-highway access to properties with rail frontage between High School Way and Havlik Drive.
- Reduces travel demand on High School Way.

- Enhances the ability for emergency service providers to access properties located in southeast Scappoose.

Associated constraints:

- Results in a new public grade crossing of the PNWR.
- Requires modification of the existing Highway 30/Havlik Road traffic signal.
- The difference in elevation between Highway 30 and the PNWR may require that low-clearance vehicles use an alternative crossing (e.g., High School Way).
- Reflects a change to the adopted City of Scappoose TSP.

B. Old Portland Road Realignment

The Old Portland Road Realignment project closes the existing unsignalized Highway 30/Old Portland Road intersection and realigns the north end of Old Portland Road to connect with Walnut Street. The segment of Walnut Street between Highway 30 and the proposed Old Portland Road alignment would be reconstructed to Major Collector street standards. The purpose of this project is to improve motorist safety, particularly during peak times when high through-traffic volumes on Highway 30 limit the number of available gaps for side-street access.

Associated benefits:

- Provides signalized access to and from Old Portland Road via the Highway 30/High School Way intersection.
- Provides enhanced connectivity between High School Way and Havlik Drive west of Highway 30.

Associated constraints:

- Requires right-of-way acquisition.

Requires modification of the Highway 30/High School Way traffic signal to accommodate the cross-section upgrade of Walnut Street.

C. E.M. Watts Road Extension

The E.M. Watts Road Extension project creates a new Minor Collector street between Highway 30 and Elm Street (just west of Third Place) and creates an east approach to the existing Highway 30/E.M. Watts Road signalized intersection. A new signalized, public rail crossing would be developed on the east approach to the Highway 30/E.M. Watts Road intersection.

The purpose of this project is to provide enhanced connectivity between Highway 30 and the residential area east of the railroad tracks. Intersection lane configurations would be constructed as shown in Figure

5-1 and traffic signal interconnect would be provided (refer to Project "I" in this chapter).

Associated benefits:

- Reduces the reliance on Highway 30 to accommodate local trips.
- Improves east-west circulation within the City of Scappoose.
- Facilitates closure of the Santosh Street rail crossing by providing alternative access to impacted properties.

Associated constraints:

- Requires right-of-way acquisition.
- Results in a new public grade crossing of the PNWR.
- Requires modification of the existing Highway 30/E.M. Watts Road traffic signal.
- Reflects a change to the adopted City of Scappoose TSP.

D. Santosh Street Crossing Closure

The Santosh Street Crossing Closure project closes Santosh Street west of First Street and results in the elimination of the existing public rail crossing and the east approach to the Highway 30/Santosh Street intersection. The purpose of this project is to reduce the number of public rail crossings while providing enhanced accessibility and connectivity between Highway 30 and the residential area east of the railroad tracks. This project will likely be completed in conjunction with construction and opening of the new Havlik Drive crossing (Project "A").

Associated benefits:

- Reduces the number of existing closely spaced intersections along Highway 30 within the study corridor.
- Reduces turning movement conflicts along Highway 30.
- Eliminates the unsignalized highway/railroad grade crossing at Santosh Street.

Associated constraints:

- Requires a public street closure.
- Impacts local street connectivity in the vicinity of the rail crossing (alternative access will be provided in conjunction with the E.M. Watts Road Extension).
- Reflects a change to the adopted City of Scappoose TSP.

E. Williams Street Crossing Closure

The Williams Street Crossing Closure project closes Williams Street west of First Street and results in the elimination of the existing public rail crossing and the east approach to the Highway 30/Williams Street intersection. The purpose of this project is to reduce the number of public rail crossings while providing enhanced accessibility and connectivity between Highway 30 and the residential area east of the railroad tracks. This project will likely be completed in conjunction with construction and opening of the new Crown-Zellerbach Logging Road intersection (Project "F")

Associated benefits:

- Eliminates the planned signalization of the Highway 30/Williams Street intersection.
- Reduces turning movement conflicts along Highway 30.
- Eliminates the unsignalized highway/railroad grade crossing at Williams Street.

Associated constraints:

- Requires a public street closure.
- Impacts local street connectivity in the vicinity of the rail crossing (alternate access will be provided in conjunction with the 2002 Second Street Improvement and the Highway 30/Crown-Zellerbach Logging Road Improvements).
- Reflects a change to the adopted City of Scappoose TSP.

F. Highway 30/Crown-Zellerbach Intersection Improvements

The Highway 30/Crown-Zellerbach Intersection Improvements project creates a new Major Collector street between Highway 30 and West Lane Road and converts the private rail crossing on the east approach to the Highway 30/Crown-Zellerbach Logging Road intersection to a signalized, public rail crossing. In addition, this project will realign Scappoose-Vernonia Road and Crown-Zellerbach Logging Road to form a single signalized intersection (currently the east and west approaches are offset).

The principal purpose of this project is to provide an alternative truck route that reduces truck traffic on Columbia Avenue. The project also offers enhanced connectivity between Highway 30 and the former quarry/residential area in northeast Scappoose and to improve the safety and operations of the Highway 30/Scappoose-Vernonia Road/Crown-Zellerbach Logging Road intersection. This project would be completed in conjunction with reconstruction of the rail crossing and Highway 30, Project "S". Intersection lane configurations would be constructed as shown in Figure 5-1 and traffic signal interconnect would be provided (refer to Project "I").

Associated benefits:

- Improves east-west circulation within the City of Scappoose.

- Facilitates further development of the grid street network in northeast Scappoose.
- Facilitates the closure of the Williams Street rail crossing by providing alternative access between Highway 30 and the impacted properties.

Associated constraints:

- Results in a new public grade crossing of PNWR.
- Requires modification of the existing Highway 30/Crown-Zellerbach Logging Road traffic signal.
- May require right-of-way acquisition to align Scappoose-Vernonia Road and Crown-Zellerbach Logging Road.

G. Wheeler Street Extension

The Wheeler Street Extension project creates a new Major Collector street between Scappoose-Vernonia Road and Fifth Street. The purpose of this project is to provide enhanced connectivity between Scappoose-Vernonia Road and the residential area in northwest Scappoose.

Associated benefits:

- Reduces the reliance on Highway 30 to accommodate local trips.
- Improves north-south circulation within the City of Scappoose.
- Provides alternative signalized Highway 30 access (assumes the Highway 30/Crown-Zellerbach Intersection Improvements project to be complete) for the properties west of the Highway located between Scappoose-Vernonia Road and Maple Street.

Associated constraints:

- May require right-of-way acquisition.

H. Highway 30/West Lane Road Intersection Modification

The Highway 30/West Lane Road Intersection Modification project signalizes the Highway 30/West Lane Road intersection and realigns the West Lane Road/Wikstrom Road approaches to reduce the existing geometric skew. The purpose of this project is to improve the safety and operations of the Highway 30/West Lane Road intersection.

This project would likely only be completed in the long-term future as the City's urban growth boundary is expanded to include the intersection and speeds along Highway 30 are reduced. Intersection lane configurations would be constructed as shown in Figure 5-1 and traffic signal interconnect would be provided (refer to Project "I").

Associated benefits:

- Enhances motorist safety.

- Upgrades existing rail crossing detection equipment at the West Lane Road rail crossing.
- Facilitates further development of the street network to the north and east of Scappoose.

Associated constraints:

- Results in the construction of a new traffic signal on Highway 30.
- Traffic signal warrants are not currently met - traffic volumes would have to warrant signalization before ODOT would support the project.
- The intersection is outside of the City's urban growth boundary – the Oregon State Highway Plan states that a traffic signal on Statewide Highway such as Highway 30 in a rural high-speed area would cause an unsafe condition. As a result, an expansion of the City's urban growth boundary to encompass the intersection would likely be necessary prior to signalization of the intersection.
- May require right-of-way acquisition.

I. Signalized Intersection Interconnect

The Signalized Intersection Interconnect project installs conduit and wiring along Highway 30 between Havlik Drive and West Lane Road. The purpose of this project is to provide a communication link between signalized intersections within the study corridor to enable the implementation of coordinated highway traffic signal timing plans. This project may be completed incrementally as new signals are added and existing signals are upgraded or it could be undertaken as a single corridor-wide project.

Associated benefit:

- Improves the efficiency of the transportation system by coordinating the start of green at each signal so that a platoon of vehicles can be progressed through the highway corridor with minimal interruption.
- Can be used to influence corridor travel speeds by ensuring vehicles exceeding the posted speed limit are stopped by red lights.

RAIL CROSSING PLAN

The purpose of the rail crossing plan is to identify the ultimate location and type of all rail crossings within the study corridor so that the closure, enhancement, or construction of individual rail crossings can be effectively coordinated with minimal disruption to both rail and street operations.

Figure 5-3 shows the location of all existing and planned rail crossings. As shown in Figure 5-3, the 2025 plan calls for a combination of nine existing and planned rail crossings within the corridor; two of which are private rail crossings (Private Road Rail Crossing #3 and Private Road Rail Crossing #4). The remaining seven planned rail crossings are public, at-grade rail crossings. Private Road Crossing #3 is the only grade-separated rail crossing within the study corridor. It is expected that Private Road Crossings #3 and #4 will also be closed in the long-term future as roadway infrastructure is developed between Crown-Zellerbach Logging Road and West Lane Road.

The net result of the rail crossing plan is:

- The conversion of two private crossings into public crossings (Havlik Drive and Crown-Zellerbach Logging Road)
- The closure of two existing public rail crossings (Williams Street and Santosh Street)
- The closure of one existing private rail crossing (serving Fountains Galore & More/Time & Time Again, the Candle Factory)
- Construction of a new public rail crossing (E.M. Watts Road) NOTE: There would have to be one additional crossing identified for closure if the E.M. Watts extension were to be constucted.

A brief description of the planned rail crossing improvement projects follows.

J. Havlik Drive Track Raising

This project entails raising the elevation of the railroad in the vicinity of Havlik Drive by approximately 3.5 feet. The project requires the reconstruction of the railroad for approximately 1,700 feet in either direction of the Havlik Drive rail crossing. The track raising would be completed in conjunction with projects "A" and "K".

K. Private Road Rail Crossing #1 Closure

This project closes the Private Road #1 rail crossing as well as the roadway approach to Highway 30. Alternative access will be provided via the extension of Havlik Drive.

L. Private Road Rail Crossing #2 Closure

This project formally closes the Private Road #2 rail crossing as well as the roadway approach to Highway 30. Additional alternate access will be provided via a local street connection to Frederick Street.

At the time this report was prepared, the rail crossing surface had been removed in conjunction with adjacent development activities and only an unpaved approach roadway path remained. ODOT Rail and the PNWR do not consider this crossing closure as being new. Consequently, the closure would not be considered as an exchange for improvements at another crossing since it was closed previously.

M. Downtown Track Lowering Modification

This project entails lowering the section of railroad between High School Way and Columbia Avenue. In this area, the elevation of the railroad is currently approximately 3 feet higher than that of Highway 30. The railroad lowering project would be completed in conjunction with projects "P", "Q", and "R".

N. High School Way Rail Crossing Modification

This project involves upgrading the crossing's existing infrastructure and equipment to accommodate a potential second mainline track through the corridor.

O. E.M. Watts Road Rail Crossing

This project entails the development of a new public crossing in the vicinity of the Steinfeld's Factory site. Construction of the new crossing should provide for a potential second mainline track through the corridor. Lane configurations at the reconstructed intersection of E.M. Watts/Highway 30 should be consistent with Figure 5-1.

P. Steinfeld's Factory Rail Siding Removal

This project involves the removal of the existing rail siding located next to the Steinfeld's Factory site between High School Way and Santosh Street.

Q. Maple Street Rail Crossing Modification

This project involves upgrading the crossing's existing infrastructure and equipment to accommodate a potential second mainline track through the corridor.

R. Columbia Avenue Rail Crossing Modification

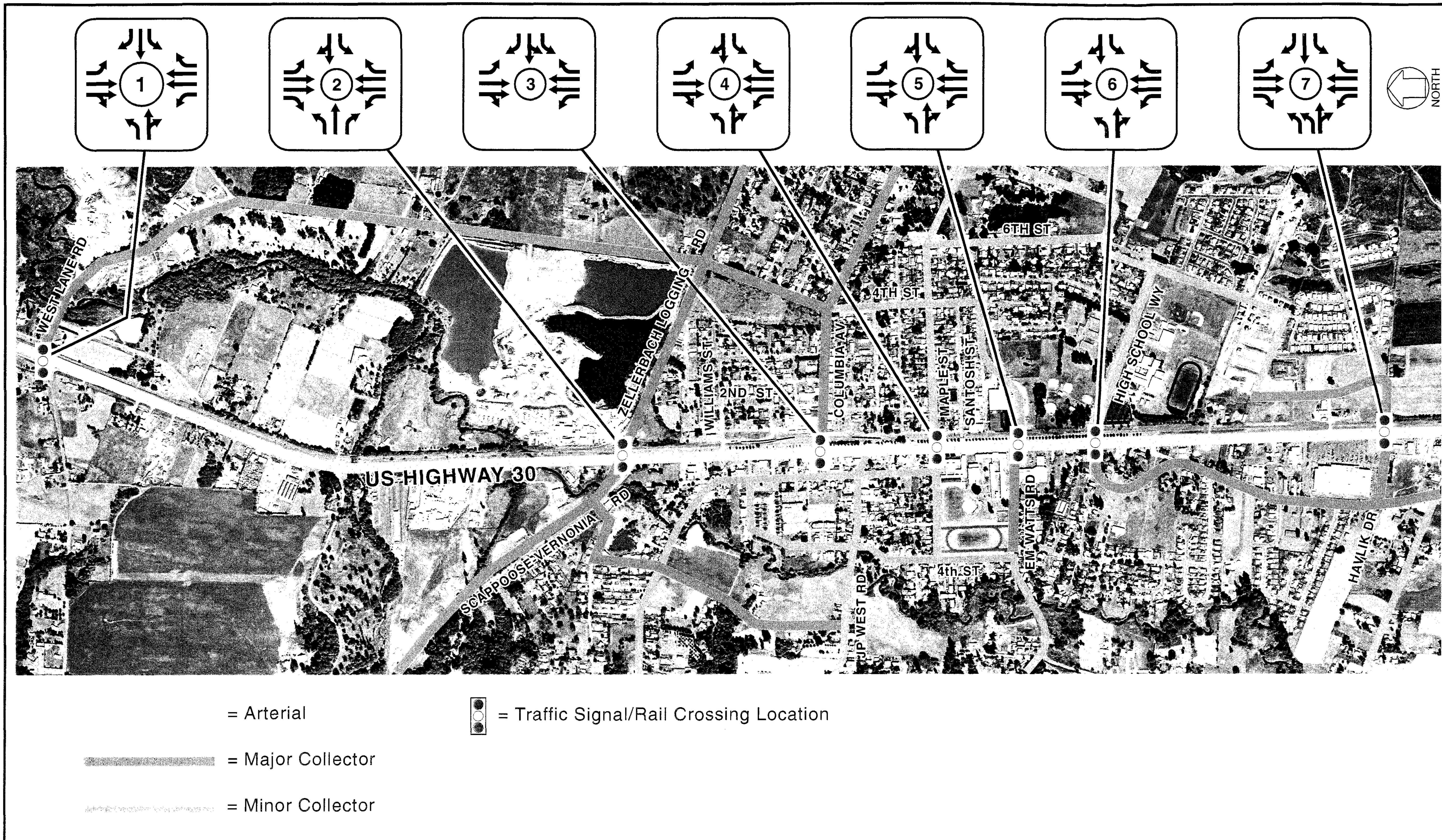
This project involves upgrading the crossing's existing infrastructure and equipment to account for the potential of a second mainline track through the corridor.

S. Crown-Zellerbach Logging Road Rail Crossing Conversion

This project involves converting the crossing from private to public use and upgrading the crossing's existing infrastructure and equipment to account for the potential of a second mainline track through the corridor. This project would be completed in conjunction with project "F".

T. Columbia Avenue/Crown-Zellerbach Rail Siding (Potential Future Commuter Rail Station)

The PNWR has indicated its willingness to work with the community on siding placement as long as it is able to continue to serve its customer base. This project involves the potential for creating a new rail siding between Columbia Avenue and Crown-Zellerbach Logging Road. With the closure of the Williams Street rail crossing, there is approximately 2,000 feet of property between successive crossings where a future commuter rail station could be located.



CORRIDOR ACCESS
AND CIRCULATION PLAN

Scappoose Rail Crossing Corridor Study
Scappoose, Oregon — October 2002

FIGURE 5-1

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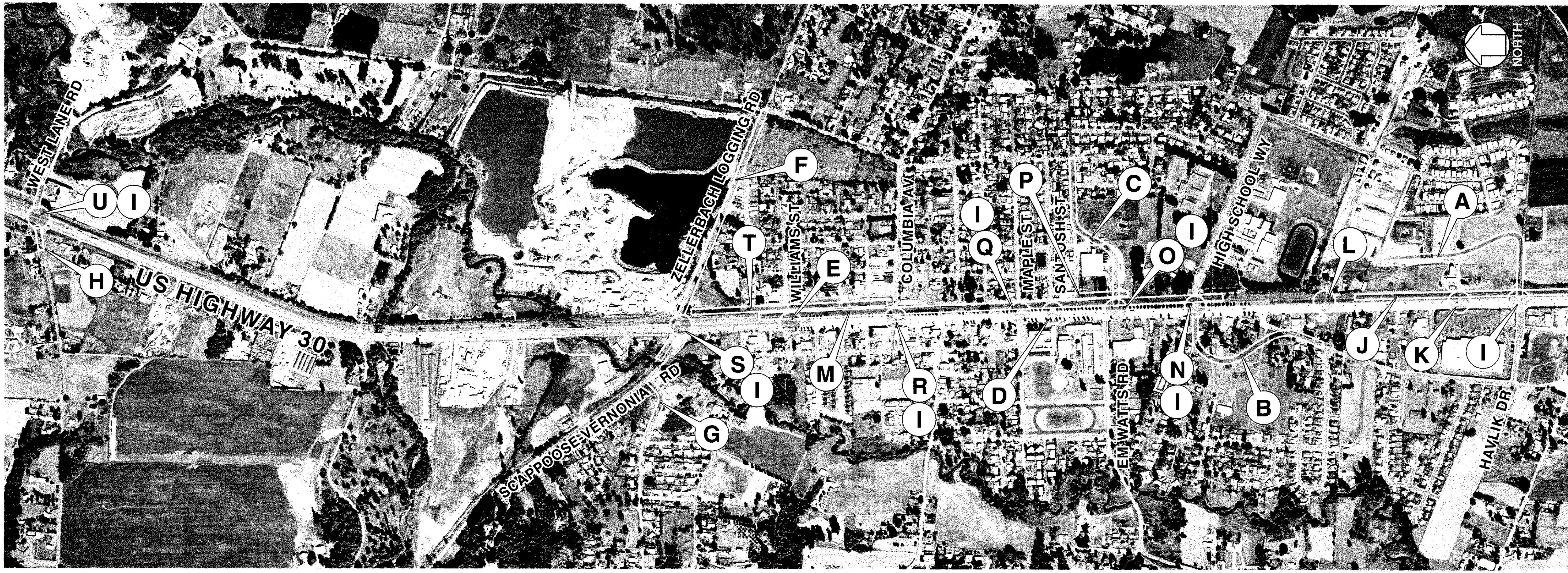

A	Havlik Drive Extension
B	Old Portland Road Realignment
C	E.M. Watts Road Extension
D	Santosh Street Partial Closure
E	Williams Street Partial Closure
F	Highway 30/Crown Zellerbach Intersection Improvements

G	Wheeler Street Extension
H	Highway 30/West Lane Road Intersection Modifications
I	Signalized Intersection Interconnect
J	Havlik Drive Track Raising
K	Private Road #1 Crossing Closure
L	Private Road #2 Crossing Closure

M	Downtown Track Lowering Modification
N	High School Way Crossing Modification
O	E.M. Watts Road Crossing
P	Steinfeld's Factory Rail Siding Removal
Q	Maple Street Crossing Modification
R	Columbia Avenue Crossing Modification

S	Crown-Zellerbach Logging Road Crossing Conversion
T	Columbia Avenue/Crown-Zellerbach Rail Siding
U	West Lane Road Crossing Modification

CORRIDOR IMPROVEMENT PROJECTS

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FIGURE 5-2

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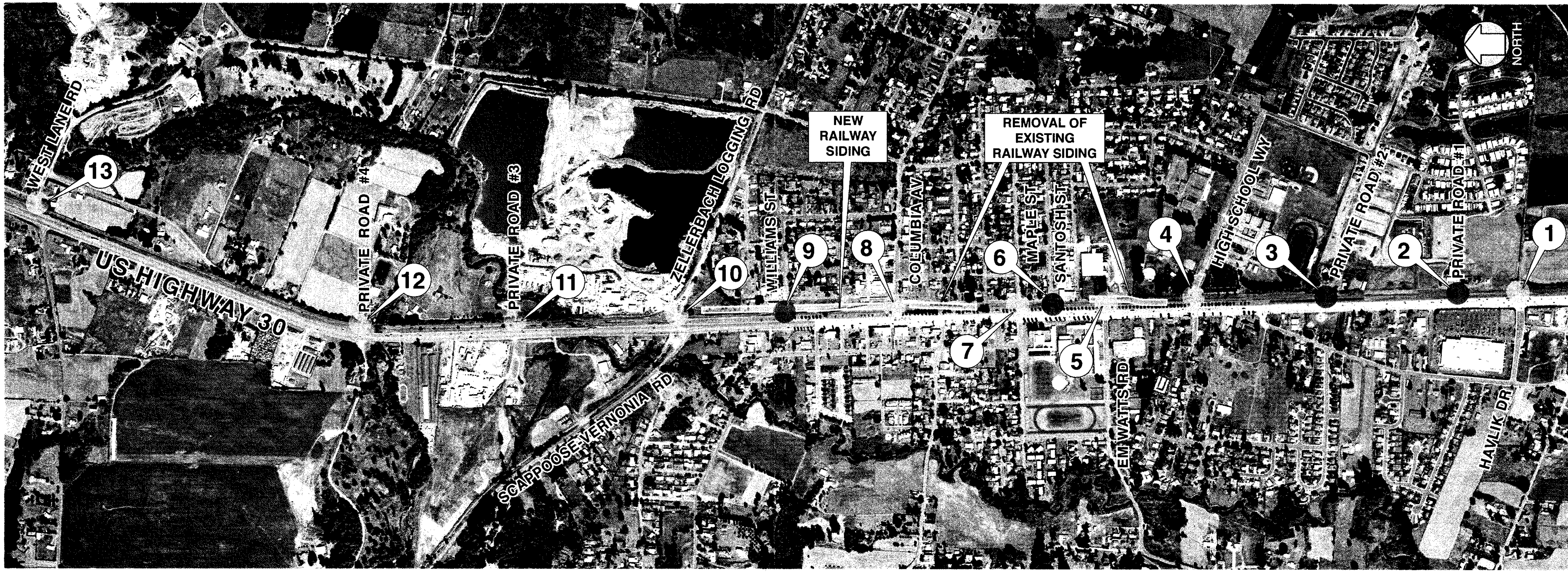

	Description	Location Rail MP	Location Hwy MP	Existing Status	Future Status
1	Havlik Drive	126.8	19.8	Private	Public
2	Private Road #1	126.7	14.9	Private	Closed
3	Private Road #2	126.4	20.2	Private	Closed
4	High School Way	126.3	20.3	Public	Public
5	E.M. Watts Road	126.15	20.53	No Crossing	Public
6	Santosh Street	126.0	20.6	Public	Closed
7	Maple Street	125.9	20.7	Public	Public

	Description	Location Rail MP	Location Hwy MP	Existing Status	Future Status
8	Columbia Avenue	125.71	20.9	Public	Public
9	Williams Street	125.5	21.1	Public	Closed
10	Zellerbach Logging Road	125.3	21.3	Private	Public
11	Private Road #3 *	125.1	21.5	Private	Private**
12	Private Road #4	124.8	21.8	Private	Private**
13	West Lane Road	124.1	22.5	Public	Public

Crossing Location Crossing Closure

* Grade Separated Rail Crossing
** Potential closure in conjunction with Northeast Scappoose Circulation Plan

RAIL CROSSING AND SIDING PLAN

Scappoose Rail Crossing Corridor Study
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FIGURE 5-3

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U. West Lane Road Rail Crossing Modification

This project involves upgrading the crossing's existing infrastructure and equipment to account for the potential signalization of the Highway 30/West Lane Road intersection.

RAILROAD INFRASTRUCTURE IMPROVEMENT PLAN

The preferred alternative plan maintains the current horizontal alignment of both Highway 30 and the PNWR railroad and focuses on developing enhanced at-grade rail crossings within the corridor. To maintain the existing horizontal alignments of both Highway 30 and the PNWR railroad, several issues concerning vertical profile and grade crossing equipment improvements need to be addressed and balanced. The following sections provide a description of each of these issues.

Vertical Profile

Throughout the most of the study corridor, the horizontal alignments of Highway 30 and the PNWR are separated by approximately 50 feet; however, their elevations do not coincide and can differ by as much as 3.5 feet. As a result, all but one of the planned long-term rail crossings (West Lane Road) fails to meet the current American Association of State Highway Transportation Officials (AASHTO) design standard for rail crossings.

To mitigate the difference in vertical profiles, the preferred alternative plan will raise the portion of railroad track near Havlik Drive, lower the section of track between High School Way and Columbia Avenue, and raise the elevation of Highway 30 in the vicinity of the Crown-Zellerbach Logging Road. A corridor-wide profile of the track and highway elevation changes is illustrated in Figure 5-4. This "sectional" approach could be completed in several phases or all at once.

To lower the railroad between High School Way and Columbia Avenue without impacting existing railroad operations requires an alternative track for trains to be operated on while the existing mainline is excavated and a new subgrade is established. There are two options to providing the necessary track lowering. One option is to construct a temporary shoofly track east of the existing mainline. Trains could then be diverted to the shoofly while the existing mainline is lowered and reconstructed. Once the mainline work is completed, trains would be shifted back to the new mainline and the shoofly removed.

Alternatively, a new track could be constructed 15 feet east of the existing mainline track at the lowered elevation. The new alignment would consist

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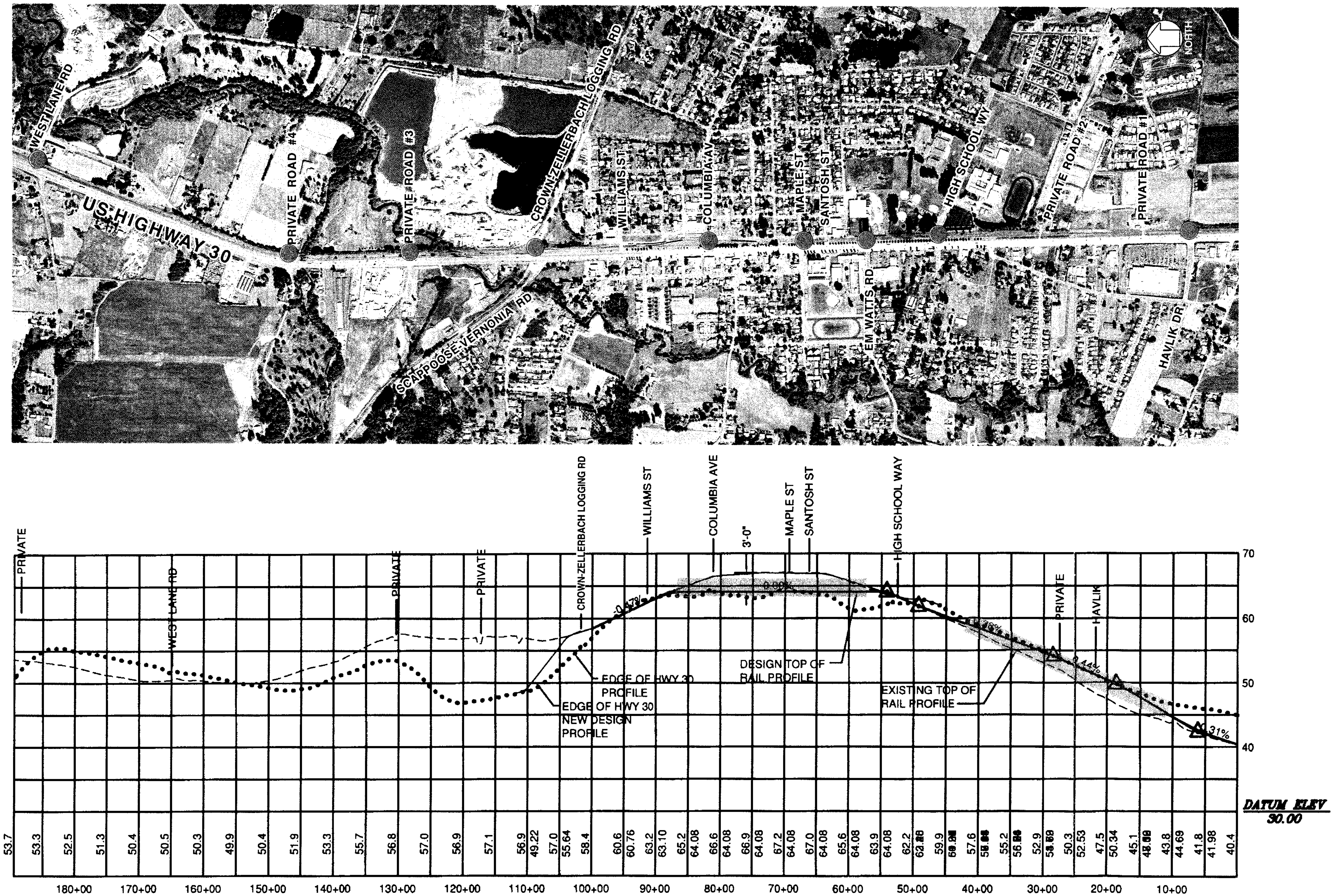

● = Planned Crossing Location

PROPOSED HWY 30 AND PNWR HORIZONTAL ALIGNMENT AND VERTICAL PROFILE

Scappoose Rail Crossing Corridor Study
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FIGURE 5-4

i:\projfile\5225\dwgs\finalreport\5225f504.cdr of new track materials meeting mainline track standards. Once the new track is in place, the existing mainline rail traffic would be shifted onto the new alignment. The existing track could then be removed and graded to meet the roadway elevations and provide sufficient drainage for the track. New roadway approaches then could be constructed meeting either the current AASHTO standards. In the future, the existing mainline could then be reconstructed as the railroad's second track.

Grade Crossing Improvement Requirements

Assuming that the existing public rail/highway grade crossings along the rail corridor will be maintained, all of them will ultimately require some level of improvement. In addition to geometric changes necessary to better meet design standards and increase intersection roadway capacity, safety enhancements will be needed including active protection devices such as gates, lights, and bells.

Pre-emption and Interconnect Requirements

For safety reasons, all of the grade crossings with active control devices will require an adjacent traffic signal on Highway 30. The traffic signal will be used to facilitate the transfer of right-of-way from the roadway to train traffic as trains approach and use the grade crossing. The traffic signal is used to move any side street traffic waiting on the grade crossing approach to the highway before the train arrives, thereby ensuring that no vehicles are trapped on the crossing as the train approaches. This signal pre-emption process requires a communication connection, known as "interconnect", between the traffic signal equipment and the railroad equipment. The interconnect link allows the railroad equipment to communicate the approach and presence of a train to the traffic signal equipment.

Interconnect is currently provided at the grade crossings of Columbia Avenue, Maple Street, and High School Way. At each crossing, the active grade crossing devices (gates and bells) are physically interconnected with the adjacent traffic signal on Highway 30. When a train approaches the crossing, the traffic signal's normal operations are pre-empted and the traffic signal shifts focus to moving vehicles off of the roadway approach with the grade crossing. Signs are also illuminated on the highway to prevent highway traffic from turning onto the grade crossing.

The Existing Conditions chapter explained that the three grade crossings with pre-emption capability currently use a flashing yellow light on the side streets to clear out the grade crossing during a train's approach. This technology is gradually being replaced (as grade crossings are upgraded) by new equipment that provides a "green clearout." Essentially, instead of using up a flashing yellow light to clear the grade crossing during train pre-emption, the new technology shuts down all movements at the signal except for the grade crossing approach. The grade crossing approach is given a green light (and protected left-turn arrow, if appropriate) to clear the crossing; hence the term "green clearout."

Detection Requirements

Any improvements to the grade crossings in Scappoose will require that the existing equipment be replaced with new equipment that can provide the green clearout. To provide enough time for the railroad equipment to communicate with the traffic signals, have the traffic signal provide the green clearout, and then have the crossing safely provide the right-of-way to the passing train, a significant amount of track detection must be provided on the railroad. Depending on train speeds, the necessary track detection can extend several hundred feet to either side of the crossing. Closely spaced crossings can further complicate detection efforts because the detection fields of adjacent crossings can overlap with each other, requiring additional hardware and software modifications and expense.

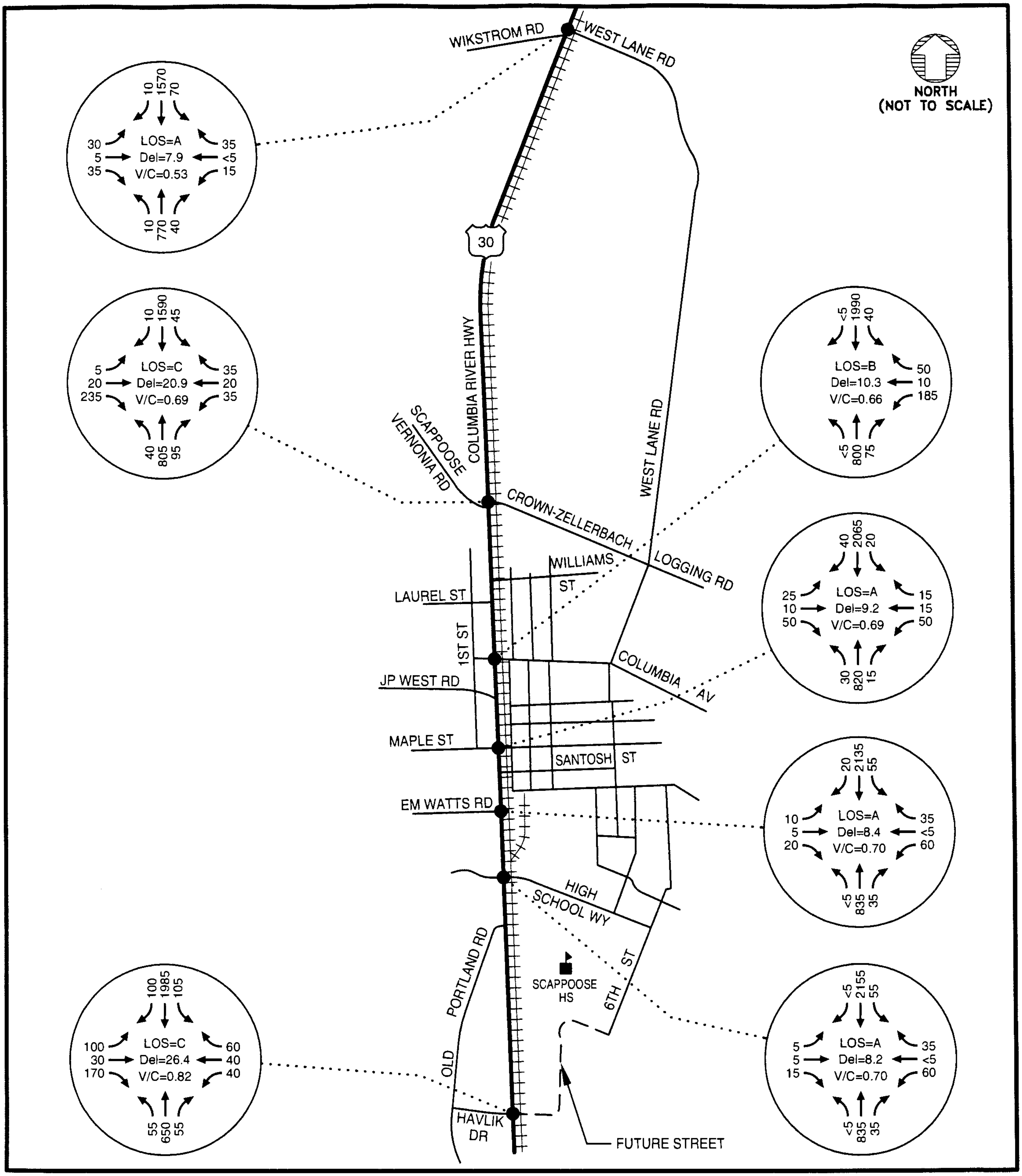
Revised Study Intersection Operations with Preferred Alternative Plan Improvements

Several potential capacity improvement options were evaluated to address the 2025 forecast operational deficiencies identified in Chapter 3. This section presents a summary of the preferred option and provides a revised intersection operations analysis to account for the associated impacts of the local access and circulation improvement projects identified in the beginning of this chapter.

REVISED 2025 FORECAST TRAFFIC OPERATIONS

Traffic volumes at the study intersections were redistributed to account for the closure, conversion, and construction of rail crossings identified as part of the preferred alternative plan. Figure 5-1 shows the proposed lane configurations and traffic control devices for the preferred alternative plan. Figures 5-5 and 5-6 show the resulting intersection operations for the weekday a.m. and p.m. peak hours, respectively, for the 2025 "full build" growth scenario (includes the three potential development areas), .

As shown in Figure 5-5, all of the study intersections are forecast to operate within ODOT's v/c ratio standards during the weekday a.m. peak hour, with the exception of the Highway 30/Havlik Drive intersection. As



REVISED FORECAST 2025 TRAFFIC CONDITIONS WEEKDAY AM PEAK HOUR

LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/ CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE DELAY (SIGNALIZED)/ CRITICAL MOVEMENT DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

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FIGURE 5-5

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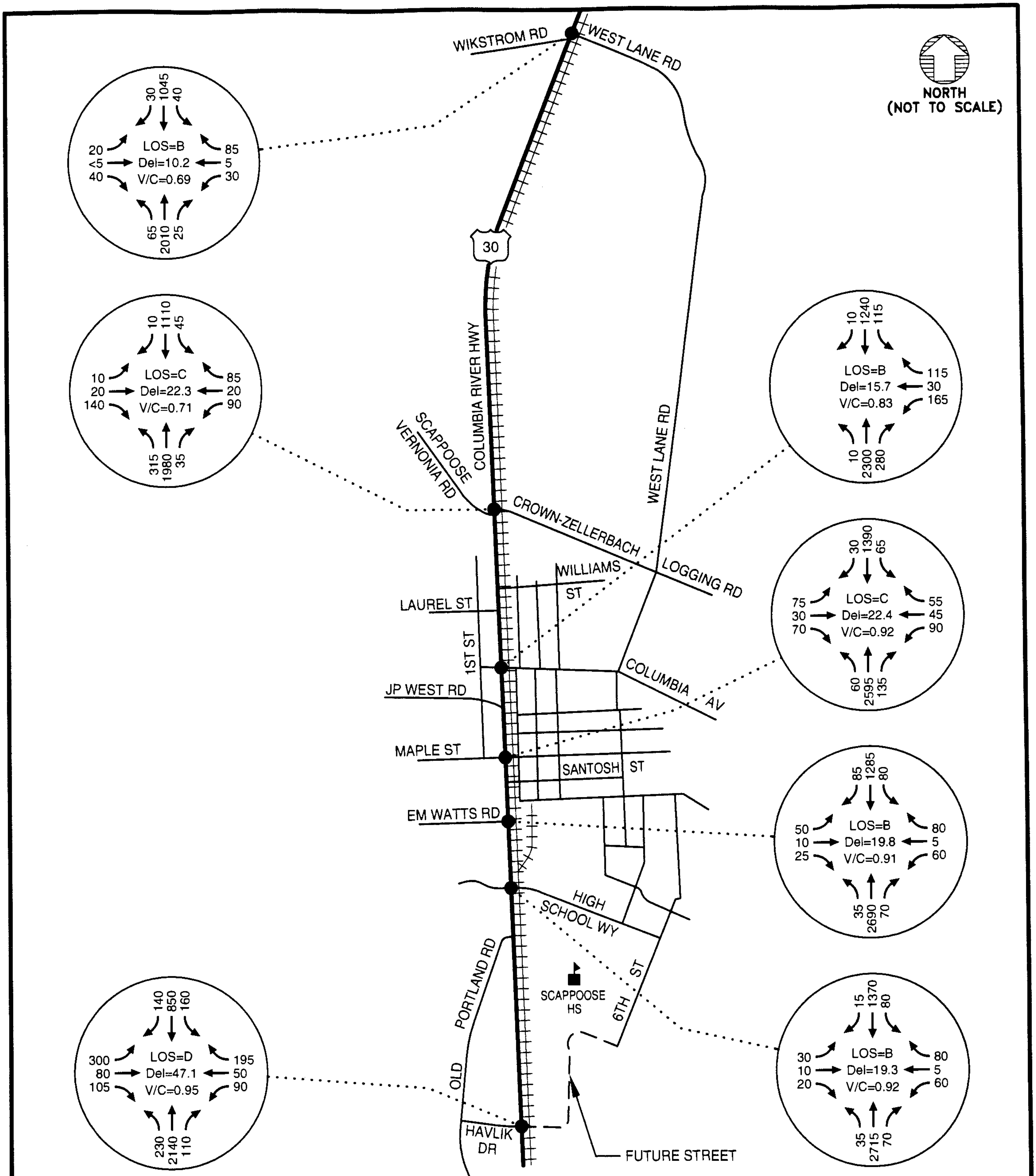

LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/ CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE DELAY (SIGNALIZED)/ CRITICAL MOVEMENT DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

REVISED FORECAST 2025 TRAFFIC CONDITIONS WEEKDAY PM PEAK HOUR

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FIGURE 5-6

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shown in Figure 5-6, only the Highway 30/Scappose-Vernonia Road and Highway 30/West Lane Road study intersections are forecast to operate within ODOT's v/c ratio standards during the weekday p.m. peak hour.

It should be noted that the impact of transportation demand management strategies was not accounted for in the revised analysis. However, even in the absence of such strategies, all study intersections are still forecast to operate below capacity under 2025 traffic conditions during both the weekday a.m. and p.m. peak hours.

Transportation Demand Management Strategies

Based on feedback received during the last two PAC/TAC meetings, the implementation of transportation demand management strategies was identified as the preferred option to address capacity constraints within the study corridor. Transportation demand management strategies such as bus rapid transit or commuter rail will help reduce the volume of traffic using Highway 30. As previously discussed in Chapters 3 and 4, a significant number of people commute through the study corridor on their way to and from work. Accommodating this demand through the construction of additional highway lanes is not a feasible alternative given monetary, policy, and right-of-way constraints.

The feasibility of implementing an effective demand management strategy may prove difficult in the near-term as there still is sufficient capacity to accommodate current traffic levels. However, as the number of vehicles on the transportation system increases, less spare capacity will be available and greater levels of congestion will result. As such, without the ability to expand roadway capacity, the benefit-to-cost ratio of developing alternative modes of transportation becomes more favorable.

Based on a preliminary analysis, the transportation demand management strategies will need to attain a 30 percent reduction in vehicles to operate within ODOT's v/c ratio standards during the critical weekday p.m. peak hour. This is the equivalent of removing approximately 600 northbound through vehicles along Highway 30 during the weekday p.m. peak hour.

IMPLEMENTATION PLAN

The implementation plan identifies the sequencing of the preferred alternative plan improvement projects. Each improvement project has been assigned a priority level with regard to its implementation. Priority Level 1 corresponds to a short-term implementation horizon (i.e., 0 to 2 years), whereas Priority Level 7 project corresponds to a long-term implementation horizon (i.e., 15 to 20 years). Table 5-1 shows the order in which the preferred alternative plan should be implemented. It should be noted that, if funding and local conditions permit, some projects such as the Old Portland Road Realignment may be completed ahead of the sequence identified in Table 5-1.

Table 5-1
Implementation Plan

Project Code	Project Title	Priority Level	Estimated Cost
F/S	Highway 30/Crown-Zellerbach Intersection Improvements	1	$4,000,000
E	Williams Street Closure	1	$20,000
H	Wheeler Street Extension	2	$725,000
J/A	Havlik Drive Track Raising/ Havlik Drive Extension	3	$1,500,000
K	Private Road Rail Crossing #1 Closure	3	$20,000
L	Private Road Rail Crossing #2 Closure	3	$20,000
B	Old Portland Road Realignment	4	$615,000
M/N/Q/R	Downtown Track Lowering Modification Includes: - High School Way Rail Crossing Modification - Maple Street Rail Crossing Modification - Columbia Avenue Rail Crossing Modification	5	$7,700,000
D	Santosh Street Crossing Closure	5	$30,000
P	Steinfeld's Factory Rail Siding Removal	5	Other*
T	Columbia Avenue/Crown-Zellerbach Rail Siding (Future Commuter Rail Station)	5	Other*
I	Signalized Intersection Interconnect	5	$60,000
C/O	E.M. Watts Road Extension/Rail Crossing	6	$1,500,000
H/U	Highway 30/West Lane Road Intersection Modification/Rail Crossing	7	$1,000,000

**This project likely to be completed only in conjunction with railroad mainline reconstruction*

FUTURE TRANSPORTATION SYSTEM CONSIDERATIONS

In addition to the projects listed with the Local Access and Circulation Plan and the Rail Crossing Plan, several improvement projects were identified to address forecast needs or deficiencies that may or may not be mitigated with the implementation of the preferred alternative plan. A brief description of each long-term project consideration follows.

F1. Maple Street Crossing Closure

The Maple Street Crossing Closure project closes Maple Street between Highway 30 and NE First Street and results in the elimination of the existing public rail crossing and the east approach to the Highway 30/Williams Street intersection. The purpose of this project is to minimize the number of rail crossings while providing enhanced accessibility and connectivity between Highway 30 and the residential area east of the railroad tracks. The crossing would likely be closed in conjunction with the creation of a new grade crossing at E.M. Watts Road (Project "C").

Associated benefits:

- Reduces the number of existing closely spaced intersections along Highway 30 within the study corridor.
- Reduces turning movement conflicts along Highway 30.
- Eliminates the public rail crossing at Maple Street.

Associated constraints:

- Requires a public street closure.
- Impacts local street connectivity in the vicinity of the rail crossing (alternate access will be provided in conjunction with the E.M. Watts Road Extension).
- Requires modification of the existing Highway 30/Maple Street traffic signal.

F2. Third Street Extension

The Third Street Extension project creates a new Minor Collector street between High School Way and Elm Street. The purpose of this project is to provide enhanced connectivity in the vicinity of the Steinfeld's Factory and to create a parallel north-south collector facility to Highway 30.

Associated benefits:

- Improves north-south circulation within the City of Scappoose.
- Provide alternative local access to the Scappoose High School.
- Redistributes traffic that would otherwise use 5th Street, 6th Street, and Highway 30.

Associated constraints:

- Requires right-of-way acquisition.
- Creates a new intersection along High School Way in the vicinity of the high school.

F3. Highway 30/Columbia Avenue Intersection Modification

The Highway 30/Columbia Avenue Intersection Modification project converts the west approach of the Highway 30/Columbia Avenue signalized intersection from one-way operations (westbound only) to two-way operations and prohibits left-turns from the west approach. The purpose of this project is to provide alternative signalized access to Highway 30 for properties in the vicinity located on the west of Highway 30 (e.g., the post office).

Associated benefits:

- Improves east-west circulation within the City of Scappoose.
- Facilitates the further development of the grid street network in northwest Scappoose.

Associated constraints:

- Requires modification of the existing Highway 30/Columbia Avenue signalized intersection.
- May result in the loss of on-street parking and/or structures on the west approach to the Highway 30/Columbia Avenue intersection.

F4. Train Monitoring Program

The Train Monitoring Program project implements a monitoring system that is composed of a centralized computer and a series of detectors located along the railroad to detect the real-time location of trains within the corridor. The system identifies the speed of the train, its estimated time of arrival (ETA) and estimated time of departure (ETD) from each rail crossing intersection in real time.

Associated benefits:

- Improves emergency response time by allowing emergency personnel to identify routes to incidents that are less likely to be blocked by a train.
- Facilitates the further development of the grid street network in northwest Scappoose.

Associated constraints:

- Requires training of emergency service personnel to operate.
- Results in additional operating and maintenance costs.

F5. Northeast Scappoose Circulation Plan

The Northeast Scappoose Circulation Plan project identifies a preliminary system of roadway facilities to serve the area bounded by Highway 30 to the west, West Lane Road to the north and east, and Crown-Zellerbach Logging Road to the south. The purpose of this project is to locate collector street facilities in a manner that will address the transportation needs for the potential development of 435 acres of light industrial use in the vicinity of the Scappoose Airport. It is expected that, as this circulation plan is completed, the two private rail crossing locations (Private Road #3 and #4) in the area will be closed.

Associated benefits:

- Improve north-south circulation between Crown-Zellerbach Logging Road and West Lane Road.

- Provides a framework for the further development of the grid street network in northwest Scappoose.
- Facilitates provision of non-highway access to properties with rail frontage between Crown-Zellerbach Logging Road and West Lane Road.
- Provides for closure of two private grade crossings through consolidation to adjacent crossings with active control devices.

Associated constraints:

- Requires right-of-way acquisition/dedication.
- Requires significant earthwork modification to the quarry site.
- Area is currently outside of the Scappoose City Limits and Urban Growth Boundary.

F5. Johnson Landing Road/Dike Road Grade Crossing Improvements

While outside of the scope of this study, community comments were received during the final public meeting questioning the possibility of future grade crossing and roadway improvements near the Highway 30.Johnson Landing Road intersection.

This intersection was not included in the rail corridor study due to its location outside of the City of Scappoose urban growth boundary; however, it is possible that future growth of the community could result in incorporation of the intersection within the City. No near-term signalization of the intersection could be approved by ODOT because the Oregon State Highway Plan states that a traffic signal on Statewide Highway (such as Highway 30) in a rural high-speed area would cause an unsafe condition.

It is recommended that the City and ODOT consider the potential for future improvements to the intersection and grade crossing. Long-term future improvements may include signalization of the intersection and corresponding grade crossing improvements if it were to be brought into city limits.

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Chapter 6

References

Chapter 6 – References

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