Carlton Transportation System Plan

Carlton, Oregon

June 2009

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Transportation System Plan

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Section 1
Introduction

Introduction

The *Carlton Transportation System Plan* (TSP) establishes the City's goals, policies and strategies for developing and improving the transportation system within the Carlton Urban Growth Boundary. The Carlton TSP serves as a twenty-year plan to guide transportation improvements and enhance overall mobility for vehicles, pedestrians and bicyclists throughout the city.

TRANSPORTATION PLANNING REQUIREMENTS

The Carlton TSP was developed in accordance with the requirements of Statewide Planning Goal 12 - Transportation and the Transportation Planning Rule (TPR - OAR 660, Division 12). The purpose of Statewide Planning Goal 12 (Transportation) is "to provide and encourage a safe, convenient and economic transportation system."

Statewide Planning Goal 12 is implemented through the Oregon Transportation Planning Rule (TPR), which requires local governments and state agencies to prepare and adopt TSPs. A TSP is defined as "a plan for one or more transportation facilities that are planned, developed, operated and maintained in a coordinated manner to supply continuity of movement between modes, and within and between geographic and jurisdictional areas." The TPR encourages multi-modal transportation systems to reduce the dependence on auto traffic.

Statewide Planning Goal 12 and the TPR provide the following guidelines for developing a TSP:

> "A transportation plan shall (1) consider all modes of transportation including mass transit, air, water, pipeline, rail, highway, bicycle and pedestrian; (2) be based upon an inventory of local, regional, and state transportation needs; (3) consider the difference in social consequences that would result from utilizing differing combinations of transportation modes; (4) avoid principal reliance upon any one mode of transportation; (5) minimize adverse social, economic and environmental impacts and costs; (6) conserve energy; (7) meet the needs of the transportation disadvantaged by improving transportation services; (8) facilitate the flow of goods and services so as to strengthen the local and regional economy; and (9) conform with local and regional comprehensive land use plans."

Benefits of a well-planned transportation system:

- Affords residents, businesses, and visitors alike, convenient and efficient **mobility** throughout the community in a **safe** manner.
- Encourages **economic development**, in terms of both direct construction spending, and helping reduce the costs of transporting goods and service through an efficient transportation system.
- Provides individuals and households greater **choice** and freedom to access the transportation system in many different ways.
- Influences the character and **appearance** of the community through the design and development of transportation facilities.

Although the City of Carlton is eligible for an exemption to the TPR requirements since the City's current population is less than 2,500, Carlton elected to develop and maintain an updated TSP in

order to better manage the City's transportation facilities and promote the development of a safe, well-planned transportation system.

DEVELOPMENT OF THE TRANSPORTATION SYSTEM PLAN

Since the TSP was adopted by the City in 1999, Carlton has experienced significant population and employment growth, which have resulted in a number of changes to the City's transportation system. The 2009 TSP update was initiated in response to recent population and employment changes, and to ensure the transportation system can adequately meet the City's needs through the year 2030. The 2009 TSP update was also initiated to address key transportation issues identified by the community. Key transportation issues that were identified by the community and addressed as part of the 2009 TSP update include the following:

- Recently Rezoned Areas - identify transportation improvements needed to serve areas recently rezoned to meet the City's projected residential and employment land needs through the year 2027 as part of the 2007 Carlton Comprehensive Plan update.

- Local Street Network Plan – incorporate recent amendments to the Local Street Network Plan and update for recently rezoned areas.

- Bicycle and Pedestrian elements – were not adequately addressed in 1999 TSP and are outdated. An update is needed to identify and provide detailed project descriptions and cost estimates for an improved system of pedestrian and bicycle routes and investigate the feasibility of a trail within or along railroad right-of-way and spur routes. A recent City emphasis is sidewalk construction, so pedestrian needs identified in the TSP must be updated and prioritized, with cost estimates.

- Roadway Functional Classifications and Street Design Standards – review all classifications and street design standards, including street width and sidewalk requirements, to ensure they match the needs of the community and provide for adequate pedestrian facilities. Work with the Oregon Department of Transportation (ODOT) to establish a cross section for Highway 47, considering the Special Transportation Area designation within the downtown.

- Downtown Truck Bypass –review with ODOT the need and feasibility of routing truck traffic around the downtown.

- Rail Crossings – review rail crossing needs with the ODOT Rail Program and update as necessary.

- Capital Improvement Program – update, and develop a Transportation Systems Development Charge (TSDC) for adoption.

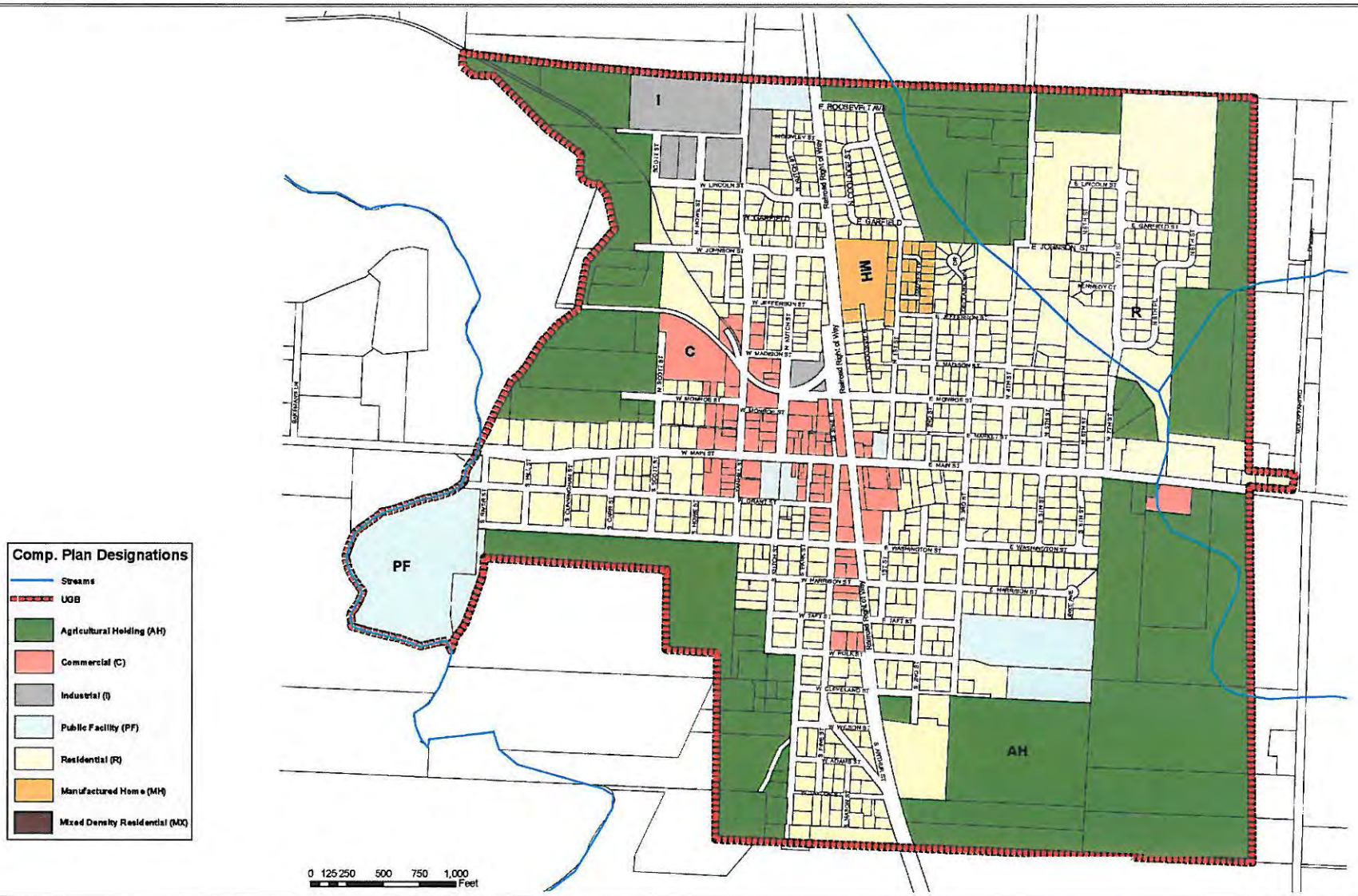
- Safe Routes to School (SRTS) – inventory pedestrian and bicycle facilities within the walk zone of Carlton Elementary School and identify key deficiencies and barriers to students walking or biking to school.

PLANNING AREA

The planning area for the Carlton TSP update is the Carlton Urban Growth Boundary (UGB). The City of Carlton street layout consists of a discontinuous grid pattern. There are only a few north-south and east-west streets that are continuous and provide significant access. Yamhill Street, Kutch Street, Park Street, Pine Street, 3rd Street, 4th Street, and 7th Street are the major north-south travel corridors serving the City. Monroe Street, Main Street, Grant Street, and Polk Street are the primary east-west roads in Carlton.

The primary commercial core area of the City is centered along Main Street. Additional commercial uses are located on Yamhill and Pine streets (along Highway 47). Other common destinations within the planning are include the Carlton Elementary School located on S. 3rd Street and Wenneberg Park located at the west end of Grant Street. A majority of the planning area is served by local streets that provide access for residential areas.

Maps of the current Comprehensive Plan and zoning designations within the planning area are shown in Figures 1-1 and 1-2.



Comprehensive Plan Map

FIGURE 1-1

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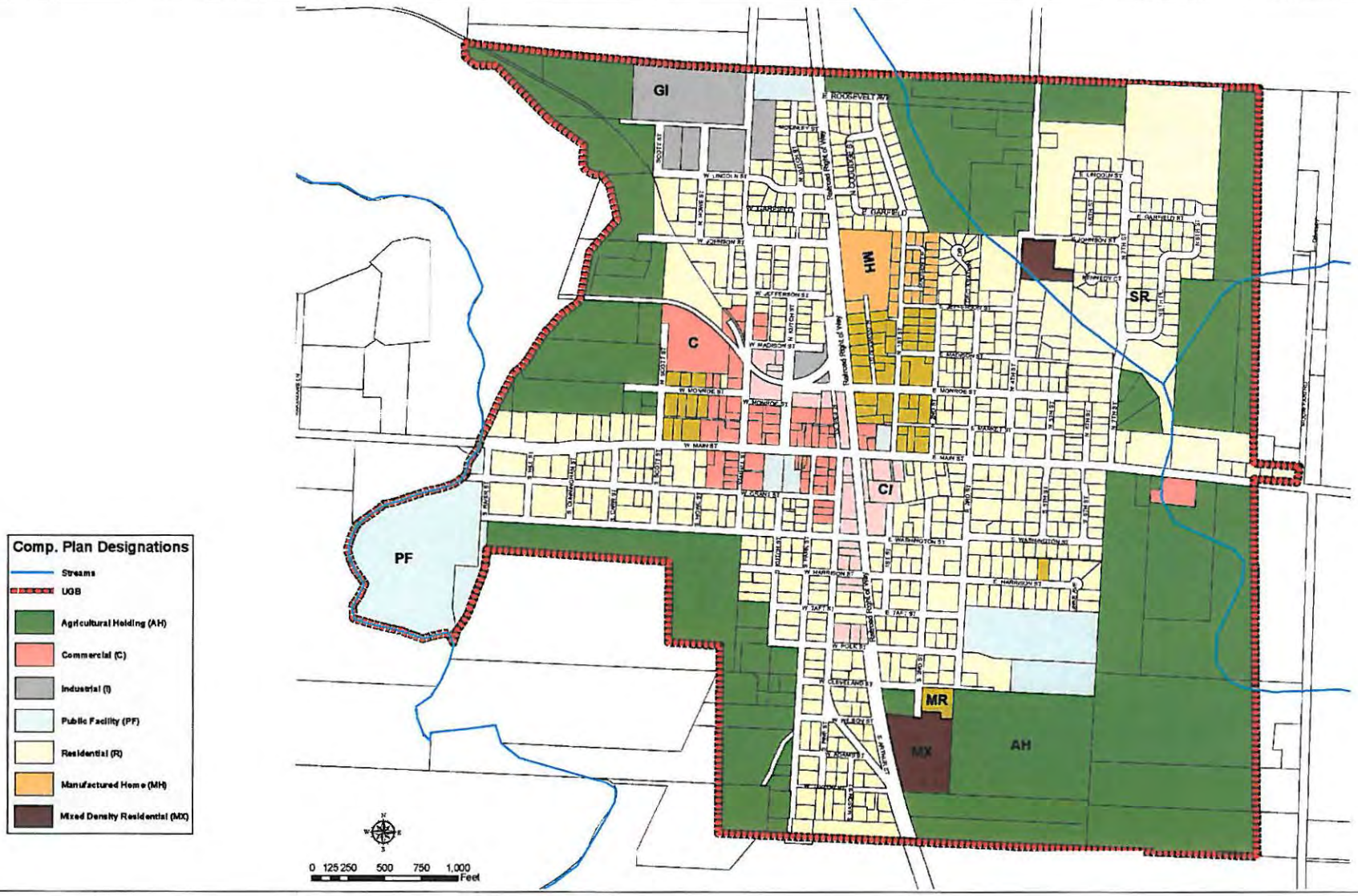

Zoning Map

FIGURE 1-2

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THE PLANNING PROCESS

The 2009 TSP update was prepared with assistance from a Technical Advisory Committee (TAC) and a Citizen Advisory Committee (CAC). The TAC consisted of representatives from the Oregon Department of Transportation (ODOT), Carlton City staff, Yamhill-Carlton School District, Yamhill County Public Works Department, the Department of Land Conservation and Development (DLCD) and project consultant staff from Kittelson and Associates, and the Mid-Willamette Valley Council of Governments. The CAC included three (3) members of the community at large, and representatives from the Carlton City Council and Planning Commission. The TAC and CAC groups reviewed updates to the TSP through a series of committee meetings held over nine (9) months. A public Open House was held on October 22, 2008 to obtain feedback on the Transportation System Plan update and to help prioritize the list of transportation project improvements.

Key elements of the planning process for the TSP update include:

- A review of existing plans, policies and standards (*See Appendix A),*
- An update of the City's transportation goals, objectives and policies,
- An inventory of the transportation system,
- An evaluation of the existing and future transportation system and the identification of transportation needs and deficiencies,
- The development and evaluation of alternatives to address the City's future transportation needs and deficiencies,
- The development of a preferred plan and financially constrained alternative, and
- The development of policy and code revisions to implement the transportation system plan.

Section 2
Transportation Goals, Objectives, and Policies

Transportation Goals, Objectives and Policies

This section includes the City's transportation goals, objectives and policies that provide the overall guidance for the future development of the transportation system. The following goals and policies were developed based upon a review and update of the transportation goals and policies found in the 2007 Carlton Comprehensive Plan and the 1999 Carlton TSP. The City's transportation goals and policies address key transportation issues identified by the community and requirements of the Transportation Planning Rule (TPR).

The following transportation goals, objectives and policies were also used during the TSP planning process to evaluate the transportation alternatives, select a preferred alternative, and prioritize future transportation improvements.

The **overall goal** of the Carlton TSP is to:

> *Develop a balanced multi-modal transportation system that will accommodate future growth in a safe, convenient, and economically feasible manner. In developing the future transportation system of the City of Carlton, the existing character of the city should be preserved.*

This goal is supported by more four (4) related transportation goals. The City's transportation goals are further defined and supported by specific transportation objectives and policies that help guide the future development of the Carlton transportation system. The goals, objectives and policies of the TSP include the following:

Goal 1 - Preserve the function, capacity, level of service, and safety of State Highway 47.

Objectives

A. Maintain and implement access management standards that meet the requirements of the TPR and also consider the needs of the community.

B. Construct an alternate truck route to mitigate current truck impacts through downtown Carlton.

C. Preserve the capacity and function of the state highway by promoting alternative modes of transportation, transportation demand management programs (i.e. ridesharing and park and ride), and transportation system management (TSM) measures.

D. Maintain a volume to capacity ratio of 0.85 or better along Highway 47 and 0.95 within the portion of Highway 47 designated as a Special Transportation Area (STA).

E. Evaluate the need for traffic control devices along Highway 47.

Policies

A. The City shall coordinate all transportation-related activities impacting Highway 47 with the Oregon Department of Transportation.

B. The City shall conform to Oregon Department of Transportation standards and practices with transportation issues concerning Highway 47.

C. The City shall coordinate with the Oregon Department of Transportation on all land use decisions impacting Highway 47.

D. The City shall work with the Oregon Department of Transportation to further refine and implement the Highway 47 transportation improvements identified in the Transportation System Plan.

Goal 2 - Enhance the transportation mobility and safety of the local street system.

Objectives

A. Continue to develop the road system as the principal mode of transportation.

B. Maintain a volume to capacity ratio of 0.85 or better.

C. Maintain and implement the adopted local street plan to preserve future rights-of-way for future streets and to maintain adequate local circulation in a manner consistent with Carlton's existing street grid system.

D. Require developments to construct their accesses consistent with the local street plan.

E. Maintain and implement access management policies for the local arterial, collector and local street system and direct commercial development access to local streets wherever possible.

F. Encourage development to occur near existing community centers where services are presently available to minimize the need for expanding services and to more efficiently utilize existing resources.

G. Work with the Oregon Speed Control Board to examine the need for speed reduction in specific areas such as adjacent to local schools.

H. Identify local traffic problems and recommend solutions.

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

J. Develop and adhere to a transportation improvement program implementing the improvement recommendations of the TSP as funding is identified.

K. Consider the use of reduced street widths and other traffic calming techniques to provide safe passage for pedestrians and bicyclists, and a more livable neighborhood environment for residents.

Policies

A. Approval Processes for Transportation Facilities

The following policies relate to the approval process for transportation facilities:

1. The Transportation System Plan is an element of the City's Comprehensive Plan. It identifies the general location of transportation improvements. When a specific alignment is selected for proposed public road and highway projects it shall be permitted without a plan amendment if the new alignment falls within a transportation corridor identified in the Transportation System Plan.

2. Except where specifically regulated, the operation, maintenance, repair, and preservation of existing transportation facilities shall be allowed without land use review when, under ordinary circumstances they do not have a significant impact on land use.

3. Except where specifically regulated, the dedication of right-of-way, authorization of construction and the construction of facilities and improvements, for improvements designated in the Transportation System Plan, and for improvement that are consistent with clear and objective dimensional standards, shall be allowed without land use review. The classification of the roadway and approval of road standards shall be in accordance with appropriate procedures.

4. Changes in the frequency of transit services that are consistent with the Transportation System Plan and that under ordinary circumstances do not have a significant impact on land use shall be allowed without land use review.

5. For State projects that require an Environmental Impact Study (EIS) or Environmental Assessment (EA), the draft EIS or EA shall serve as the documentation for local land use review, if local review is required.

Where the project is not consistent with the Transportation System Plan, formal review of the draft EIS or EA and concurrent completion of necessary goal exceptions or plan amendments shall occur prior to project commencement.

B. Protection of Transportation Facilities

1. The City shall protect the function of existing and planned roadways as identified in the Transportation System Plan.

2. The City shall include a consideration of the impact of proposed development on existing and planned transportation facilities in all land use decisions.

3. The City shall protect the function of existing or planned roadways and roadway corridors through the application of appropriate land use regulations.

4. The City shall consider the potential to establish or maintain accessways, sidewalks, walkways, paths, and trails prior to the vacation of any public easement or right-of-way.

5. The City shall preserve right-of-way for existing and planned transportation facilities through exactions, voluntary dedication, and setbacks.

6. The City shall coordinate with ODOT and the railroad owners/operators to preserve the railroad right-of-way for future rail service.

7. The review of development applications and associated conditions of approval for right-of-way dedications and street improvements shall consider the impact of the development and rough proportionality through an individual determination.

C. The local street plan in the Transportation System Plan shall be implemented by local developments. The local street plan identifies general alignments of future local streets and maintains a grid system whenever possible. Developers shall be required to follow the local street plan. Flexibility is allowed only as the proposed modifications still meet the integrity of the overall local street plan and circulation objectives.

Any modifications to the local street plan shall be in accordance with the appropriate land use application for the modification proposed. The decision for modification shall be based on the criteria for the appropriate land use application and whether the integrity of the overall local street plan is still met and circulation objectives can still be achieved.

D. Railroad Crossing

In the event a developer is unable to acquire the necessary right-of-way and permission to cross the Union Pacific Railroad right-of-way, for the purposes of street extensions as shown in the City's Transportation System Plan, after good faith attempts, then the City shall consider proceeding to acquire such right-of-way through the exercise of the City's power of eminent domain. The street extension must serve proposed uses which are permitted under the City Zoning Code, and for which preliminary plat approval has been granted if required.

The City shall keep account of time and expenses incurred in acquiring said right-of-way, including court costs, and the developer shall pay all such expenses, together with the amount of judgment or settlement, as a condition of issuance of construction permits. The City may require the posting of a cash bond, or other security acceptable to the City, to cover the estimated costs of the proceeding and costs for compensation to the owner of the railroad right-of-way.

Any settlement of condemnation action must be concurred in by the developer. In the event the developer decides to abandon the development, the developer shall pay to the City all costs incurred in preparing for and prosecuting the condemnation action.

All rights-of-way acquired by the developer, or for the developer, shall be dedicated to the City prior to construction of any street.

Goal 3 - Increase the use of alternative modes of transportation (walking, bicycling, rideshare/carpooling, and transit) through improved access, safety, and service. Increasing the use of alternative transportation modes includes maximizing the level of access to all social, work, and welfare resources for the transportation disadvantaged. The City of Carlton seeks for its transportation disadvantaged citizens the creation of a customer-oriented regionally coordinated public transit system that is efficient, effective, and founded on present and future needs.

Objectives

A. Maintain and implement the Transportation System Plan's pedestrian and bicycle plan providing for sidewalks, bikeways, and safe crossings.

B. Promote alternative modes and rideshare/carpool programs through community awareness and education.

C. Plan for future expanded transit service by coordinating with regional transit service efforts.

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

E. Seek further improvement of mass transit systems to the City of Carlton by encouraging more frequent scheduling of commercial carriers and by continued support of those systems presently developed for mass transit in the region.

F. Transportation Disadvantaged

1. Continue to support programs for the transportation disadvantaged where such programs are needed and are economically feasible.

2. Increase all citizens' transportation choices.

3. Create a customer-oriented focus in the provision of transportation services.

4. Hold any regional system accountable for levels and quality of service.

5. Enhance public transportation sustainability.

6. Promote regional planning of transportation services.

7. Use innovative technology to maximize efficiency of operation, planning, and administration of public transportation.

8. Inter-community and intra-community transportation are equally necessary for the transportation disadvantaged.

Policies

A. Pedestrian and Bicycle Circulation

1. The City shall maintain and implement the Transportation System Plan's network of streets, access-ways, and other improvements, including bikeways, sidewalks, and safe street crossings to promote safe and convenient bicycle and pedestrian circulation within the community.

2. The City shall require streets and access ways where appropriate to provide direct and convenient access to major activity centers, including downtown, schools, shopping areas, and community centers.

3. The City shall maintain and implement the Transportation System Plan's sidewalk improvement plan to develop the pedestrian system. Included within the pedestrian plan is a priority system that shall be followed.

4. Bicycle facilities on local streets shall be shared facilities with general traffic since local street traffic volumes are low and narrow local roads create a hardship in the development of exclusive bike lanes.

5. Retrofitting existing arterials and collectors within the Urban Growth Boundary with bike lanes shall be considered only when deemed appropriate and practical by the City Council.

6. The development of bike lanes shall be considered for all new arterials and collectors within the Urban Growth Boundary. Consideration of the development of bike lanes shall be based on availability of right-of-way and financial ability.

7. Where practicable, bikeways and pedestrian accessways shall connect to local and regional travel routes.

8. Bikeways and pedestrian access ways shall be designed and constructed to minimize potential conflicts between transportation modes. Design and construction of such facilities shall follow the guidelines established by the Oregon Bicycle and Pedestrian Plan.

9. Bicycle parking facilities shall be provided at all new residential multifamily developments of four units or more, commercial, industrial, recreational, and institutional facilities.

10. The City will coordinate with the Yamhill-Carlton School District to develop and promote the use of safe and convenient pedestrian and bicycle facilities to the elementary school and high school bus stops.

B. Transit

1. Supporting the continued operation of existing public transit services is a priority.

2. The City shall support efforts to coordinate with governmental and private agencies in the planning and provision of public transportation services and support a regional program to improve services, particularly for the transportation disadvantaged.

3. The City will cooperate with Yamhill County and other agencies in expanding public transit opportunities, including bus and rail.

4. The City will coordinate with other jurisdictions when the need for park-and-ride facilities is studied.

5. The City will coordinate with local businesses to increase transit and shuttle service and the use of park-and-ride and overflow parking lots during special events such as festivals and peak wine tasting events.

Goal 4 - Improve coordination between the City of Carlton, Yamhill County, and the Oregon Department of Transportation (ODOT).

Objectives

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

B. Encourage improvement of state highways, especially Highway 47.

C. Work with Yamhill County and ODOT in establishing cooperative road improvement programs and schedules.

D. Work to obtain the right-of-way needed for roads identified in the TSP.

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

Policies

A. The City shall coordinate with the Oregon Department of Transportation to implement the highway improvements listed in the Statewide Transportation Improvement Program (STIP) that are consistent with the Transportation System Plan and comprehensive plan.

B. The City shall consider the findings of ODOT's draft Environmental Impact Statements and Environmental Assessments as an integral part of the land use decision-making procedures if the documents are received in a timely manner for review by the City of Carlton. A timely manner shall constitute a minimum time frame of 45 days for review and comment by the City of Carlton. Other actions required, such as a goal exception or plan amendment, will be combined with review of the draft EA or EIS and land use approval process.

Section 3
Existing and Future Conditions

Existing and Future Conditions

Transportation is one of the most important aspects of the economic viability and livability for a city. A city's transportation system is the foundation on which these opportunities are built. The following provides an update to the transportation inventory in the City of Carlton's 1999 Transportation System Plan and includes all elements of the transportation network.

The City of Carlton is situated along Highway 47 approximately three miles north of its intersection with Highway 99W near McMinnville, Oregon and approximately three miles south of Yamhill, Oregon. Carlton has experienced a population increase from 1,300 in 1980 to 1,500 in 1997 to 1,755 in 2007. This increase equates to an annual average growth rate of approximately 1.3%, which has remained fairly constant since 1980. However, Carlton's adopted Comprehensive Plan (2007) projects a population of 2,380 by the year 2027. This equates to a doubling of the historic average growth rate to approximately 1.7% per year, for an increase of approximately 35% between 2007 and 2027.

This section provides a summary of the existing and future transportation system conditions within the City of Carlton, covering the roadway, pedestrian, bicycle, transit, rail, air, water, and pipeline/transmission transportation modes. Each mode's current performance and deficiencies are described. The findings highlight existing and future transportation system deficiencies. These findings, combined with the City's transportation goals and objectives found in Section 2, and the plan/policy review found in *Appendix A*, provide a comprehensive overview of Carlton's anticipated transportation needs.

ROADWAY NETWORK

The City of Carlton is effectively divided into four quadrants by two major arterials. Highway 47 divides the City east and west. Highway 47 enters the City from the south as Pine Street, it makes a series of turns through downtown providing a two-block east-west segment along Main Street, then exits the City to the north as Yamhill Street. Main Street divides the City north and south. West of the city limits, Main Street becomes Meadowlake Road. East of the city limits Main Street becomes Hendricks Road. The collector and local roadway system connecting to the arterial system comprises a well established grid; however, it has many east-west discontinuities due to the presence of a Union Pacific Railroad right-of-way that runs north and south through the City to the east of Highway 47. There are only four crossings of the railroad right-of-way within the City. They are located at Lincoln Street, Main Street, Monroe Street, and Polk Street. Figure 3-1 shows the existing roadway network and functional classification for the roadways.

The existing street system inventory was conducted for all roadways within Carlton and was documented in the Roadway Inventory. The inventory elements included:

- street classification and jurisdiction
- street width and right-of-way
- number of travel lanes

- presence of on-street parking, sidewalks, or bikeways
- speed limits; and
- general pavement conditions

Appendix B includes the complete roadway inventory.

Jurisdiction

Public roads within the study area are maintained by three different jurisdictions: the City of Carlton, Yamhill County, and the Oregon Department of Transportation (ODOT). ODOT is responsible for Highway 47 and the City of Carlton is responsible for all other roadways within the city limits with the exception of portions of Main Street. Highway 47 remains under ODOT jurisdiction beyond the city limits. Main Street changes jurisdiction to Yamhill County west of Cunningham Street and east of 6th Street.

Coordination is required between ODOT, Yamhill County, and the City of Carlton to ensure that any new projects that are constructed benefit the transportation system as a whole.

Functional Classification

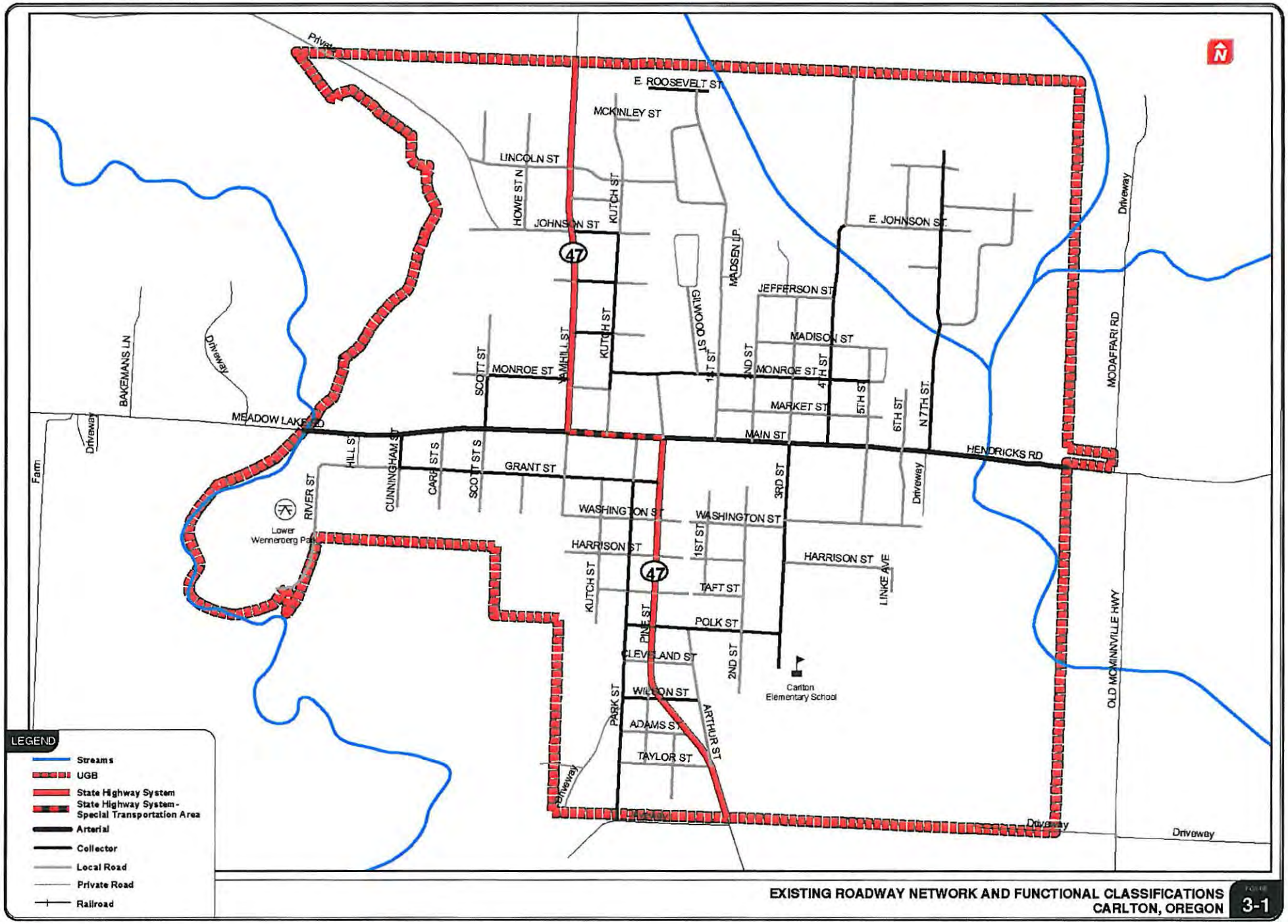
Identification of the roadway appropriate functions is the basis for planning roadway improvements and establishing appropriate standards (right-of-way, roadway width, design speed). The existing roadway functional classifications are shown in Figure 3-1. As shown in Figure 3-1, the city has arterial, collector, and local roadways. The arterial roadways include the following:

- Main Street from eastern city limit to western city limit
- Pine Street (along Highway 47 only)
- Yamhill Street (along Highway 47 only)

These roadways help provide access to the commercial/business district in the center of town.

The following collectors exist within the Carlton urban growth boundary (UGB):

- Johnson Street from Yamhill Street to Kutch Street
- Jefferson Street from Yamhill Street to Kutch Street
- Madison Street from Yamhill Street to Kutch Street
- Monroe Street from Scott Street to 5th Street
- Cunningham Street from Grant Street to Main Street
- Scott Street from Main Street to Monroe Street
- Grant Street from Cunningham Street to Pine Street
- Kutch Street from Johnson Street to Monroe Street
- 3rd Street from southern terminus to Main Street



EXISTING ROADWAY NETWORK AND FUNCTIONAL CLASSIFICATIONS
CARLTON, OREGON

FIGURE 3-1

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

- 4th Street from Main Street to Johnson Street
- 7th Street from Main Street to northern terminus
- Park Street from south UGB to Grant Street
- Polk Street from Park Street to 3rd Street
- Roosevelt Street from western terminus to 1st Street

The collector roadways help provide access to two significant local destinations within the UGB. These include the public elementary school, which is located in the southeast quadrant of the City and accessed by the Polk Street and 3rd Street collectors, and Lower Wennerberg Park, which is located in the southwest quadrant of the city and is accessed by Grant Street.

Pine Street, Main Street, and Yamhill Street along Highway 47 also have an ODOT roadway classification. The Oregon Highway Plan identifies Highway 47 as a *Regional Highway.* Along Main Street from Yamhill Street to Pine Street, Highway 47 has a *Special Transportation Area* designation. A Special Transportation Area (STA) is a highway segment designation that may be applied when an existing downtown or planned downtown business district or community center straddles the state highway in existing or certain planned urban centers. The primary objective of an STA is to provide access to community activities, businesses and residences and to accommodate pedestrian, bicycle and transit movement along and across the highway in a downtown, business district or community center. While traffic moves through an STA and automobiles may play an important role in accessing an STA, convenience of movement within an STA is focused upon pedestrian, bicycle and transit modes.

Streets in the STA are designed for ease of crossing by pedestrians. Public road connections are preferred over private driveways and parking is generally located on street or in shared parking lots located behind or to the side of buildings. Sidewalks are often wider to provide ample width for heavier pedestrian use and located adjacent to the highway and the adjacent buildings.

Functional Classification Changes

Based on the connectivity they provide and relationship to access and railroad right-of-way crossings, the following facilities were identified for upgrade from local street to collector classification:

- 1st Street from Roosevelt Street to Main Street
- Kutch Street from Johnson Street to Roosevelt Street
- Kutch Street from Main Street to Monroe Street
- Johnson Street from 4th Street to 7th Street

Existing Traffic Operations

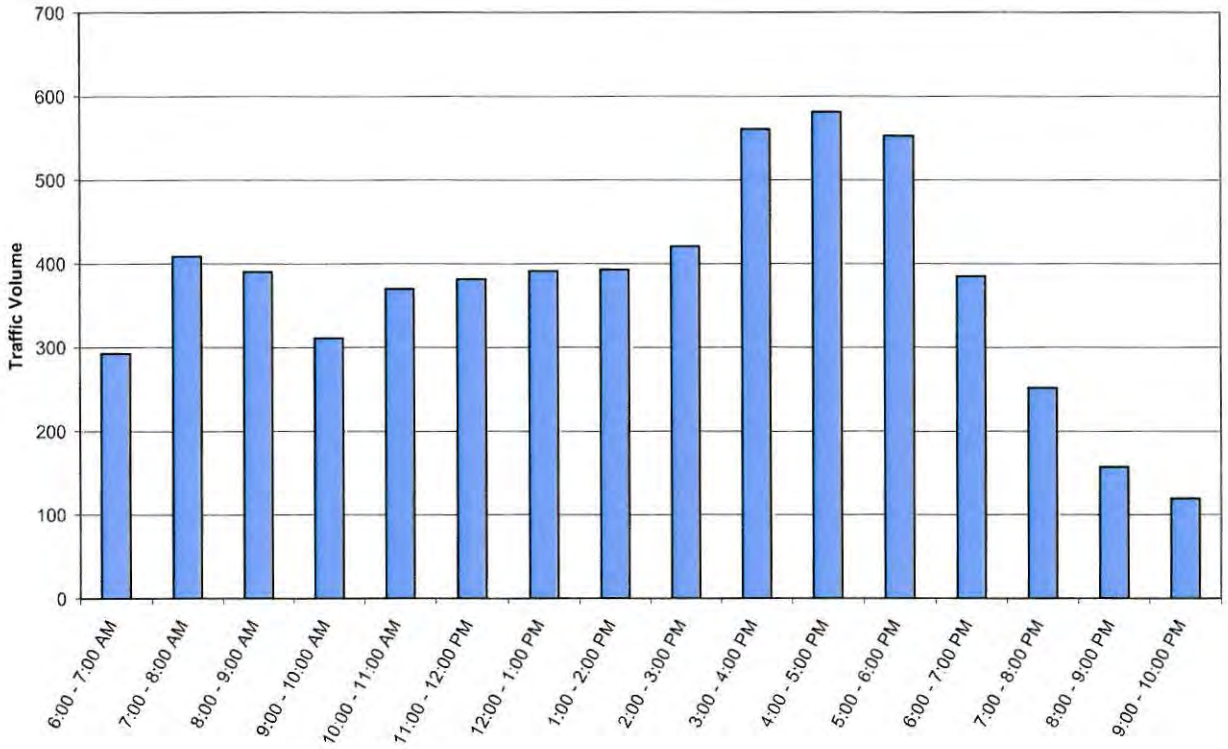
As part of the planning process, the current operating conditions for the transportation system were evaluated. Sixteen-hour turning movement traffic volumes were collected on a weekday in October 2007 at the following study area intersections:

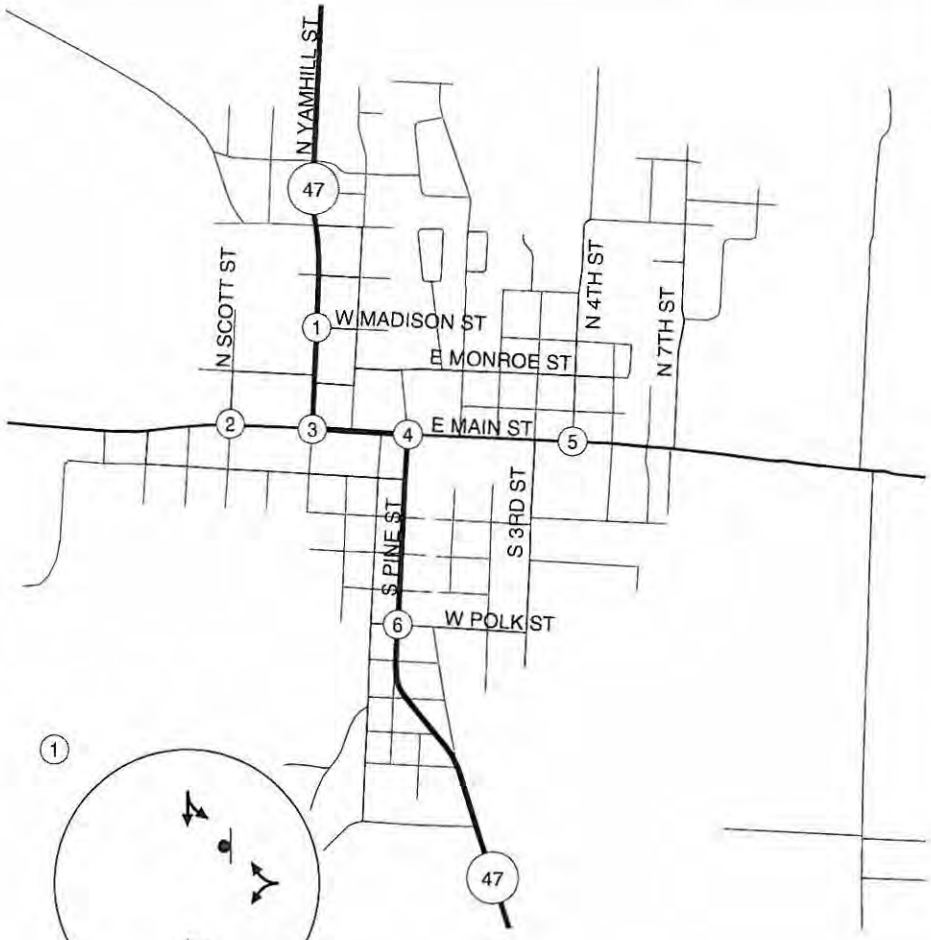
- Highway 47 (Yamhill Street)/Madison Street
- Main Street/Scott Street
- Highway 47 (Yamhill Street)/Main Street
- Main Street (Highway 47)/Pine Street (Highway 47)
- Main Street/4th Street
- Highway 47 (Pine Street)/Polk Street

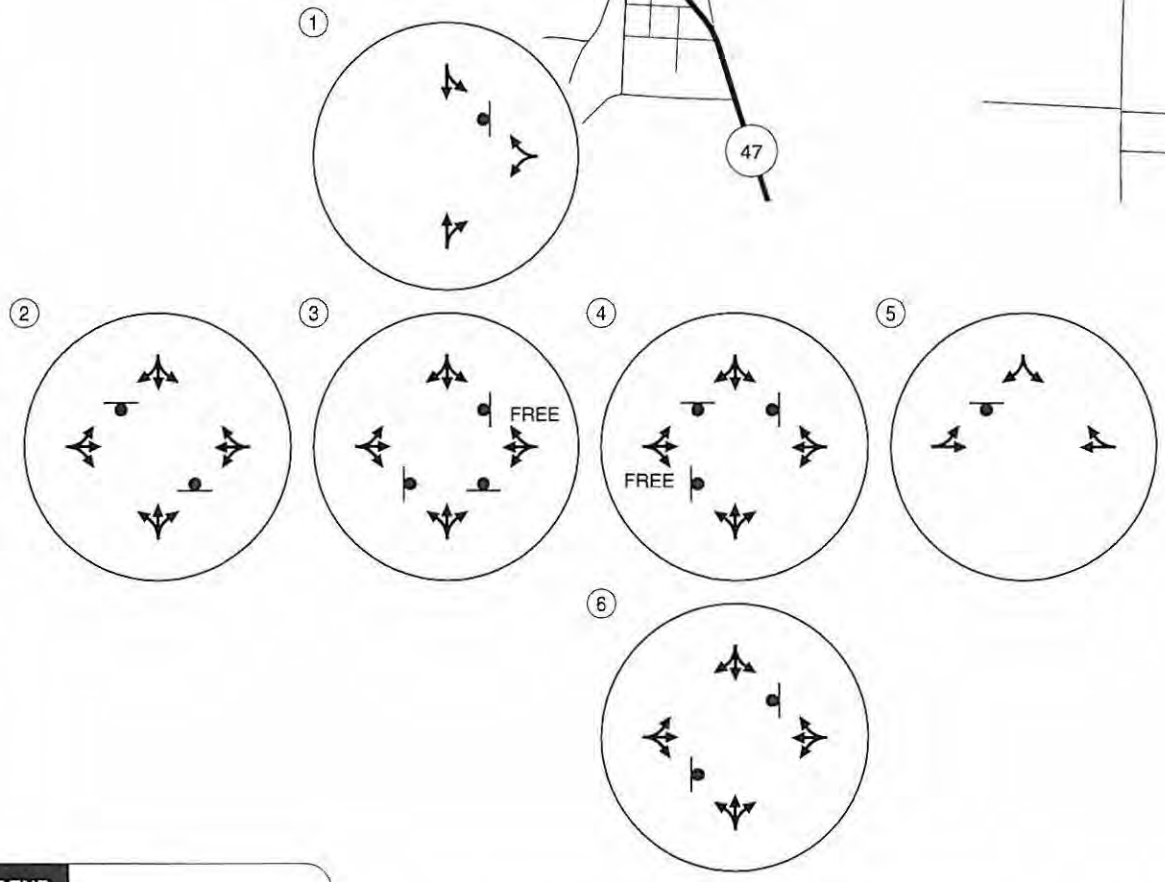
The study intersections generally represent major intersections and intersections adjacent to land uses generating a significant amount of traffic. The existing lane configurations and traffic control for these intersections were inventoried in April 2008 and are shown in Figure 3-2.

The sixteen-hour traffic counts indicate that the weekday peak hour occurs between 4:45 p.m. and 5:45 p.m. Chart 3-1 illustrates the daily traffic profile along Main Street in downtown Carlton. The existing weekday p.m. peak hour traffic volumes at each of the study intersections are shown in Figure 3-3. These volumes have been seasonally adjusted according to the procedures defined in the ODOT Analysis Procedures Manual, which is described in the methodology memo. *The methodology memo is included in Appendix C.* As shown in Figure 3-3, the majority of traffic is located on Highway 47 and Main Street. Side street traffic is minimal. *The sixteen-hour traffic counts and summaries are provided in Appendix D.*

Chart 3-1 Average Daily Traffic (Main Street from Yamhill to Pine)







LEGEND

- STOP SIGN
- TRAFFIC SIGNAL

FREE - RIGHT TURNS PERMITTED WITHOUT STOPPING

EXISTING LANE CONFIGURATIONS & TRAFFIC CONTROL DEVICES CARLTON, OREGON

FIGURE 3-2

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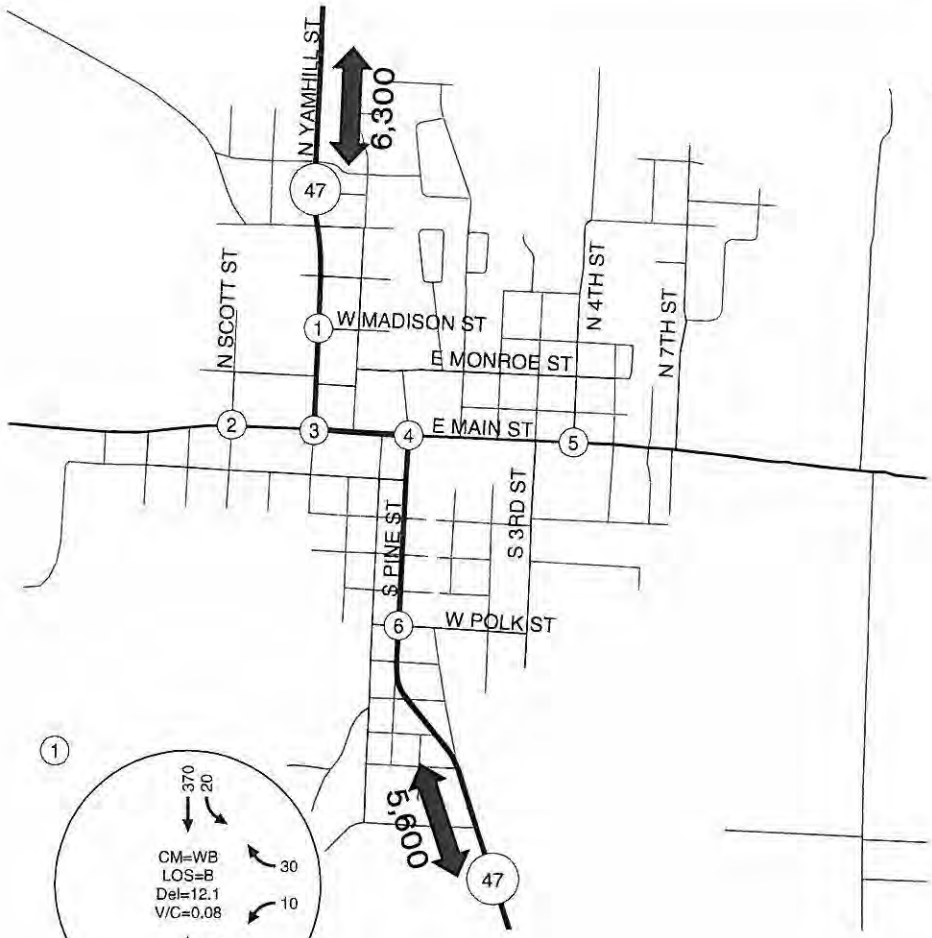
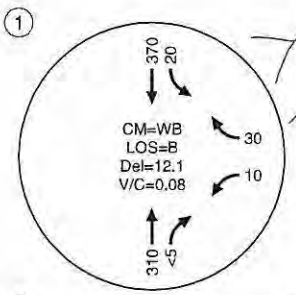
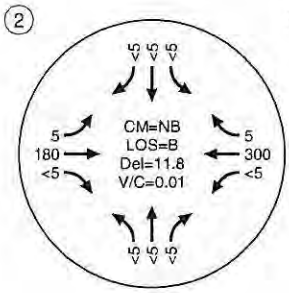
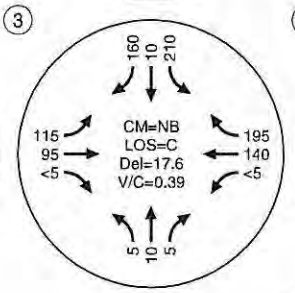
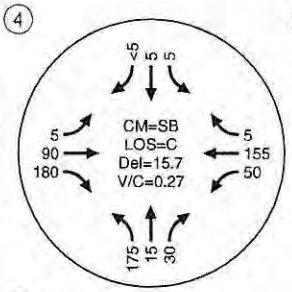
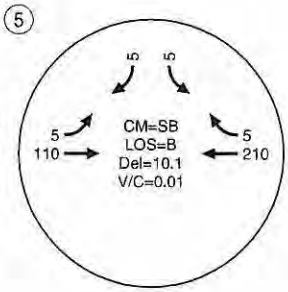


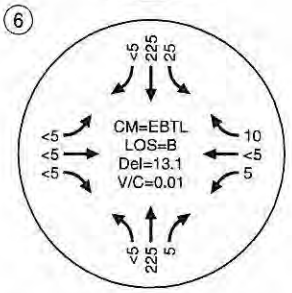












LEGEND

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

XXX - TWO-WAY AVERAGE DAILY TRAFFIC

2007 EXISTING TRAFFIC OPERATIONS
PM PEAK HOUR
CARLTON, OREGON

FIGURE **3-3**

Existing Intersection Operations

Traffic operations at intersections are generally described using a measure known as "level of service" (LOS). Level of service represents ranges in the average amount of delay that motorists experience when passing through the intersection. LOS is measured on an "A" (best) to "F" (worst) scale. At signalized and all-way stop-controlled intersections, LOS is based on the average delay experienced by all vehicles entering the intersection. At two-way stop-controlled intersections, LOS is based on the average delay experienced by the worst movement at the intersection, typically a left-turn from the stop-controlled street. For signalized intersections, LOS "D" (representing no more than 55 seconds of average delay) is generally considered to be the minimum acceptable operational level. For unsignalized intersections, LOS "E" (representing no more than 50 seconds of average delay) is generally considered to be the minimum acceptable level.

ODOT uses a different criterion for intersections under its jurisdiction (e.g. Highway 47), based on the roadway's classification and the volume-to-capacity (v/c) ratio of signalized intersections located along its length. The v/c ratio indicates the percentage of an intersection's or movement's capacity that is being used. For example, a v/c ratio of 0.50 indicates that half of the available capacity is used. As stated previously, Highway 47 is designated by ODOT as a *Regional Highway* throughout the city limits and as a *Special Transportation Area* along Main Street. As such, to meet ODOT performance standards, the volume-to-capacity ratio at intersections located along Highway 47 should not exceed 0.80 or 0.95 within the STA.

All of the operational analyses described in this report were performed in accordance with the procedures stated in the 2000 Highway Capacity Manual (Reference 1) and the ODOT Analysis Procedures Manual (Reference 2).

Existing Level of Service

Based on current p.m. peak hour traffic volumes, level of service was calculated for the study area intersections and roadway mid-blocks. The results of the unsignalized intersection level of service analysis are summarized in Table 3-1.

Table 3-1 Intersection Operations Analysis Results

Intersection	Traffic Control	Standard	Weekday PM Peak Hour			Meets Standard
			LOS	V/C Ratio	Delay (sec/veh)	
N Yamhill Street / W Madison Street	One-way Stop	0.80	B	0.08	12.1	Yes
W Main Street / N Scott Street	Two-way Stop	NA[3]	B	0.01	11.8	Yes
N Yamhill Street / W Main Street	Three-way Stop[1]	0.95	B	0.39	17.6	Yes
S Pine Street / W Main Street	Three-way Stop[2]	0.95	C	0.27	15.7	Yes
E Main Street / N 4th Street	One-Way Stop	NA[3]	C	0.01	10.1	Yes
S Pine Street / W Polk Street	Two-way Stop	0.80	B	0.01	13.1	Yes

Notes: LOS = Level of Service, V/C Ratio = Volume-to-Capacity Ratio
Intersection LOS and V/C ratio for unsignalized intersection represent operations of critical movement only.
[1] All southbound movements and the westbound right-turn traffic uncontrolled; all other movements stop-controlled
[2] All northbound and the eastbound right-turn traffic uncontrolled; all other movements stop-controlled
[3] This intersection is under City jurisdiction and had no adopted standard

As shown in Table 3-1, all of the study area intersections operate at LOS C or better during the weekday p.m. peak hour. The LOS C or better rating at all of the study intersections and low v/c ratios indicate that the roadway network operates acceptably within the City of Carlton. *Appendix E provides the Existing Conditions operational analysis worksheets for each study intersection.*

Although the level of service analysis did not show any congestion problems with Carlton, the public opinion survey conducted for the 1999 transportation system plan (TSP) identified that 42 percent of the public felt that heavy traffic congestion exists on Main Street, Yamhill Street, and Pine Street. However, Main Street has pedestrian amenities such as wide sidewalks, curb extensions and pedestrian crosswalks. Field observations indicated high compliance by drivers of pedestrians near the crosswalks.

Truck movements along Highway 47 through the City were also identified as a major concern. Trucks have a difficult time negotiating the Yamhill Street/Main Street and Pine Street/Main Street intersections and create safety concerns by encroaching on both the approaches and departures of the intersections. Also, the truck traffic through downtown Carlton creates a negative impact and safety concerns to pedestrians. Truck traffic through downtown is discussed in more detail in the following sections.

Queue Length Analysis

A queue length analysis was conducted for each of study intersections according to the method described in the APM. By applying the Two-Minute Rule, 95th-percentile queue lengths were identified for each approach. The Two-Minute Rule, intended for two-way stop controlled intersections, suggests unrealistic queue lengths for some of the approaches at the two downtown intersections. Therefore, the queue length reported in SIDRA (the analysis software used to evaluate the three-way stop controlled intersections) was also reviewed. The reported queue lengths are shown in Table 3-2.

Table 3-2 Queue Length Analysis (2007)

Intersection	Approach	95th-Percentile Queue Length (feet)		Queue Storage Available (feet)	Adequate Storage?
		2-Minute Rule	SIDRA[1]		
N Yamhill Street/ W Madison Street	Southbound	50		250	Yes
	Westbound	25		225	Yes
W Main Street / Scott Street	Northbound	25		250	Yes
	Southbound	25		325	Yes
	Eastbound	25		275	Yes
	Westbound	25		500	Yes
N Yamhill Street / W Main Street	Northbound	25	25	250	Yes
	Southbound	325	None	275	Yes[2]
	Eastbound	200	75	525	Yes
	Westbound	0	125	200	Yes
S Pine Street / W Main Street	Northbound	275	None	250	Yes[2]
	Southbound	25	25	400	Yes
	Eastbound	25	50	300	Yes
	Westbound	75	50	250	Yes
E Main Street / N 4th Street	Southbound	25		175	Yes
	Eastbound	25		225	Yes
S Main Street / W Polk Street	Northbound	25		200	Yes
	Southbound	50		200	Yes
	Eastbound	25		150	Yes
	Westbound	25		200	Yes

[1] The two downtown three-way stop-controlled intersections were also analyzed using the SIDRA software as the Two-Minute Rule does not accurately estimate queues for these configurations.

[2] This approach is uncontrolled and queues are not expected.

As shown in Table 3-2, the anticipated 95th-percentile queue lengths for each approach at the Main Street intersections are less than their respective available storage. *Queuing analysis calculations are provided in Appendix F.*

Existing Segment Operations

Existing average daily traffic volumes were obtained from ODOT's *2006 Traffic Volume Tables* and factored by a 1.4 percent per year historical growth rate to obtain 2008 daily traffic volumes. The growth rate was calculated according to historic traffic volumes and is detailed in the attached methodology memo. These daily traffic volumes are also shown in Figure 3-3. As shown, the average daily traffic volumes on Highway 47 range from 5,600 to 6,800 vehicles per day (vpd) in the Carlton urban growth boundary. This small range in daily traffic volumes along the entire highway

alignment through town indicates that a significant amount of traffic through Carlton is generated outside the city limits. Table 3-3 identifies the traffic operations along Highway 47.

Table 3-3 Existing Roadway Segment Traffic Operations Summary (Highway 47)

Roadway	Location	AADT	Weekday PM Peak Hour Peak Direction	Peak Hour Peak Directional Volume[1]	Directional Capacity	Peak Hour V/C Ratio
Highway 47	North City Limits	6,300	Southbound	470	1,700	0.28
	North of Main Street	6,800	Southbound	450	1,700	0.26
	South of Main Street	5,800	Southbound	280	1,700	0.16
	South City Limits	5,600	Southbound	250	1,700	0.15

AADT – Average Annual Daily Traffic
V/C Ratio – Volume-to-capacity ratio
[1] Peak Hour Volumes represent peak direction hourly volumes adjusted for a peak 15-minute analysis and heavy vehicles

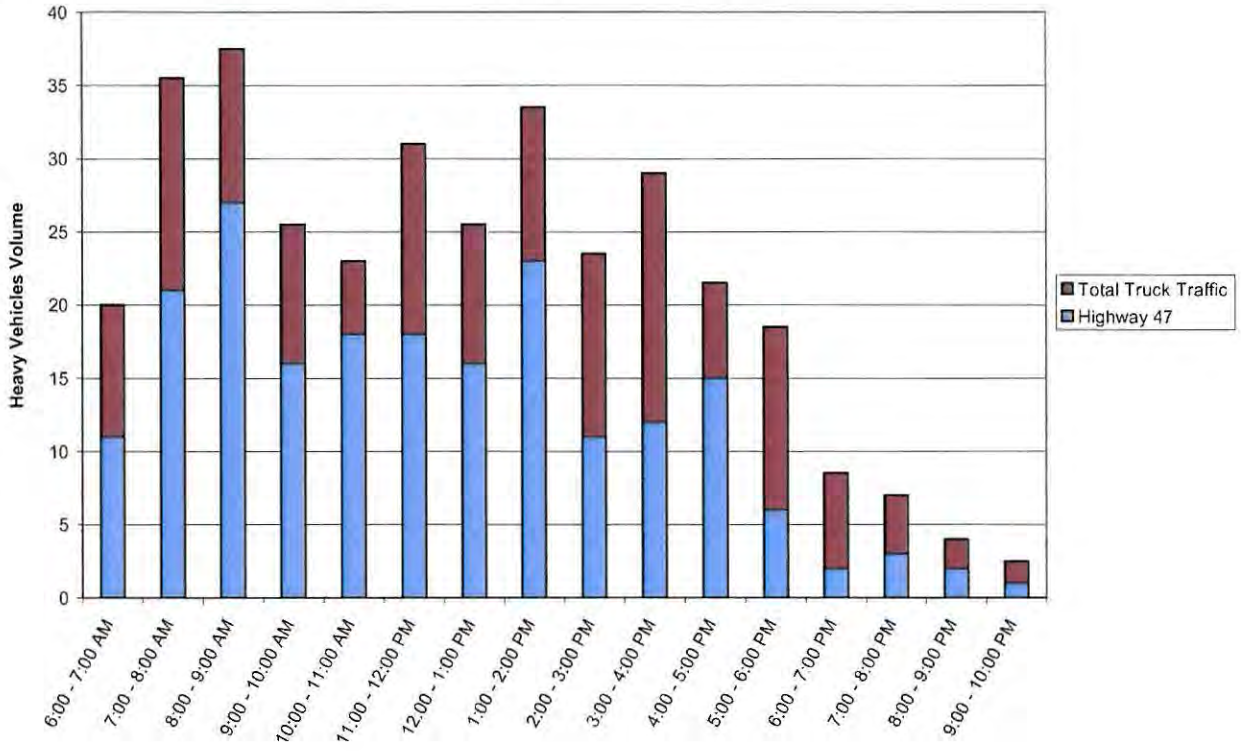
As shown in Table 3-3, the segments along Highway 47 operate well below capacity during the p.m. peak hour.

Truck Traffic

Although not apparent in the traffic analysis, truck traffic traveling through downtown Carlton can cause significant delay and disruption. Chart 3-2 illustrates an hourly profile of truck traffic on Main Street in downtown Carlton between N. Yamhill Street and S. Pine Street[1].

[1] All truck traffic data is based on raw data that has not been seasonally adjusted. The traffic counts were collected in early October, very near to the seasonal peak for Agricultural facilities such as Highway 47. The seasonal adjustment factor for the traffic volumes is 2.5%. The actual seasonal peak for trucks at this specific location is unknown and may be influenced by timber and/or grape harvest peaks.

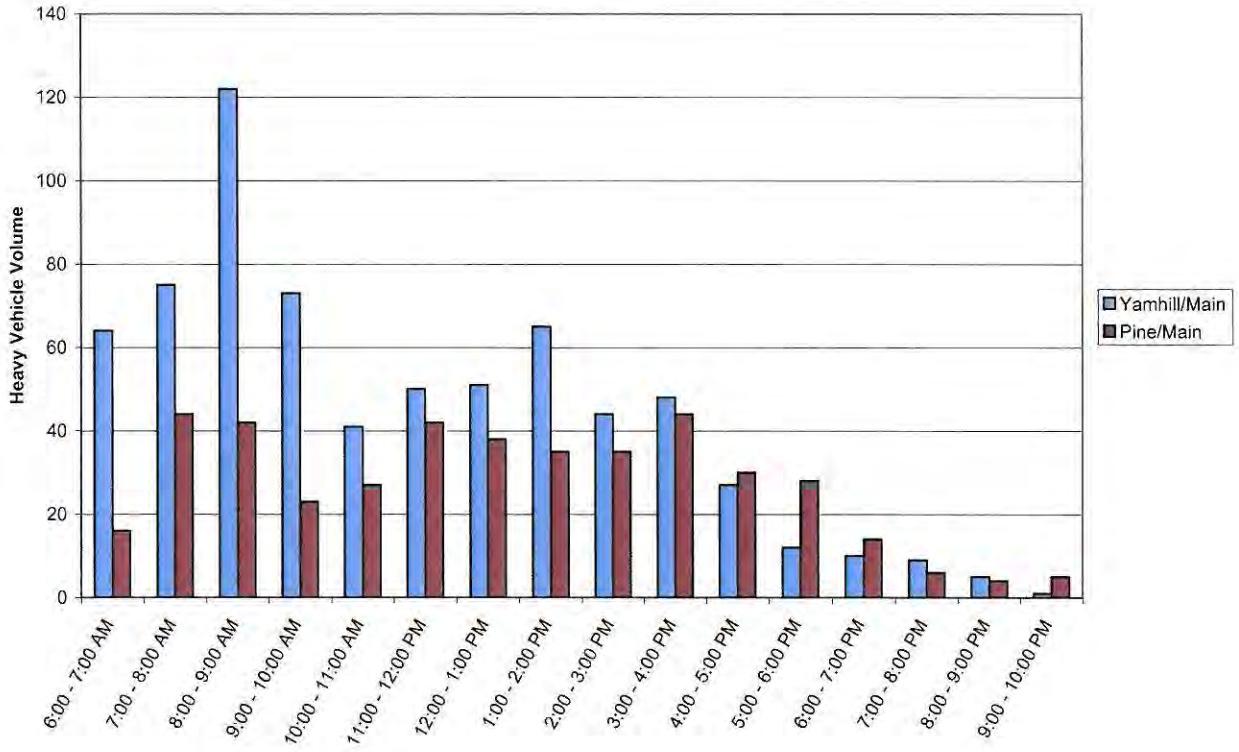
Chart 3-2 Heavy Vehicle Profile (Main Street from Yamhill to Pine)



As shown in Chart 3-2, truck traffic is relatively constant throughout the course of the day, peaking during in the morning between 8:00 and 9:00 a.m. when nearly 38 trucks – or one every 1.5 minutes – were counted traveling along Main Street. Based on the truck turning movements at each intersection, it is estimated that approximately 27 of the Main Street trucks enter and exit Main Street from Highway 47. The truck turning movement counts also indicated that some of the Main Street heavy vehicles were entering and entering Main Street between the two Highway 47 intersections.

In addition, truck traffic at each of the downtown intersections was analyzed for the same sixteen-hour time period. Chart 3-3 illustrates the total truck volume entering the N. Yamhill Street/W. Main Street and S. Pine Street/E. Main Street intersections.

Chart 3-3 Heavy Vehicle Profile (Main Street Intersections)



As illustrated in Chart 3-3, both downtown Main Street intersections experience high volumes of truck traffic throughout the day. While Main Street has approximately forty trucks during the a.m. peak hour, the Yamhill Street/ Main Street intersection has approximately 120 trucks and the Pine Street/Main Street intersection has approximately 40 trucks. The higher truck volumes at the Yamhill Street/Main Street intersection indicate that many trucks travel to and from the north and west legs of that intersection. The Pine Street/Main Street intersection also has some truck traffic that travels to and from the south and east legs of the intersection. A downtown truck bypass would only help reduce the truck traffic volumes through downtown that currently travel through Carlton along Highway 47 (as indicated by the "Highway 47" designation in Chart 3-2), and have little to no effect on the other travel patterns.

Safety Evaluation

To determine whether safety deficiencies or potential conflict points exist within the study area, crash data collected by ODOT was examined. This examination was completed through a preliminary review of the most recent five years of crash data for each of the study intersections. The crash data were reviewed at the intersection level in order to identify potential safety issues that should be addressed at each of the study intersections.

Review of Crash Data

Detailed crash data was obtained from ODOT for the five-year period from January 1, 2002 to December 31, 2006 for each of the study intersections. Typically, intersection safety is evaluated by

calculating a crash rate (the number of crashes per million entering vehicles (MEV)) and the frequency of crashes (number of crashes per year) and comparing it to rates of other similar facilities. The crash frequency, typical crash patterns, and other characteristics are used to further evaluate whether a safety deficiency exists. Additional examination is particularly necessary when crashes of a particular type recur, pedestrians or bicyclists are involved, a high proportion of crashes result in injuries, or one or more fatalities occur.

Results of Preliminary Safety Evaluation

Based on the most recent five years of crash data, crash rates and frequencies were calculated as shown in Table 3-4 and Table 3-5, for intersection and segment analysis, respectively. It should be noted, however, that motorists might not report some crashes or the property damage limit may not have been exceeded to classify the crash. Therefore, not all crashes that occur at an intersection may show up in the data.

Table 3-4 Study Intersection Crash Rates (2002-2006)

Intersection Name	Crashes	Freq	TEV	ADT	MEV	Rate
N Yamhill Street / W Madison Street	0	0.00	740	7,400	13.51	0.00
W Main Street / N Scott Street	0	0.00	490	4,900	8.94	0.00
N Yamhill Street / W Main Street	3	0.60	945	9,450	17.25	0.17
S Pine Street / W Main Street	2	0.40	715	7,150	13.05	0.15
E Main Street / N 4th Street	1	0.20	340	3,400	6.21	0.16
S Pine Street / W Polk Street	0	0.00	495	4,950	9.03	0.00

Freq – Crash frequency (crashes per year)
TEV – Total Entering Vehicles
ADT – Average Daily Traffic
MEV – Million Entering Vehicles
Rate – Crashes per MEV

Table 3-5 Highway 47 Segment Crash Rates (2002-2006)

Roadway	From	To	Crashes	Distance (miles)	ADT	MEV	Rate
Yamhill St	North City Limits	Main Street	4	0.49	6,800	12.4	0.66
Main St	Yamhill Street	Pine Street	9	0.14	5,800	10.6	6.07
Pine St	Pine Street	South City Limits	4	0.53	5,600	10.2	0.74
Total			**17**	**1.16**	**6,000**	**10.9**	**1.32**

ADT – Average Daily Traffic
MEV – Million Entering Vehicles
Rate – Crashes per million vehicle miles traveled

Table 3-4 and Table 3-5 indicate crash rates for each study intersection and segment along with the total number of reported crashes and total number of entering vehicles at each location. ODOT classifies Highway 47 as a Rural City Highway through Carlton. The statewide average crash rate for such facilities is 1.04 crashes per million vehicle miles traveled. As shown in Table 3-5, the segments of Highway 47 north and south of Main Street have a crash rate below the statewide

average. The crash rate for all of Highway 47 within Carlton is 1.32, or slightly higher than the statewide average. However, the relatively high number of incidents on the very small section of Main Street caused that segment's crash rate to be very high. Table 3-4 indicates that five of the nine crashes along Main Street are related to the two intersections, which are primarily responsible for the high segment crash rate, but the intersections still have relatively low crash rates.

A review of ODOT's Safety Priority Index System (SPIS) was also completed. The SPIS is a method developed by ODOT for identifying high crash locations on state highways. No locations within the City of Carlton have been identified on ODOT's SPIS list.

Table 3-6 and Table 3-7 provide additional detail about the crash history at each of the study intersections, including the crash type and severity of the collision. *Appendix G contains the crash data.*

Table 3-6 Intersection Crash Type and Severity (2002-2006)

Intersection Name	No. of Crashes	Collision Type					Severity	
		Rear-End	Turning	Angle	Head-On	Other	Property Damage Only	Injury
N Yamhill Street / W Madison Street	0	0	0	0	0	0	0	0
W Main Street / N Scott Street	0	0	0	0	0	0	0	0
N Yamhill Street / W Main Street	3	1	1	1	0	0	3	0
S Pine Street / W Main Street	2	0	1	0	1	0	2	0
E Main Street / N 4th Street	1	0	0	0	0	1	1	0
S Pine Street / W Polk Street	0	0	0	0	0	0	0	0
Total	**6**	**1**	**2**	**1**	**1**	**1**	**6**	**0**

Table 3-7 Highway 47 Crash Type and Severity (2002-2006)

Roadway	From	To	No. of Crashes	Collision Type				Severity	
				Rear-End	Parking	Turning	Fixed/ Other	Property Damage Only	Injury
Yamhill St	North City Limits	Main Street	4	2	0	0	2	1	3
Main St	Yamhill Street	Pine Street	9	1	1	4	3	9	0
Pine St	Pine Street	South City Limits	4	0	0	1	3	3	1
Total			**17**	**3**	**1**	**5**	**8**	**13**	**4**

The majority of the crashes identified in the crash data are related to or between the two Highway 47 intersections on Main Street in downtown Carlton. Four of the nine crashes identified along Main Street at or between the two Highway 47 intersections involved trucks. According to discussion with local stakeholders, the two main causes for the majority of crashes in that area are driver confusion and truck navigation issues. Drivers on Highway 47 passing through Carlton are

often unfamiliar with the unique traffic control through downtown and may not behave appropriately. Such confusion has a higher potential to cause a collision.

The other common cause of collisions relates to the difficulty trucks have in successfully navigating the two Highway 47 turns at Main Street. According to City residents, trucks often miscalculate the turn and must stop and back up in order to get through one or both of the intersections. The proposed truck bypass would eliminate or reduce this problem.

Future Traffic Operations

The following section describes the anticipated future growth in travel demand and how the system is anticipated to operate with the additional traffic. Future traffic operations were conducted in accordance with the Cumulative Analysis Procedure identified in the ODOT Analysis Procedures Manual (APM). *The details of this methodology and additional information on the forecasts are contained in the methodology memorandum included in Appendix C.*

Transportation Improvements

There are no capacity increasing projects currently planned within the study area. There is a pavement preservation project planned for Highway 47 that starts approximately 2.9 miles north of the city limits and extends to the southern city limit. Within the city limits the project will include a four inch pavement inlay. The Main Street section will be rebuilt down to the base and receive a 12 inch base with 8 inches of asphalt concrete. There are no pedestrian or bicycle improvements anticipated as part of this project. The total project cost estimate is $2,900,000. ODOT's current Statewide Transportation Improvement Program (STIP) allocated funds for preliminary engineering for this project. Construction of the project is anticipated to be in the next STIP with construction anticipated in 2013 - 2014.

Population and Employment Growth

Future transportation demand within the City of Carlton was estimated based on estimates published in the 2007 Update of the Carlton Comprehensive Plan. The report reviewed historic trends and projected population and employment to a forecast year of 2027. A straight line projection was used to increase this growth from 2027 to 2030. Table 3-8 and Table 3-9 illustrate the resultant employment and population growth assumptions.

Table 3-8 Employment Growth Projections (2005-2030)

Sector	2005	2007[1]	2027	2030	Growth (2007-2030)
Agriculture, Forestry, Fishing & Hunting	237	245	321	332	87
Construction	82	85	111	115	30
Manufacturing	187	193	254	263	70
Wholesale Trade, Transportation, and Warehousing	63	65	86	89	24
Retail Trade	31	32	42	44	12
Finance and Insurance	18	19	24	25	6
Services and Real Estate	157	162	213	221	59
Public Sector Employment	14	14	19	20	6
Total	**789**	**815**	**1,070**	**1,108**	**294**

1 – Estimates based on straight-line projection between 2005 and 2027 data

Table 3-9 Population and Housing Growth Projections (2007-2030)

	2007	2027	2030	Growth (2030-2007)
Population	1,670	2,379	2,485	815
Housing Units	673	906	941	268

The 2007 Comprehensive Plan for the City of Carlton, estimates that 25 percent of new housing units will be multi-family units and 75 percent will be single-family units. As shown in Table 3-8 and Table 3-9, an increase of 294 jobs and 268 housing units (202 single-family/66 multi-family) are anticipated within the City of Carlton between 2007 and 2030.

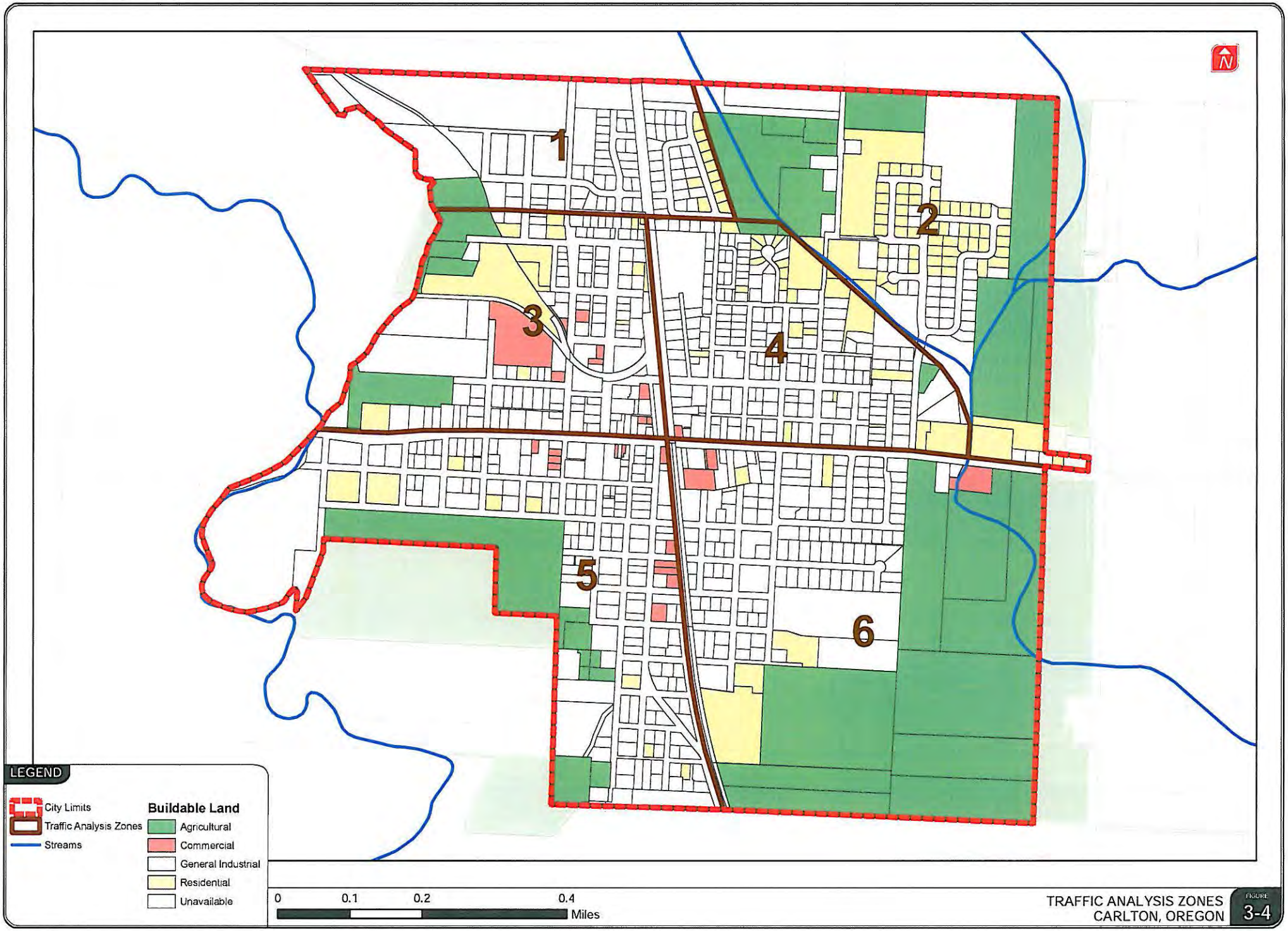
Traffic Analysis Zones

In order to evaluate the impacts of the anticipated growth in the City, the employment and housing growth was assigned to the traffic network according to Traffic Analysis Zones (TAZs) established as part of the TSP. The TAZ boundaries are intended to aggregate areas that have common access to major transportation facilities. Figure 3-4 illustrates the TAZs for Carlton.

The estimates in Table 3-10 were generated based on a review of existing land use and vacant lots in the City. Housing growth was distributed to the TAZs according to the amount of available vacant residential land. Employment growth was similarly distributed according to the available land within each respective land use.

Table 3-10 2030 Population and Employment Growth by TAZ

	Growth Sector	TAZ						Total
		1	2	3	4	5	6	
Housing	Single Family	15	84	20	30	14	38	202
	Multifamily	-	15	5	-	-	46	66
Employment	Agriculture	5	15	39	-	13	15	87
	Construction	30	-	-	-	-	-	30
	Manufacturing	70	-	-	-	-	-	70
	Trade/Transportation	24	-	-	-	-	-	24
	Retail Trade	-	-	4	-	4	4	12
	Finance/Insurance	-	-	3	-	3	-	6
	Services and Real Estate	-	-	29	-	15	15	59
	Public Sector	-	-	-	-	6	-	6
Total Employment by TAZ		129	15	75	-	41	34	294



TRAFFIC ANALYSIS ZONES
CARLTON, OREGON

FIGURE 3-4

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

Trip Generation

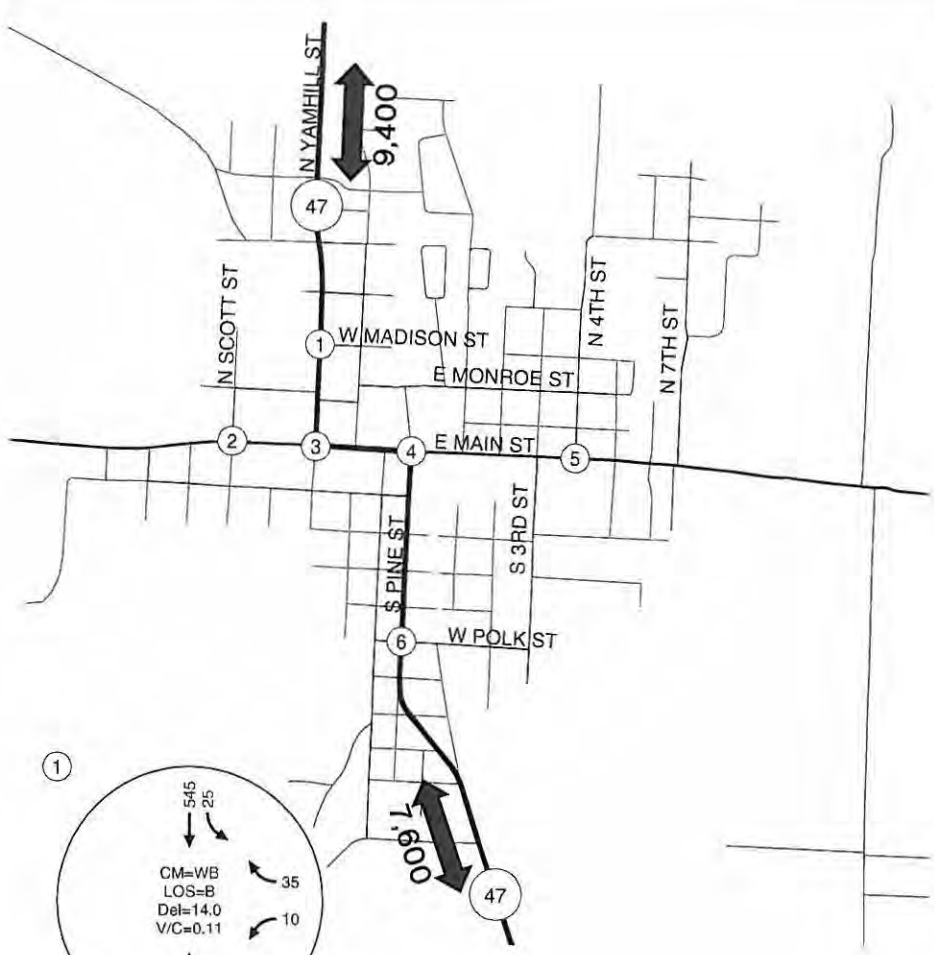
Trip generation estimates for the anticipated growth were based on data published in the standard reference manual, *Trip Generation*, 7th Edition, published by the Institute of Transportation Engineers (ITE). The growth sectors listed in Table 3-10 were evaluated according to equivalent land uses published in *Trip Generation*, which we identified by considering characteristics of ITE categories and those of the growth sectors. Table 3-11 illustrates the estimated trip generation associated with the anticipated population and employment growth in the City. A more detailed description of this process is provided in the attached methodology memo.

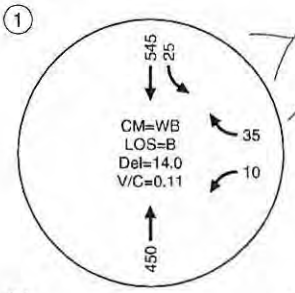
Table 3-11 Estimated Trip Generation by TAZ

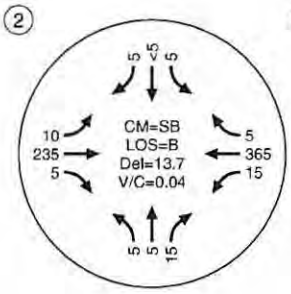
TAZ	Growth Sector	2030 Growth	2030 PM Peak Hour Trips		
			Total	In	Out
1	Residential (units)	15	15	10	5
	Employment	129	125	69	56
TAZ 1 Total			**140**	**79**	**61**
2	Residential (units)	100	96	60	36
	Employment	15	7	3	4
TAZ 2 Total			**103**	**63**	**40**
3	Residential (units)	25	23	15	8
	Employment	75	99	44	55
TAZ 3 Total			**122**	**59**	**63**
4	Residential (units)	30	30	19	11
	Employment	-	-	-	-
TAZ 4 Total			**30**	**19**	**11**
5	Residential (units)	14	14	9	5
	Employment	41	65	32	33
TAZ 5 Total			**79**	**41**	**38**
6	Residential (units)	84	67	43	24
	Employment	34	50	23	27
TAZ 6 Total			**116**	**65**	**51**
Grand Total			**590**	**326**	**264**

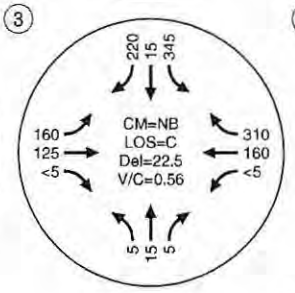
Traffic was distributed to the network according to the trip production and attractions probabilities identified through the Cumulative Analysis procedures in the APM. Background growth was calculated by isolating the external growth at the northern and southern Highway 47 intersections. The trips identified in Table 3-11 were added to that the growth in through traffic.

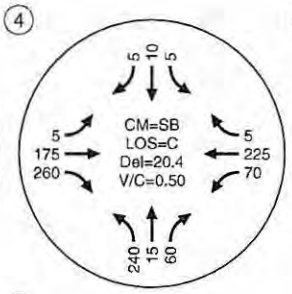
Appendix C contains a detailed description of the Cumulative Analysis process and the traffic volumes used in this analysis. The projected 2030 traffic volumes are shown in Figure 3-5.

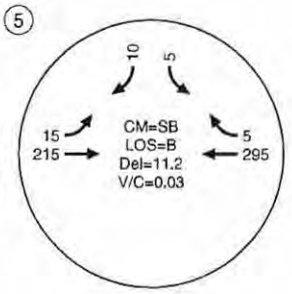


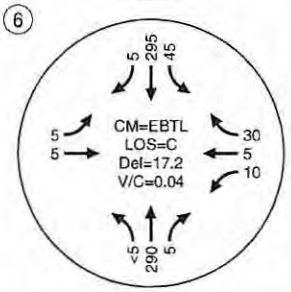












LEGEND

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

XXX - TWO-WAY AVERAGE DAILY TRAFFIC

2030 NO-BUILD TRAFFIC OPERATIONS
PM PEAK HOUR
CARLTON, OREGON

FIGURE **3-5**

2030 No-Build Intersection Operations

The No-Build scenario analyzes traffic operations in the year 2030 assuming the existing transportation network is not improved. Table 3-12 shows the level of service and volume-to-capacity ratio for the intersections under the year 2030 No-Build conditions. *Appendix H provides the 2030 No-Build Conditions operational analysis worksheets for each study intersection.*

Table 3-12 Year 2030 Operational Analysis Results

Intersection	Traffic Control	Standard	Weekday PM Peak Hour			Meets Standard
			LOS	V/C	Delay (sec/veh)	
N Yamhill Street / W Madison Street	One-way Stop	0.85	B	0.11	14.0	Yes
W Main Street / N Scott Street	Two-way Stop	NA[3]	B	0.04	13.7	Yes
N Yamhill Street / W Main Street	Three-way Stop[1]	0.95	C	0.56	22.5	Yes
S Pine Street / W Main Street	Three-way Stop[2]	0.95	C	0.50	20.4	Yes
E Main Street / N 4th Street	One-Way Stop	NA[3]	B	0.03	11.2	Yes
S Pine Street / W Polk Street	Two-way Stop	0.85	C	0.04	17.2	Yes

Notes: LOS = Level of Service, V/C Ratio = Volume-to-Capacity Ratio
Intersection LOS and V/C ratio for unsignalized intersection represent operations of critical movement only.
[1] All southbound movements and the westbound right-turn traffic uncontrolled; all other movements stop-controlled
[2] All northbound movements and the eastbound right-turn traffic uncontrolled; all other movements stop-controlled
[3] This intersection is under City jurisdiction and had no adopted standard

As shown in Table 3-12, all of the study intersections are forecast to operate acceptably according to the applicable operating standards during the year 2030 weekday p.m. peak hour.

Left-Turn Lane Warrants

Left-turn lane warrants for intersections on Highway 47 along the Pine Street and Yamhill Street alignments were reviewed. Based on the projected turning movement counts at the Pine Street/Polk Street and Yamhill Street/Madison Street intersections, left-turn lane warrants are met per the criteria in the ODOT Analysis Procedures Manual. Southbound left-turn lane warrants are met at each of these study intersections. Left-turn lane warrants will be met at any intersection along N Yamhill Street with a left-turn volume greater than ten vehicles in the peak hour. Left-turn lane warrants will be met any intersection along S Pine Street with a left-turn volume greater than approximately 20 vehicles during the peak hour. *Appendix H provides the left-turn lane warrant criterion.*

Queue Length Analysis

Anticipated 95th-percentile queue volumes were examined based on the estimated 2030 traffic volumes, and are shown in Table 3-13.

Table 3-13 Queue Length Analysis (2030)

Intersection	Approach	95th-Percentile Queue Length (feet)		Queue Storage Available (feet)	Adequate Storage?
		2-Minute Rule	SIDRA[1]		
N Yamhill Street/ W Madison Street	Southbound	50		250	Yes
	Westbound	25		225	Yes
W Main Street / Scott Street	Northbound	25		250	Yes
	Southbound	25		325	Yes
	Eastbound	25		275	Yes
	Westbound	25		500	Yes
N Yamhill Street / W Main Street	Northbound	25	25	250	Yes
	Southbound	550	None	275	Yes[2]
	Eastbound	250	125	525	Yes
	Westbound	25	250	200	Yes[3]
S Pine Street / W Main Street	Northbound	375	None	250	Yes[2]
	Southbound	25	25	400	Yes
	Eastbound	25	125	300	Yes
	Westbound	125	125	250	Yes
E Main Street / N 4th Street	Southbound	25		175	Yes
	Eastbound	25		225	Yes
S Main Street / W Polk Street	Northbound	25		200	Yes
	Southbound	75		200	Yes
	Eastbound	25		150	Yes
	Westbound	25		200	Yes

[1] The two downtown three-way stop-controlled intersections were also analyzed using the SIDRA software since the Two-Minute Rule does not accurately estimate queues for these configurations.

[2] This approach is uncontrolled and queues are not expected.

[3] 575 feet of storage is available, but would block side-street intersections up to five percent of the time during the peak 15-minutes of the 30th highest hour.

As shown in Table 3-13, storage is available to accommodate the anticipated 95th-percentile queues at each of the study intersections. It should be noted, however, that a 250-foot queue at the westbound approach of the N Yamhill Street/W Main Street intersection would block the N Kutch Street intersection with W Main Street. This condition is only anticipated to occur occasionally (five percent of the time during the peak 15-minutes of the 30th highest hour). *Appendix I contains the year 2030 queuing analysis calculations.*

Future Segment Operations

The roadway segments on Highway 47 were also analyzed for 2030 traffic operations, which are shown in Figure 3-5. AADT volumes were developed by applying existing peak-to-daily traffic volume ratios to the forecast 2030 p.m. peak hour traffic volumes. As shown, the average daily traffic volumes on Highway 47 are forecast to be well below capacity in 2030. Table 3-14 identifies the traffic operations along Highway 47.

Table 3-14 Year 2030 Segment Operations Summary (Highway 47)

Roadway	Location	AADT	Weekday PM Peak Hour Peak Direction	Peak Hour Peak Directional Volume[1]	Directional Capacity	Peak Hour V/C Ratio
Highway 47	North City Limits	9,400	Southbound	610	1,700	0.36
	North of Main Street	10,700	Southbound	630	1,700	0.37
	South of Main Street	8,500	Southbound	390	1,700	0.23
	South City Limits	7,600	Northbound	355	1,700	0.21

AADT – Average Annual Daily Traffic
V/C Ratio – Volume-to-capacity ratio
[1] Peak Hour Volumes represent peak directional volumes adjusted for Peak Hour Factor and Heavy Vehicles

Roadway Deficiencies

Although there are no traffic operations deficiencies based on the level of service and crash analyses, the following transportation deficiencies have been identified within the City of Carlton based on the above analysis, from the public input from the 1999 TSP, and at the first Technical Advisory Committee and Citizen Advisory Committee meeting for the current TSP update:

- There are only four crossings of the Union Pacific railroad right-of-way that runs north and south within the city. This creates many east-west discontinuities in the otherwise continuous roadway network grid.
- The following facilities were be considered for upgrade from local street to collector classification based on the connectivity they provide and relationship to access and railroad right-of-way crossings,:
    - 1st Street from Roosevelt Street to Main Street
    - Kutch Street from Johnson Street to Roosevelt Street
    - Kutch Street from Main Street to Monroe Street
    - Johnson Street from 4th Street to 7th Street
- During peak hours, approximately one truck every 1.5 minutes pass through the downtown area of the City of Carlton along Main Street and create a negative impact to the downtown/community environment. Up to four times that many trucks pass through the Yamhill Street/Main Street intersection. Approximately seventy percent of the trucks on

Main Street continue through town on Highway 47 and have the potential to be rerouted by a local by-pass.

- Trucks have a difficult time negotiating the Yamhill Street/Main Street and Pine Street/Main Street intersections and encroach on both the approaches and departures of the intersections.
- Highway 47 within the UGB has a crash rate slightly higher than the statewide average for similar facilities. This is a result of the relatively short study segment length. The crashes are primarily located at or near the two Main Street intersections along Highway 47, which have relatively low intersection crash rates.
- Crashes at the two Main Street intersections along Highway 47 are likely related to the unusual three-way stop-control. The three-way stop-control at the Yamhill Street/Main Street and Pine Street/Main Street intersections causes confusion to some motorists who mistake the intersections as all-way stop controlled.
- Left-turn lane warrants will be met at any intersection along N. Yamhill Street with a left-turn volume greater than ten vehicles in the peak hour. Left-turn lane warrants will be met any intersection along S. Pine Street with a left-turn volume greater than approximately 20 vehicles during the peak hour.

PEDESTRIAN AND BICYCLE NETWORK

The following sections document the existing and future conditions and deficiencies for the pedestrian and bicycle network.

Existing Conditions

Pedestrian System

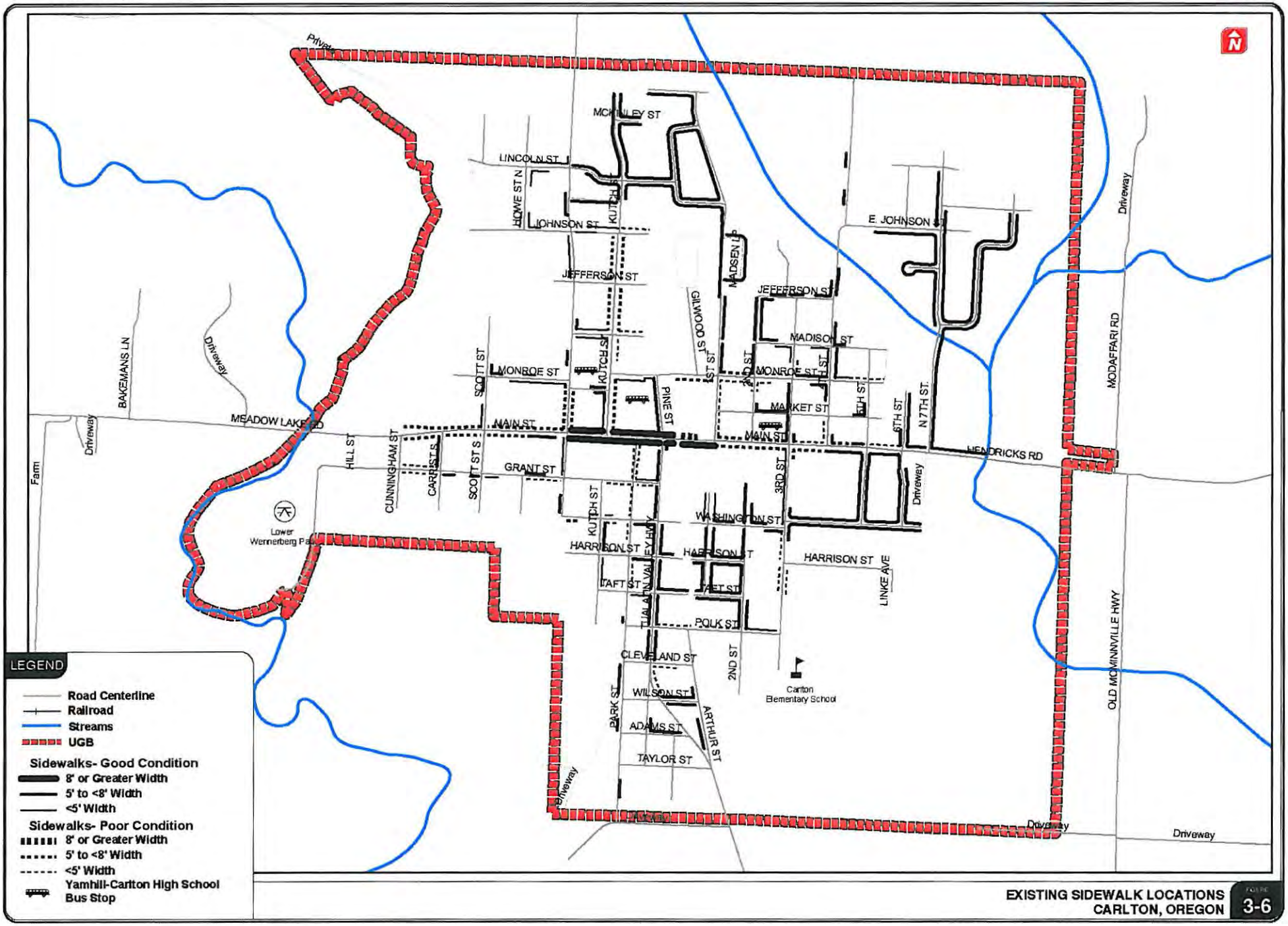
Pedestrian facilities serve a variety of needs. These include:

- Relatively short trips (under a mile) to major pedestrian attractors, such as schools, parks and open spaces, retail centers and public facilities (i.e. libraries, recreation centers, community centers, etc.).
- Recreational trips—for example, jogging or hiking—and circulation within parklands.
- Access to transit (generally trips under 1/2-mile to bus stops).
- Commute trips, where mixed-use development is provided and people have chosen to live near where they work.

Most points within the city are less than ½-mile from the downtown commercial core and most houses are located within 1-mile of the Carlton Elementary School. This indicates that walking could be employed regularly for work, shopping, recreation, and school trips.

Figure 3-6 shows the locations, width, and condition of sidewalks within the study area. Figure 3-6 shows that sidewalks are limited in the City of Carlton. They exist generally in the downtown area along Main Street and in newer residential areas. Other sidewalk locations exist sporadically in the residential areas – but are typically narrow, in poor condition, and disjointed. Widths of less than 5 feet or poor condition sidewalks are considered deficient.

Continuous pedestrian facilities should connect neighborhoods via the collector roadway system to employment areas, specifically the downtown, as well as to nearby pedestrian attractors such as the elementary school, high school bus stops, and Lower Wennerberg Park, and separate pedestrians from vehicular traffic. In addition to providing sidewalks *along* major roadways, opportunities need to be provided at reasonable intervals for pedestrians to *cross* roadways, as well. This latter feature may require trade-offs between the automobile and pedestrian modes.



EXISTING SIDEWALK LOCATIONS
CARLTON, OREGON

FIGURE 3-6

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

Bikeway System

Just as sidewalks do, bicycle facilities (dedicated bicycle lanes in the paved roadway, multi-use paths shared with pedestrians, etc.) can serve a variety of trips. These include:

Trips to major attractors, such as schools, parks and open spaces, retail centers, and public facilities such as recreation centers and community centers, where secure (and preferably covered) bicycle parking is available;

Commute trips, where changing and showering facilities are provided at the workplace, particularly for those trips from outside the city to the central Carlton employment center;

Recreational trips; and

Access to transit, such as the Yamhill County Transit Area system or the Yamhill-Carlton school bus system, where bicycle storage facilities are available at the stop, or where space is available on bus-mounted bicycle racks.

As this list suggests, supporting bicycling as a viable alternative to the automobile requires more than simply providing bicycle lanes. Support facilities, such as secure parking, (particularly at Carlton Elementary, in the downtown, and at the transit stops located at the Carlton Grocery Store and City Hall) are also needed before the bicycle trip will be considered as a practical alternative by most potential users.

Dedicated bicycle facilities should be provided along major streets where automobile traffic speeds are significantly higher than bicycle speeds. Bicycle facilities should connect residential neighborhoods to schools, retail centers, and employment areas. However, allowing bicycle traffic to mix with automobile traffic is acceptable where the average daily traffic (ADT) on a roadway is less than 3,000 vehicles per day, according to the *Oregon Bicycle and Pedestrian Plan* (ODOT, 1995).

Providing bicycle lanes on local streets would be appropriate where the volume of bicyclists is high, vehicle speeds are higher than 25 miles per hour, or poor sight distance exists. Streets leading to schools, for example, may have high volumes of bicyclists and a dedicated bicycle lane may be appropriate. In areas where no street connection currently exists, a multi-use path may be appropriate to provide adequate facilities for bicyclists.

ODOT categorizes bicycle facilities into the following four major classifications:

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

- Bike paths - These bicycle facilities are exclusive bicycle lanes separated from the roadway.

There are no bicycle facilities within the City, and the shoulders along Highway 47 are not adequate to provide bicyclists with a shoulder bikeway. Based on the *Oregon Bicycle and Pedestrian Plan*, traffic volumes in Carlton are suitable for bicyclists to share the roadway with vehicles on all roadways except Highway 47 and Main Street. Traffic volumes on Highway 47 and Main Street warrant the use of shoulder bikeways or bicycle lanes. Lower volume roadways were considered for bike shoulders or lanes if anticipated to be used by children as part of Safe Routes to School as described in the following sections.

Safe Routes to School Program

To help complete the pedestrian and bicycle networks, the City and the Yamhill-Carlton School District could pursue a grant from the federal Safe Routes to School (SRTS) program. The goals of SRTS are to:

increase the ability and opportunity for students to walk and bicycle to school;

promote walking and bicycling to school and encourage a healthy and active lifestyle at an early age; and

facilitate the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution within two miles of the school.

In order to qualify for the Oregon SRTS program, the applicant (City and School District) must create an Action Plan. The following sections outline the required components of the Action Plan.

School Information

This section includes basic information about the school, including location, enrollment, and contact information for the Safe Routes to School Action Plan.

Forming the School Team

The applicant must identify a coalition of interested parties responsible for gathering the necessary information needed to assess current attitudes and existing conditions. The School Team should include the following:

- School representatives
- Local government
- Community representatives

Assessing the Modes of Student Travel

In order to develop an understanding of the routes by which students travel to school, the School Team must identify the following information.

- Student Tally – an in-class travel tally administered by teachers or volunteers.
- Parent Survey – collects information about factors, beliefs, and attitudes parents' decisions about their children walking and bicycling to school.
- Walking and Bicycling Audits – a walk-about or bike-about with students, parents, neighbors, school staff, and other stakeholders.
- Community Involvement – a mapping or brainstorming session involving the local community and/or School Team to solicit input on conditions and possible solutions and to determine the best current and/or future routes.

A traffic assessment should also be reviewed to identify traffic volumes, posted and actual speeds, traffic crash data, and crosswalk information.

Summarizing the Findings

The school team should analyze the survey evaluation results, collected data, and maps and identify the barriers and hazards to children walking and bicycling to school.

Identifying the Solutions and Creating the Action Plan

The School Team will then recommend solutions that make up the Action Plan. Careful consideration must be given to the following SRTS components:

- Engineering – Creating operational and physical improvements to the infrastructure surrounding schools that reduce speeds and potential conflicts with motor vehicle traffic, and establish safer and fully accessible crossings, walkways, trails, and bikeways. Engineering strategies are best used with the remaining E's.

- Education – Teaching children about the broad range of transportation choices, instructing them in important lifelong bicycling and walking safety skills, and launching driver safety campaigns in the vicinity of the schools.

- Encouragement – Creating events, activities, and ongoing programs to promote walking and bicycling and providing safe opportunities for parents and students to travel together and inspire each other.

- Enforcement – Partnering with local enforcement to ensure traffic laws are obeyed in the vicinity of the schools (this includes enforcement of speeds, yielding to pedestrians in crossings, and proper walking and bicycling behaviors), and initiating community enforcement such as crossing guard programs.

- Evaluation – Monitoring and documenting outcomes and trends through the collection of data, including the collection of data before and after the intervention(s).

Submitting the Action Plan

After systematically assessing the barriers and hazards to children walking and bicycling to school and developing strategies for improvement, the document and application can be submitted for the Oregon Safe Routes to School Funding.

Safe Routes to Schools Assessment

The 2008 transportation system inventory includes an inventory of pedestrian and bicycle facilities within the walk zone (one mile) of the Carlton Elementary School site located at 420 South 3rd Street. All residents within the Carlton city limits are considered to be within the walk zone and are not provided school bus service. A portion of the walk zone extends beyond the Carlton city limits; however school bus service is provided to all students outside of the city limits. Sidewalks should be provided along all roadways within the city limits to provide a safe route to school for all residents. However, several priority routes are described below.

Carlton Elementary School

As shown in Figure 3-6, there are a number of sidewalks that are missing or in poor condition near the Carlton Elementary School. There are no sidewalks adjacent to the school property itself on either side of 3rd Street. Sidewalks exist intermittently along 3rd Street, though many of them are less than five (5) feet in width and in poor condition. A number of new sidewalks have been installed in recent residential developments located west and north of the school site in the vicinity of 2nd Street and E. Washington Street; however, residents from these areas do not have access to the school through a continuous sidewalk network.

Currently there are three crosswalks and school crossing signs located on 3rd Street between Harrison Street and Polk Street. Crosswalks and school zone speed limit signs also exist on E. Main Street between 2nd and 4th streets and on Highway 47 (Pine Street) between Taft Street and Cleveland Street.

There are no designated bicycle facilities currently located within one mile of the school. Bicycle travel within the school walk zone is limited to shared roadways and shoulders.

Yamhill-Carlton High School

Safe routes to the bus stops for the Carlton students that attend Yamhill-Carlton High School in Yamhill, Oregon should also be provided. Students that take the bus to Yamhill-Carlton High School are picked up at City Hall, Carlton Elementary School, and near the Kutch/Johnson street intersection. Students are dropped off at the city parking lot located on Pine Street north of Main Street, Carlton Elementary School, and near the Kutch/Johnson street intersection. Sidewalks are either missing or in very poor condition along N Kutch Street and E Monroe street within the vicinity of the bus stop locations. The designated school crossings along E Main Street and the regular pedestrian crossings downtown along Main Street provide some crossing opportunities to the high school students. However, there are no crossing opportunities along Highway 47 for students living in the northwest quadrant of the city that use the high school bus stops.

In addition to the poor condition and lack of sidewalk and bicycle facilities in the vicinity of the Elementary School and High School bus stops, the railroad right-of-way serves as an additional barrier to safe and convenient bicycle and pedestrian access due to the limited number of street crossings in the city. Polk Street is currently the only east-west road that crosses the railroad right-of-way in the southern portion of the city. Although not a formal crossing, many students cross the railroad right-of-way at E Washington Street. E Washington Street provides a direct route for many students that live in the northwest and southwest quadrants of the city. Formalizing this railroad right-of-way crossing and proving a pedestrian crossing on Highway 47 at Washington Street should be considered in the alternatives analysis.

Future Conditions

Pedestrian System

As identified through technical analysis, several pedestrian system improvements are needed to serve the following trip types: relatively short trips to major pedestrian attractors, recreational trips, access to transit, and commute/school trips. These improvements include the establishment of continuous sidewalks connecting neighborhoods with employment centers, pedestrian attractors, schools, and transit stops as well as designated pedestrian crossing locations.

New developments in the City of Carlton should provide adequate pedestrian facilities within and directly adjacent to the new neighborhoods. Therefore, the provision of missing pedestrian connections is largely a retrofitting task that should not grow beyond its current size. The major gaps in the existing pedestrian system identified by the community at the Citizens Advisory Committee meeting in April 2008 were related to providing safe routes to school and include:

- S 3rd Street between E Monroe Street and Carlton Elementary School
- W Polk Street between S Pine Street and Carlton Elementary School

Additional significant gaps related to Safe Routes to School include:

- E Monroe Street from N Kutch Street to N 3rd Street
- N Kutch Street from E Lincoln Street to E Monroe Street
- N 3rd Street from E Monroe Street to E Main Street
- Pedestrian crossing along Highway 47 at Monroe Street
- Railroad right-of-way crossing at E Washington Street
- Pedestrian crossing along Highway 47 at E Washington Street

Figure 3-6 indicates that other pedestrian connectivity gaps also exist. There is a fundamental pedestrian system that should be in place to facilitate walking to/from key pedestrian generators within the City. This system includes all arterial and collector streets. In addition to the school routes identified above, the following sidewalk gaps in the arterial/collector roadway system should be considered as priority

- *Main Street*: The completion of the partial sidewalks along Main Street between N 7th Street and N 1st Street would serve major pedestrian attractors in the downtown area. It would also connect to the existing sidewalk system on the north-south streets such as S 5th Street and S 6th Street.

- *Railroad Right-of-Way Crossings:* Identifying opportunities to implement pedestrian crossings through the railroad right-of-way, such as at Washington Street, would help improve east-west connectivity throughout the City. Pedestrian connections can be created relatively easily while maintaining future railroad opportunity.

- *N Yamhill Street:* The extension of sidewalks north along N Yamhill Street would provide downtown pedestrian access to and from the northern portion of the City. It would also link to the relatively extensive pedestrian network along and around Lincoln and Kutch Streets.

- *W Grant Street:* The completion of the partial sidewalks along W Grant Street from S Pine Street to S River Street would connect to Wennerberg Park, a popular destination.

- *N 1st Street:* The completion of the partial and poor sidewalks along N First Street from Main Street to N Monroe Street would provide a continuous sidewalk route to downtown for residents north on First Street.

The Safe Routes to School and other priority collector/arterial roadway sidewalk network gaps are shown in Figure 3-7.

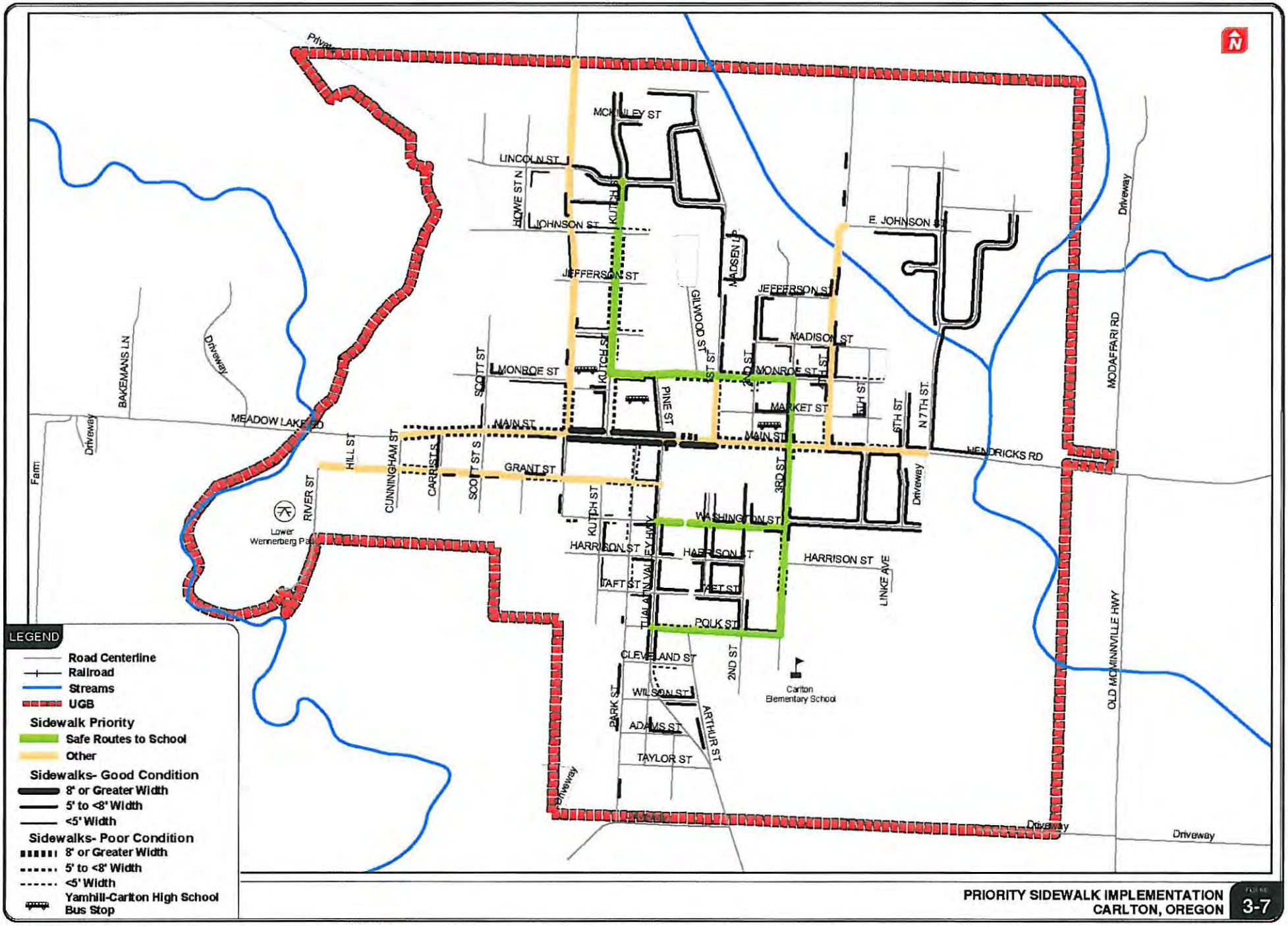
Bicycle System

A bicycle system should connect residential areas with the elementary school, high school bus stops, and the downtown. The following types of improvements are needed to support the use of bicycling for intra-city trips to and from these destinations:

- Providing a network of bicycle lanes on arterials and school routes and provide signed routes on other collector level streets to promote travel throughout the City.

- Improved signing.

The local bicycle network should generally feature designated bicycle lanes on all arterials and on streets carrying in excess of 3,000 vehicles per day. In Carlton, this includes only Highway 47 and Main Street. However, bicycle lanes should also be on collector streets that serve as primary routes to school. Bicycle connectivity to Lower Wenneberg Park would also be desirable. Additionally, off-street multi-use paths may be desirable to provide recreational opportunities and network connectivity. Opportunities for off-street multi-use paths may exist along the railroad right-of-way and along Hawn Creek. Since there are currently no designated bicycle routes in Carlton, the following prioritizes roadways where they are most needed.



PRIORITY SIDEWALK IMPLEMENTATION
CARLTON, OREGON

FIGURE 3-7

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- Highway 47: The provision of bicycle facilities on Highway 47 would serve major pedestrian attractors in the downtown area.
- Main Street: The provision of bicycle facilities on Main Street would serve major pedestrian attractors in the downtown area as well as Lower Wenneberg Park.
- *Polk Street:* The completion of bicycle facilities on Polk Street between S Pine Street and Carlton Elementary School
- *3rd Street:* The completion of bicycle facilities on 3rd Street between Main Street and Carlton Elementary School would serve bicycle trips to Carlton Elementary School.
- *Railroad Right-of-way:* The completion of an off-street bicycle facility along the railroad right-of-way would provide an off-street facility for elementary school trips as well as recreational and other local trips in general.

Working with ODOT and Yamhill County to extend bicycle lanes on Highway 47 and Main Street beyond the city limits could also increase bicycle recreation and tourism trips to the city.

Pedestrian and Bicycle Deficiencies

- There are many sidewalk locations that are missing or deficient within the City of Carlton. Many of the existing sidewalks are in poor physical condition, too narrow, or poorly maintained with overgrown vegetation. The sidewalk system within the City is fragmented and disjointed and is difficult to use the sidewalks to safely walk from one area of town to another.
- Sidewalks in good condition are desirable and should be provided on all collector, arterial, and local streets within the city limits; however, due to cost constraints a system of prioritization is necessary. Sidewalks shall be prioritized based on the necessity to provide Safe Routes to School and each roadway's importance in the roadway hierarchy. Priority sidewalk gaps, maintenance areas, and pedestrian crossings (in no particular order) include the following:
    - Safe Routes to School:
        - S 3rd Street between E Monroe Street and Carlton Elementary School
        - W Polk Street between S Pine Street and Carlton Elementary School
        - E. Monroe Street from N. Kutch Street to N. 3rd Street
        - N. Kutch Street from LE. Lincoln Street to E. Monroe Street
        - Pedestrian crossing along Highway 47 at Monroe Street
        - Railroad right-of-way crossing at E. Washington Street
        - Pedestrian crossing along Highway 47 at Washington Street
    - Other priority arterials/collectors
        - Main Street from N 7th Street to N 1st Street

  - Railroad Right-of-Way Crossings to improve east-west connectivity throughout the City.
  - N Yamhill Street from Main Street to Lincoln Street
  - W Grant Street from S Pine Street to S River Street
  - N 1st Street from E. Monroe Street to E. Main Street
- There are currently no designated bicycle routes in Carlton. Bicycle lanes are desirable on all collector and arterial roadways; however roadways with traffic volumes greater than 3,000 vehicles per day, those on Safe Routes to School, as well as those that create recreational opportunities should be the priority. The following prioritizes potential bicycle facilities:
  - Highway 47 within the city limits
  - Main Street within the city limits
  - Polk Street between S Pine Street and Carlton Elementary S
  - 3rd Street between Main Street and Carlton Elementary School
  - Railroad right-of-way multi-use path

PUBLIC TRANSIT SERVICES

The following documents the existing and future conditions and deficiencies for the public transit system and services.

Existing Conditions

The following describes the existing Carlton transit service population and facilities.

Carlton Service Population

Information in the 2000 Census was used to identify the number of people in Carlton more likely to use, or be more reliant upon, non-auto transportation modes such as sidewalks, bikeways, public transportation, or paratransit services. Public transportation services are generally targeted to serve the needs of two groups:

- People who are transit disadvantaged who do not have, or can not operate, an automobile to obtain medical, educational, social or recreational services and employment; and
- People who presently use a car but would use other transportation alternatives to commute to work.

People living in Carlton characterized as transit disadvantaged in 2000 included:

- 111 people aged 12 to 16 years.
- 178 people greater than 60 years old.
- 87 non-institutionalized people with a go-outside-the-home disability over the ages of 16.

- 74 individuals with low or moderate incomes who generally may have no personal auto access.

The transit disadvantaged portion of Carlton's population was, in 2000, 450 people, or 29.7% of the total population.

Census data showed that in 2000 the workforce in Carlton was 759 people or about 50.1 percent of the population. Driving alone was the most common way to get to work, followed by carpooling. A few individuals walked or bicycled to work while 2.6 percent worked at home. About 63.6 percent of the workforce was at their place of employment within 29 minutes of travel, 23.8 percent had travel times between 30 and 59 minutes, and 9.9 percent traveled more than one hour. The mean travel time to work was 27.4 minutes in 2000.

Inventory of Public Transportation Services and Facilities

The recently formed Yamhill County Transit Area District (YCTA) provides both fixed route and paratransit service in Carlton and the Yamhill County area. Intercity bus service is provided by LINKS, a fixed route service of the YCTA system. Fixed route service to Carlton is provided via the *Highway 47 Corridor LINK* service *(a.k.a. Route #33)*, which connects Carlton to McMinnville, Yamhill, Cove, Gaston and Hillsboro (which connects with Metro's MAX light-rail system). This service is provided four times per day on weekdays. Bus stops for YCTA's *Highway 47 Corridor LINK* currently include the Carlton Grocery Store located at 320 N. Yamhill Street (Highway 47) and City Hall located at 191 E. Main Street. This service provides a connection to the *99W Corridor LINK* in McMinnville.

The *99W Corridor LINK* is a fixed route service operating Monday through Saturday. It operates approximately ten times per day on one to two hour headways during weekdays and three times per day on Saturday. The service connects McMinnville, Lafayette, Dayton, Dundee, Newberg and Sherwood. It is linked with the Portland Metropolitan area Tri-Met system in Sherwood. While the *99W Corridor LINK* provides a connection in McMinnville, the closest stop to Carlton is in Lafayette.

The YCTA paratransit service in Carlton provides dial-a-ride services to all residents with 24-hour advance notice. The service operated Monday through Friday between 10 a.m. and 2 p.m. The system works with a budget that is a combination of Special Transportation Fund money, fair box revenues and a county levy. Fares were $1.50 per trip in 2008.

Cherriots Rideshare serves the mid-Willamette Valley and helps people identify carpool opportunities.

The closest taxi company to Carlton is Shamrock Taxi, which operates out of the Newberg and McMinnville areas. Shamrock Taxi provides 24-hour pickup and delivery as well as wheelchair transport throughout Yamhill County.

Passenger rail services are provided by AMTRAK, with Portland Union Station being the closest stop. Shamrock Taxi provides on-call service to the station. The Oregon Rail Passenger Policy and Plan calls for a single-track, electric rail service between McMinnville and Tualatin. The closest

point to Carlton on that line would be Lafayette. In the distant future, some consideration has been given to connecting McMinnville with Forest Grove. This line would pass through Carlton.

The closest air passenger service is provided from Portland International Airport [PDX]. Shamrock Taxi provides on-call service to PDX from Carlton. The Caravan Airport Shuttle provides one-round trip service daily to the PDX airport. The closest pickup point is McMinnville.

Future Conditions

Future transit needs in the City of Carlton could include expanded regional and intercity commuter services, park-and-ride lots, as well as more widespread awareness of the existing Cherriots Rideshare carpool program.

The Yamhill County *Coordinated Human Services Public Transportation Plan* from 2007 also identified the need for more frequent transit during special events such as Carlton Fun Days and peak wine tasting times such as the fall crush time and holiday weekend.

RAIL SERVICE

There is one rail right-of-way owned by the Union Pacific Railroad that runs through the City of Carlton. The right-of-way runs parallel to Highway 47 on the east side. The following describes the existing and future conditions for this corridor. No tracks remain in the railroad right-of-way that runs through Carlton.

Future Rail Service

There are efforts underway to preserve a portion of the existing railroad right-of-way for future rail service between McMinnville and Forest Grove. A rail feasibility study was completed for Yamhill County in 2008 that recommended two separate lines for freight and passengers (IBI Group, 2008). Due to steep grades associated with the Rex Hill rail line between Newberg and the Tualatin area, the study recommended a separate rail line for freight service that runs from McMinnville north through Carlton to join an existing east-west freight line near Forest Grove. While the McMinnville-Forest Grove route is attractive for freight, the study noted the commute time from Forest Grove to Portland is lengthy and the MAX light rail service is not planned to reach the Forest Grove area in the near future. For these reasons, the study recommends using the Rex Hill line for commuter rail service due to its ability to tie in to the MAX light rail service and the lower cost of repair to the existing rail line associated with the lighter weight of commuter rail.

AIR SERVICE

There are no airports within the City of Carlton planning area. The nearest airport to the City of Carlton is approximately 10 miles to the south, in the City of McMinnville. For regularly scheduled commercial flights, City residents utilize the Portland International Airport.

PIPELINE SERVICE

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

such as natural gas, oil, and gasoline. There are currently no major regional pipelines through Carlton.

Future Pipeline Service

Palomar Gas Transmission is in the planning stages of building a natural gas pipeline to serve NW Natural customers in northwest Oregon. One of the potential routes runs along the eastern boundary of Carlton's UGB.

WATER TRANSPORTATION FACILITIES

There are no navigable waterways within the City of Carlton, and therefore no water transportation services available.

TRANSPORTATION FUNDING

There are a variety of options available to fund transportation improvements within the City of Carlton. The following section identifies the funding sources that have contributed to projects within the City of Carlton over the past fifteen years and projects the future funding availability from these existing funding sources.

In the future it is likely that the transportation program in Carlton will be funded by a combination of funding sources, including Transportation System Development Charges (TSDCs). The following section estimates the potential TSDC funds that could be generated by future development within the City of Carlton. The purpose of this section is to provide a reasonable estimate of future transportation funding for the development of the financially constrained transportation system plan (see Section 5 - Financially Constrained Alternative).

Existing Funding

Table 3-15 provides a summary of the funding that has been used for transportation projects within the City of Carlton over the past fifteen years. The funds have been adjusted to year 2007 dollars based on construction cost trends for Oregon[2]. As shown in Table 3-15 there have been 12 projects completed within the City of Carlton since 1993. The total dollar value of these projects in year 2007 dollars is approximately $693,500. None of the past funding sources have been from dedicated funds. *The construction cost index information used to convert to year 2007 dollars is included in Appendix J.*

[2] Washington State Department of Transportation (WSDOT) provides extensive information on construction cost trends of several States (Washington, California, Colorado, Oregon, South Dakota, and Utah) and is referenced on the FWHA construction cost website. http://www.wsdot.wa.gov/biz/construction/constructioncosts.cfm

Table 3-15 Past Transportation Project Funding (15-Year History)

Year	Location	Improvements Completed	Cost	2007 Cost	Funding Source
2008	W. Grant St (Yamhill to S. Howe)	Pavement overlay, replace sidewalks on south side and add sidewalks on north side with curb	$25,000	$25,000	ODOT SCA Grant
2006	Pine St (Main St to E. Monroe)	Grinding, pavement resurfacing, portions of new curb, gutter, and sidewalks on west side	$50,000	$48,589	50% - ODOT SCA Grant 50% - City
2006	W. Main (Pine to Yamhill)	Sidewalk improvement project and pavement overlay	$440,775	$389,463	61% - ODOT CDBG Grant 35% - ODOT "Quick Fix" Grant 4% - City
2006	W. Main (City limits to Cunningham)	Pavement overlay	$5,000	$4,859	County
2004	Washington St (2nd to 3rd Street)	New road improvement (dirt road)	$46,000	$68,432	ODOT SCA Grant
2003	2nd Street (Polk to Harrison)	Half street improvement	$30,000	$42,035	ODOT SCA Grant
2003	Washington Street (S. Kutch to S. Yamhill St.)	Pavement overlay	$5,000	$7,006	City
2002	Taylor Street (Hwy. 47 to S. Park Street)	Pavement overlay	$5,000	$7,348	City
2002	Highway 47 (Pine St to southern city limits)	Grinding, overlay, sidewalks from Pine and Main to Polk Street, concrete around manholes	$200,000	$293,902	ODOT
2000	Grant Street (S. Park to S. Yamhill Street)	Pavement overlay and striping	$7,000	$11,399	City
1995	N. Kutch Street (W. Johnson St. to W. Garfield St.)	Improve gravel road to 36 ft. section w/ sidewalks, curbs, and storm drainage on both sides	$29,400	$51,343	ODOT SCA Grant
1993	E. Polk Street (RR ROW to S. 3rd Street)	Roadway widening (4 ft.) and pavement overlay	$22,000	$46,104	ODOT SCA Grant
			ODOT Funds City Funds County	**$924,996 $65,625 $4,859**	**$61,666/yr $4,375/yr $324/yr**
			TOTAL	**$995,480**	**$66,365/yr**

CDBG = Community Development Block Grant
SCA = Special City Allotment (Dedicated Funds)

As shown in Table 3-15, an average of approximately $66,000 per year in 2007 dollars has been spent within the City of Carlton on transportation projects. The majority of the funds have been provided by ODOT grants. The City of Carlton has provided approximately $4,400 per year on average for transportation projects.

Potential SDC Funds

The City of Carlton is considering implementing a Transportation System Development Charge (TSDC) to help fund future transportation improvements. While the TSDC rate will not be determined until a final project list and TSDC methodology is developed and approved by the City Council, an estimate of potential future SDC funds was made to help inform the alternatives analysis and provide an estimate of future transportation funds.

Assuming a future TSDC rate of $250 per daily trip[3] with future growth trips equal to approximately 5,900[4], future funds from a TSDC program would be approximately $1,475,000. This equates to approximately $73,750 per year over the next twenty years.

Future Funding

An estimate of future funding can be made by looking at past funding sources and the estimated TSDC funds. Table 3-16 provides a summary of the potential future project funding (in year 2007 dollars) over the next five, ten, and twenty years based on an assumed average funding level of approximately $66,000 per year from the three agencies combined and approximately $73,750 per year from TSDCs.

It is unknown how ODOT's potential $2.9[5] million dollar pavement preservation project along Highway 47 through Carlton may impact future project funding. Because this will be a STIP project, it is assumed for planning purposes that this will not impact the availability for the City to obtain grant funds from ODOT as is typical of past funding. However, approximately one-third of past ODOT funding was not grant-related and may be unlikely to be available in the future.

Additional funding and financial sources for future transportation projects are described in Section 6: Implementation of the Transportation System Plan.

[3] A review of TSDC rates for small cities indicates a range of $100 to $500 per daily trip. Source: Don Ganer.

[4] Approximated to be 10 times the projected weekday p.m. peak hour trips in Table 3-11.

[5] Roughly half of the project costs will be spent within the city limits.

Table 3-16 Future Transportation Project Funding

	5-Year Forecast	10-Year Forecast	20-Year Forecast
ODOT	$308,000	$616,500	$1,233,500
City	$22,000	$44,000	$87,500
County	$1,500	$3,000	$6,500
TSDC	$369,000	$737,500	$1,475,000
Total	**$700,500**	**$1,401,000**	**$2,802,500**

As shown in Table 3-16, it is anticipated that approximately $2.8 million will be available for transportation project funding over the next twenty years (with approximately $87,500 provided by the City of Carlton, $1,233,500[6] provided by ODOT[7], and $1,475,000 provided by TSDC funds). This is the amount that can be reasonably assumed to fund the transportation plan using existing funding sources and an estimated TSDC.

SUMMARY

The following is a summary of the current conditions and future deficiencies of the transportation modes serving Carlton.

Roadway Network

- Intersection Operations: All of the unsignalized study intersections in Carlton currently operate acceptably and are forecast to continue to operate acceptably in 2030.
- Roadway Segment Operations: All of the Highway 47 roadway segments in Carlton currently operate acceptably and are forecast to continue to operate acceptably in 2030.
- Roadway Deficiencies: The following roadway deficiencies have been identified:
    - There are only four crossings of the Union Pacific railroad right-of-way that runs north and south within the city. This creates many east-west discontinuities in the otherwise continuous roadway network grid.

[6] This amount should be reduced by approximately one third if future non-grant funds will be impacted by the future Highway 47 pavement preservation project.

[7] The projected ODOT funds include grant funds from ODOT, such as the SCA grant, as well as non-ODOT grants which are administered by ODOT, such as the CDBG grant.

- The following facilities were considered for upgrade from local street to collector classification based on the connectivity they provide and relationship to access and railroad right-of-way crossings:
  - 1st Street from Roosevelt Street to Main Street
  - Kutch Street from Johnson Street to Roosevelt Street
  - Kutch Street from Main Street to Monroe Street
  - Johnson Street from 4th Street to 7th Street
- During peak hours, approximately one truck every 1.5 minutes pass through the downtown area of the City of Carlton along Main Street and create a negative impact to the downtown/community environment. Up to four times that many trucks pass through the Yamhill Street/Main Street intersection. Approximately seventy percent of the trucks on Main Street continue through town on Highway 47 and have the potential to be rerouted by a local by-pass.
- Trucks have a difficult time negotiating the Yamhill Street/Main Street and Pine Street/Main Street intersections and encroach on both the approaches and departures of the intersections.
- Highway 47 within the UGB has a crash rate slightly higher than the statewide average for similar facilities. This is a result of the relatively short study segment length. The crashes are primarily located at or near the two Main Street intersections along Highway 47, which have relatively low intersection crash rates.
- Crashes at the two Main Street intersections along Highway 47 are likely related to the unusual three-way stop-control. The three-way stop-control at the Yamhill Street/Main Street and Pine Street/Main Street intersections causes confusion to some motorists who mistake the intersections as all-way stop controlled.
- Left-turn lane warrants will be met at any intersection along N. Yamhill Street with a left-turn volume greater than ten vehicles in the peak hour. Left-turn lane warrants will be met any intersection along S. Pine Street with a left-turn volume greater than approximately 20 vehicles during the peak hour.

Pedestrian Network

- **Existing Pedestrian Conditions:** There are many sidewalk locations that are missing or deficient within the City of Carlton. Many of the existing sidewalks are in poor physical condition, too narrow, or poorly maintained with overgrown vegetation. The sidewalk system within the City is fragmented and disjointed and is difficult to use the sidewalks to safely walk from one area of town to another.
- **Pedestrian Deficiencies:** Sidewalks in good condition are desirable and should be provided on all collector, arterial, and local streets within the city limits; however, due to cost constraints a system of prioritization is necessary. Sidewalks shall be prioritized based on the necessity to provide Safe Routes to School and each roadway's importance in the

roadway hierarchy. Priority sidewalk gaps, maintenance areas, and pedestrian crossings (in no particular order) include the following:

- Safe Routes to School:
  - S 3rd Street between E Monroe Street and Carlton Elementary School
  - W Polk Street between S Pine Street and Carlton Elementary School
  - E. Monroe Street from N. Kutch Street to N. 3rd Street
  - N. Kutch Street from LE. Lincoln Street to E. Monroe Street
  - Pedestrian crossing along Highway 47 at Monroe Street
  - Railroad right-of-way crossing at E. Washington Street
  - Pedestrian crossing along Highway 47 at Washington Street
- Other priority arterials/collectors
  - Main Street from N 7th Street to N 1st Street
  - Railroad Right-of-Way Crossings to improve east-west connectivity throughout the City.
  - N Yamhill Street from Main Street to Lincoln Street
  - W Grant Street from S Pine Street to S River Street
  - N 1st Street from E. Monroe Street to E. Main Street

Bicycle Network

- **Existing Bicycle Conditions:** There are currently no designated bicycle facilities in Carlton.
- **Bicycle Deficiencies:** Bicycle lanes are desirable on all collector and arterial roadways; however, roadways with traffic volumes greater than 3,000 vehicles per day, those on Safe Routes to School, as well as those that create recreational opportunities should be the priority. Based on these criteria, the following prioritizes potential bicycle facilities:
    - Highway 47 within the city limits
    - Main Street within the city limits
    - Polk Street between S Pine Street and Carlton Elementary
    - 3rd Street between Main Street and Carlton Elementary School
    - Railroad right-of-way multi-use path

Public Transit Service

- **Existing Public Transportation:** Several public transportation services are provided within the City of Carlton. Including:
    - LINKS – provides service via the Highway 47 Corridor LINK service, which connects between Carlton and McMinnville, Yamhill, Cove, Gaston and Hillsboro (which connects with Metro's MAX light-rail system).
    - 99W Corridor LINK – fixed route service connecting McMinnville, Lafayette, Dayton, Dundee, Newberg and Sherwood
    - YCTA Paratransit Service – dial-a-ride service to all residents with 24-hour advance notice.
- **Future Transportation:** Future transit needs in the City of Carlton could include expanded regional and intercity commuter services, expanded transit frequency during Carlton Fun Days and peak wine tasting times, park-and-ride lots, as well as more widespread awareness of the existing Cherriots Rideshare carpool program.

Rail Service

- There is one rail right-of-way owned by the Union Pacific Railroad that runs through the City of Carlton, but no tracks remain in the right-of-way that runs through Carlton.

Air Service

- No public airports are located within the City of Carlton. A general aviation airport is located in McMinnville, north of Carlton. The nearest airport with scheduled passenger service is the Portland International Airport, located approximately 25 miles northeast of Carlton.

Pipeline Service

- There are currently no major regional pipelines through Carlton.

Water Transportation

- There are no navigable waterways within the City of Carlton, and therefore no water transportation services available.

Transportation Funding

- **Existing Funding:** An average of approximately $66,000 per year in 2007 dollars has been spent within the City of Carlton on transportation projects over the past 15 years. The majority of the funds have been provided by ODOT. The City of Carlton has provided approximately $4,400 per year on average for transportation projects.
- **Transportation SDC:** Assuming a future TSDC rate of $250 per daily trip, future funds from a TSDC program would be approximately $1,475,000. This equates to approximately $73,750 per year over the next twenty years.
- **Future Funding:** It is anticipated that approximately $2.8 million will be available for transportation project funding over the next twenty years (with approximately $87,500 provided by the City of Carlton, $1,233,500 provided by ODOT, and $1,475,000 provided by TSDC funds).

Section 4
Transportation
Alternatives Analysis

Alternatives Analysis

The following section summarizes the alternatives analysis completed to address the future transportation deficiencies identified for the roadway, pedestrian, bicycle, and public transit networks in the Existing and Future Conditions section. This section also includes an evaluation of the various transportation alternatives, including cost estimates of the alternative solutions, as compared to projected future transportation funding.

ROADWAY ALTERNATIVES

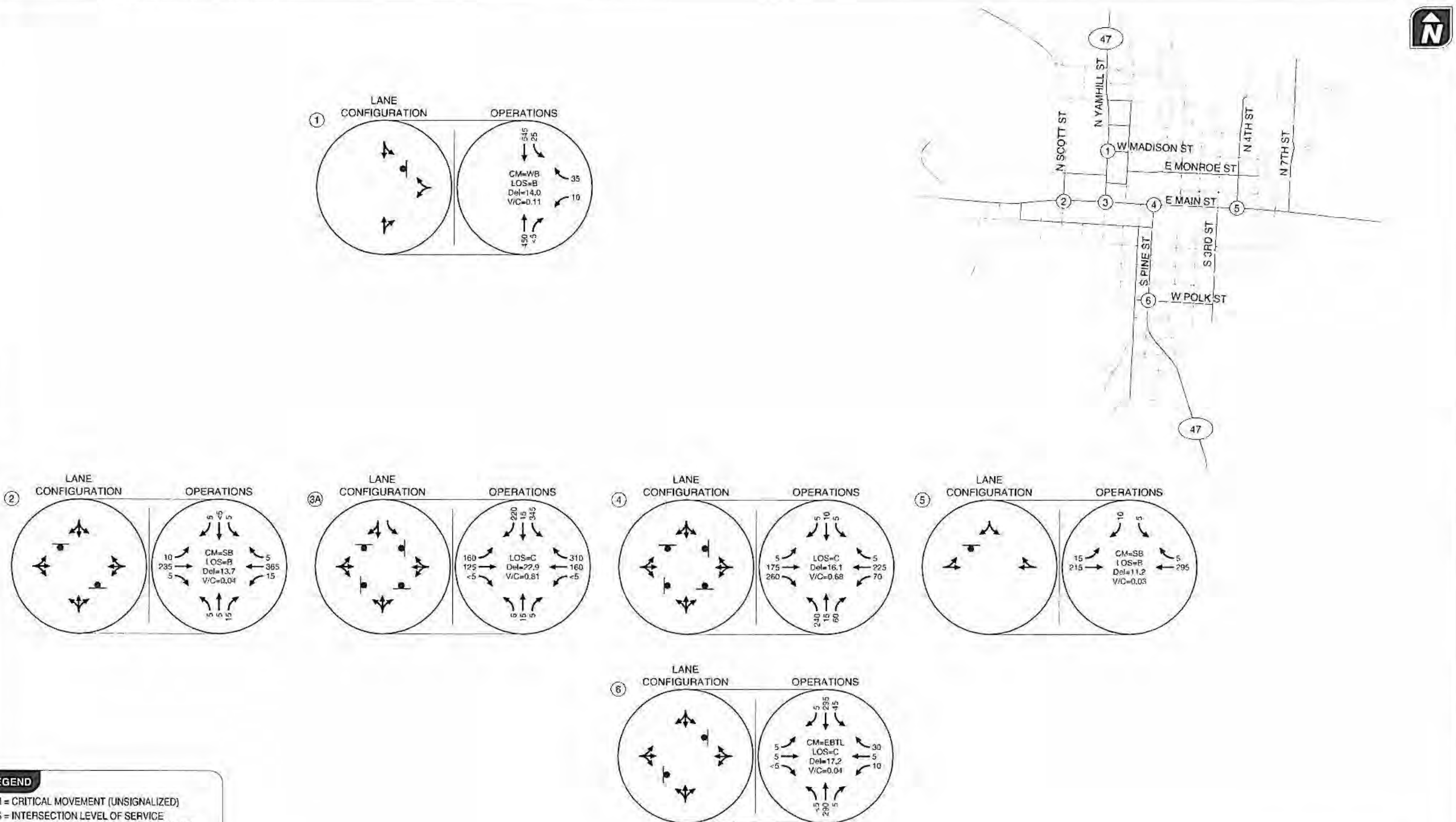
The primary focus of the roadway alternatives analysis was the development of alternatives to mitigate truck traffic through the downtown and to address safety concerns at the three-way stop control intersections on Main Street (Yamhill/Main and Pine/Main street intersections). The roadway alternatives analysis also included a review of left turn-lane warrants on Highway 47 and additional locations for potential railroad right-of-way crossings to improve east-west street connectivity within the city.

Main Street

Three alternatives were analyzed for Main Street. The alternatives include modifying the existing three-way stop-controlled intersections at the Yamhill Street/Main Street and Pine Street/Main Street intersections, reducing the truck traffic on Main Street via a Main Street vehicle by-pass, and improving the geometry of the Yamhill Street/Main Street intersection for trucks. It should be noted that in the no-build condition the intersections of Main Street/Yamhill Street and Main Street/Pine Street will continue to meet ODOT's operational standards with volume-to-capacity ratios of 0.56 and 0.50, respectively. The alternatives are primarily intended to mitigate truck volumes and eliminate the confusing three-way stop control configuration.

Alternative 1: Traffic Control Changes at Yamhill Street/Main Street and Pine Street/Main Street Intersections

Alternative 1 assumes the existing transportation network is unchanged under 2030 conditions, except for the intersections of Yamhill Street/Main Street and Pine Street/Main Street. The existing three-way stop-controlled intersections (with uncontrolled movements for Highway 47 traffic) have been analyzed as all-way stop-controlled intersections. No additional modifications to the transportation network are assumed under this alternative. Figure 4-1 illustrates the assumed lane configurations and traffic control as well as the future operations analysis. The traffic operations for the traffic control changes considered are also summarized in Table 4-1.



LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)

LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)

Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)

V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

ALTERNATIVE 1
ALL WAY STOP CONTROL
CARLTON, OREGON

FIGURE 4-1

Table 4-1 Alternative 1 Operational Analysis Results (2030)

Intersection	Traffic Control	Standard	Weekday PM Peak Hour			Meets Standard
			LOS	V/C	Delay (sec/veh)	
N Yamhill Street / W Main Street	All-way Stop w/ SB Left-Turn Lane[1]	0.95	C	0.81	22.9	Yes
S Pine Street / E Main Street	All-way Stop	0.95	C	0.68	16.1	Yes

Notes: LOS = Level of Service, V/C Ratio = Volume-to-Capacity Ratio
Intersection LOS and V/C ratio for unsignalized intersection represent operations of critical movement only.

As shown in Table 4-1, the Pine Street/Main Street intersection would continue to operate acceptably well beyond 2030 with all-way stop traffic control. The Yamhill Street/Main Street intersection is also anticipated to operate acceptably in 2030 if converted to all-way stop-control; however, it would require the addition of an exclusive southbound left-turn lane. The roadway inventory indicates 55 feet of ROW and 38 feet of pavement on this section of Yamhill Street. Given the large radii required in the northwest and northeast corners to accommodate trucks, providing an exclusive southbound left-turn lane may not be feasible given the existing ROW constraints. An alternative mitigation would be a two-phase traffic signal using the existing lane configurations.

A signal warrant analysis was conducted for the Yamhill Street/Main Street intersection to determine whether the installation of a traffic signal would be appropriate in future conditions. The analysis found that, given the projected traffic volumes, Traffic Signal Warrants 1, 2, and 3 would be met. *Appendix K contains the signal warrant analysis worksheet.*

Without the left-turn lane the intersection would operate at a level-of-service F with a delay of 48.8 seconds and a volume-to-capacity ratio of 1.06. However, the intersection is anticipated to meet the 0.95 standard until approximately year 2026. Due to the limited right-of-way for the turn lane, the relatively long life span of having the all-way stop only, a design exception for the at the all-way stop without the additional turn lane at the Yamhill Street/Main Street intersection may be feasible.

A queuing analysis was also conducted for Alternative 1. Table 4-2 illustrates the anticipated queues at the two Main Street intersections if converted to all-way stop-control. The queue length analysis was conducted using two methods: the 2-minute rule and the procedure described in the Highway Capacity Manual (HCM). The 2-minute rule, preferred by ODOT, estimates queue lengths based on the anticipated number of left turns on the major street approach in a two-minute interval. This procedure can overestimate queue lengths at all-way stop-controlled intersection, so the HCM method was also included. *The traffic operation and queuing analysis worksheets for Alternative 1 are also provided in Appendix K.*

Table 4-2 Alternative 1 Queue Length Analysis (Year 2030)

Intersection	Approach	95th-Percentile Queue Length (feet)		Queue Storage Available (feet)	Adequate Storage?
		2-Minute Rule	HCM		
N Yamhill Street / W Main Street (All-Way Stop)	Northbound	25	25	250	Yes
	SB Left	550[1]	175	NA	Design to Queue
	SB Through/Rt	NA[2]	75	275	Yes
	Eastbound	250	100	525	Yes
	Westbound	25	225	200	Yes[3]
S Pine Street / W Main Street (All-Way Stop)	Northbound	375[1]	100	250	Yes
	Southbound	25	25	400	Yes
	Eastbound	25	150	300	Yes
	Westbound	125	100	250	Yes

[1] The two-minute rule does not accurately predict queues at all-way stops. It is primarily intended to be used at two-way stop controlled intersections with exclusive left-turn lanes; therefore, the HCM analysis from should be used for planning purposes at this location.

[2] The two-minute does not apply to through/right-turn lanes because it is for calculating estimated queues for left-turns.

[3] The two-minute rule underestimates the queue length for the westbound due to a small number of left turning vehicles, so the HCM analysis should be applied for planning purposes. The estimated 225-foot queue would back up to the intersection of N Kutch Street, but adequate storage exists beyond the intersection.

As shown in Table 4-2, the anticipated queue length for the southbound and westbound approaches at the Yamhill Street/ Main Street intersection exceed the available storage. A 450-foot queue on the southbound approach would back up beyond the Yamhill Street intersection with Monroe Street. There is adequate storage beyond Monroe Street, assuming drivers leave an adequate gap for cross streets. Similarly, a 250-foot queue on the westbound approach would block the Main Street intersection with Kutch Street, but could be accommodated by allowing a gap for the intersection.

Alternative 2: Highway 47 Main Street Bypass

A vehicle bypass of the Main Street section of Highway 47 would allow traffic, including truck traffic, to pass through Carlton without traveling on the downtown portion of Main Street. The proposed bypass would reroute northbound and southbound Highway 47 through traffic along Monroe Street (on a new alignment between Yamhill Street and Kutch Street) and Pine Street. This would allow truck traffic to avoid navigating the difficult turning maneuvers at the two downtown Highway 47 and Main Street intersections and reduce the vehicle and truck traffic on Main Street. With the construction of the bypass, the two Main Street intersections would no longer need to prioritize Highway 47 through traffic and would be converted to traditional configurations. The Yamhill Street/Main Street intersection could be converted to all-way stop-control and the Pine

Street/Main Street intersection could be converted to two-way stop-control with uncontrolled north and southbound movements but would require the addition of a westbound left-turn lane.

Two traffic control options for the Yamhill Street/Monroe Street intersection were analyzed. In Option A, Monroe Street would intersect with Yamhill Street at a "T" intersection. Northbound and southbound traffic would be uncontrolled while westbound traffic would be stop-controlled. It is assumed that there would be an exclusive southbound left-turn lane provided. Option B would slightly realign the intersection to allow Highway 47 traffic to flow freely and require the northbound approach to stop. *Concept drawings of these two options from the 1999 TSP are provided in Appendix L.* The primary right-of-way constraint for either of these options appears to be Pine Street from Main Street to Monroe Street. The Street Inventory indicates 30 feet of right-of-way in this section despite indicating a 42-foot paved section.

Future year traffic operations were analyzed for both intersection control options assuming the bypass reroutes a significant portion of the Highway 47 through traffic along Pine Street and Monroe Street. The number of vehicles using the Main Street bypass was estimated by identifying the 2030 through trips on Highway 47. Turning movement volumes at the two Main Street intersections were examined in each direction. Northbound left-turns at the S Pine Street/W Main Street intersection were compared to westbound right-turns at the N Yamhill Street/W Main Street intersection. The smaller of these volumes was assumed to represent through trips on Highway 47. The same process was used in the southbound direction. Together, these volumes were rerouted to the bypass in Alternative 2.

The resulting traffic volumes and operations for Options A and B of the Highway 47 Main Street Bypass alternative are illustrated in Figure 4-2 and Figure 4-3, respectively. Table 4-3 illustrates the anticipated traffic operations for Options A and B. Option A may result in less vehicles using the bypass, as compared to Option B due to the stop controlled movement at Yamhill Street; however, for analysis purposes, the volumes were held constant between the two alternatives in order to remain conservative at the Yamhill Street/Monroe Street intersection. *The traffic operation and queuing analysis worksheets for Alternative 2 are provided in Appendix M.*

Table 4-3 Alternative 2 Operational Analysis Results (2030)

Intersection	Traffic Control	Standard	Weekday PM Peak Hour			Meets Standard
			LOS	V/C	Delay (sec/veh)	
N Yamhill Street / W Main Street	All-way Stop	0.80	B	0.49	11.7	Yes
S Pine Street / W Main Street	Two-way Stop w/ WB Left-turn Lane[1]	0.95	E	0.45	42.0	Yes
N Yamhill Street / W Monroe Street (A)	Two-way Stop w/ SB Left-turn Lane	0.95	B	0.30	11.4	Yes
N Yamhill Street / W Monroe Street (B)	Two-way Stop	0.95	C	0.45	18.4	Yes

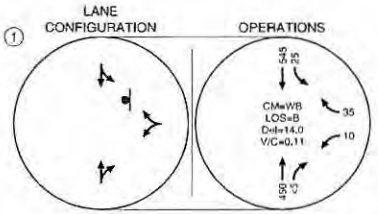
Notes: LOS = Level of Service, V/C Ratio = Volume-to-Capacity Ratio
Intersection LOS and V/C ratio for unsignalized intersection represent operations of critical movement only.
1 The roadway inventory indicates 60 feet of ROW and 40 feet of pavement is available on the east approach of the Main Street/Pine Street intersection. Providing a westbound left-turn lane appears to be feasible if on-street parking was prohibited between Pine Street and the railroad right-of-way.

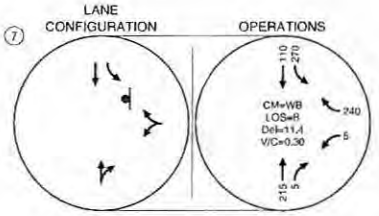
As shown in Figure 4-2, Figure 4-3, and Table 4-3, the conversion of the Pine Street/Main Street intersection would operate acceptably under either scenario with two-way stop control with the addition of an exclusive westbound left-turn lane[8]. The Yamhill Street/Main Street intersection would continue to operate acceptably well beyond 2030 with all-way stop traffic control.

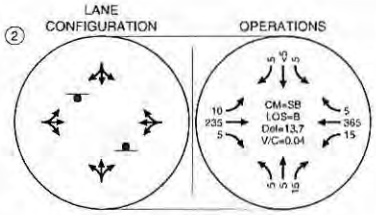
The Yamhill Street/Monroe Street intersection would operate acceptably under both Option A and Option B intersection configurations. Option B would provide free flow traffic for Highway 47 but would require more right-of-way than Option A.

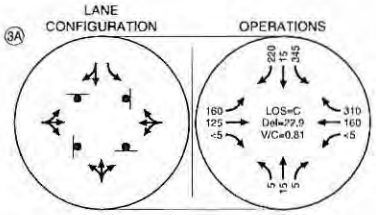
A queue length analysis was conducted for both options of Alternative 2, and is summarized in Table 4-4.

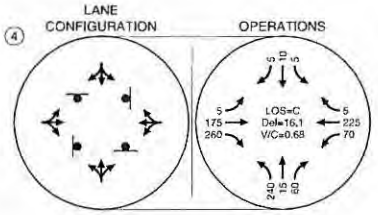
[8] The roadway inventory indicates 60 feet of ROW and 40 feet of pavement is available on the east approach of the Main Street/Pine Street intersection. Providing a westbound left-turn lane appears to be feasible if on-street parking was prohibited between Pine Street and the railroad right-of-way.

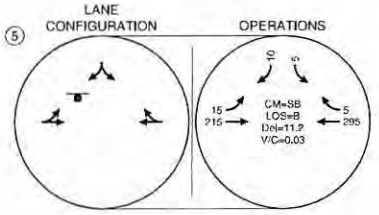


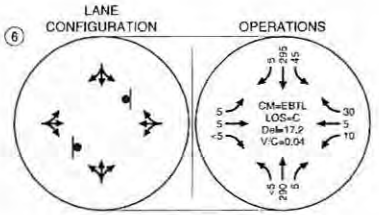










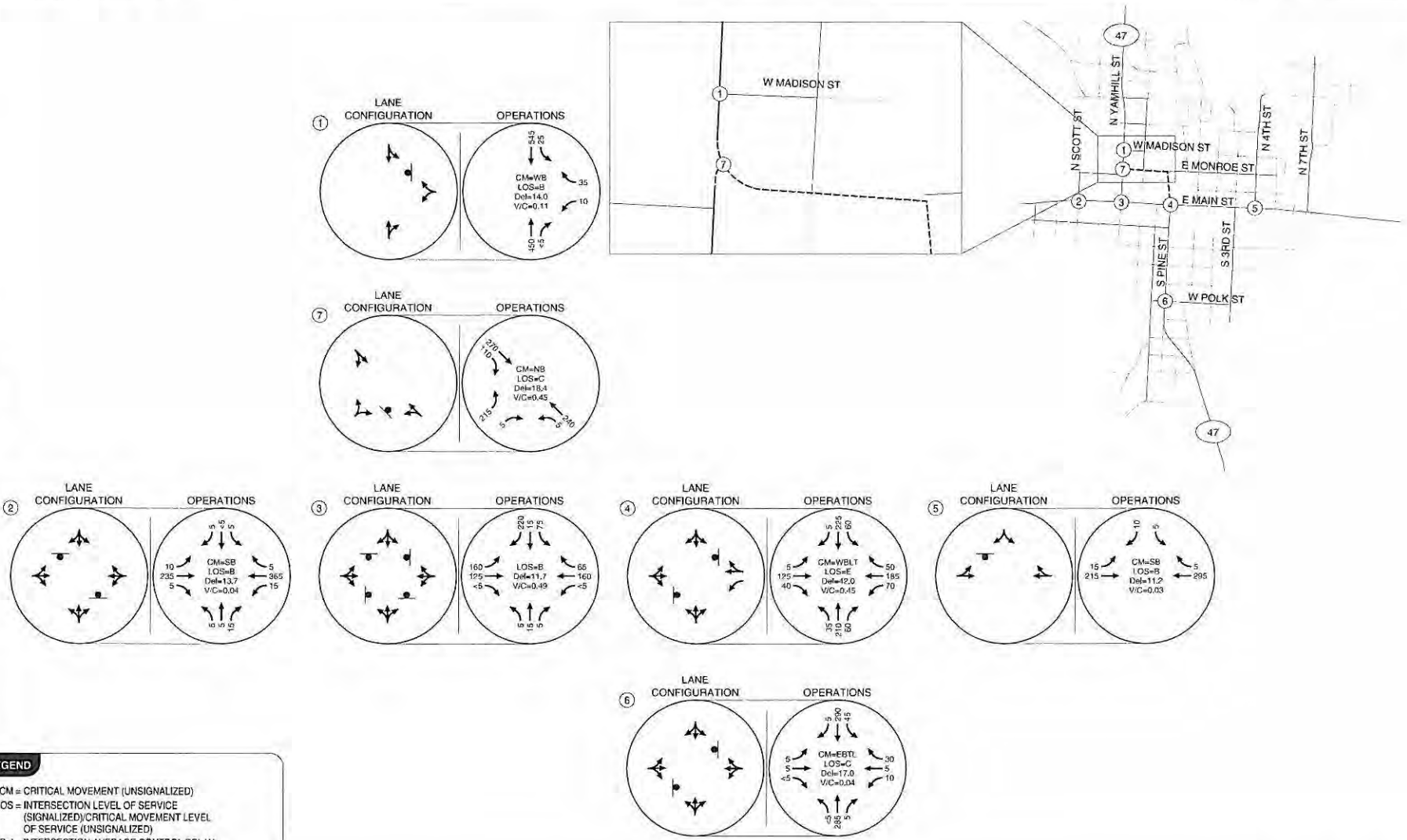


LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
- - - - PROPOSED HIGHWAY 47 TRUCK BYPASS

ALTERNATIVE 2
MAIN STREET BYPASS A
CARLTON, OREGON

FIGURE 4-2



LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
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V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
- - - - PROPOSED HIGHWAY 47 TRUCK BYPASS

ALTERNATIVE 3
MAIN STREET BYPASS B
CARLTON, OREGON

FIGURE 4-3

Table 4-4 Alternative 2 Queue Length Analysis (2030)

Intersection	Approach	95th-Percentile Queue Length (feet)		Queue Storage Available (feet)	Adequate Storage?
		2-Minute Rule	HCM		
N Yamhill Street / W Main Street (All-Way Stop)	Northbound	25	25	250	Yes
	Southbound	125	75	275	Yes
	Eastbound	200	75	525	Yes
	Westbound	25	50	200	Yes
S Pine Street / W Main Street (Two-Way Stop)	Northbound	75	25	250	Yes
	Southbound	125	25	400	Yes
	Eastbound	25	100	300	Yes
	Westbound Left	125	75	NA	Design to Queue
	Westbound Through/Right	NA	150	250	Yes
N Yamhill Street / W Monroe Street (A) (Two-Way Stop)	Southbound Left	425[1]	25	NA	Design to Queue
	Westbound	25	50	225	Yes
N Yamhill Street / W Monroe Street (B) (Two-Way Stop)	Northbound	350[1]	75	400	Yes
	Westbound	25	25	225	Yes

[1] The 2-minute rule overestimates the left turn queue at this intersection since it doesn't account for the very low volumes on the conflicting movement.

As shown in Table 4-4, all of the anticipated 95th percentile queues can be accommodated on the assumed transportation network, provided westbound vehicles queuing at Pine Street/Main Street leave a gap at the intersection of N 1st Street.

Alternative 3: Geometric improvements at Yamhill Street/Main Street

Geometric improvements could be completed at the Yamhill Street/Main Street intersection to increase southbound right-turn radii and relocate the power pole in the northwest quadrant of the intersection. Additionally, widening the northbound approach at the Main Street/Pine Street intersection will improve the ability of trucks to navigate the northbound left turn. These improvements should be considered in combination with both Alternative 1 and Alternative 2.

Planning Level Cost Estimates: Main Street Alternatives

Planning level cost estimates for the Main Street improvement alternatives are identified in Table 4-5.

Table 4-5 Main Street Alternatives Planning Level Cost Estimate

Alternative	Segment		Length (ft)			Planning Level Cost Estimate[3]	Available ROW?
	Location	Improvement	Storage[1]	Reverse Curve[1]	Taper[2]		
1: Traffic Control Changes	N Yamhill Street/ W Main Street	All-way Stop w/ SB Left-turn Lane	175	150	210	$154,000	No
	S Pine Street/ E Main Street	All-way Stop	-	-	-	$25,000	Yes
					Total	**$179,000**	
2: Main Street By-pass	N Pine St/ W Monroe St	Widen and reconfigure to accommodate through truck traffic	1,000			$759,000	No
	N Yamhill Street/ W Main Street	All-way Stop	-	-	-	$25,000	Yes
	S Pine Street/ W Main Street	Two-way Stop w/ WB Left-turn Lane	75	150	175	$119,000	?
	N Yamhill Street/ W Monroe Street	Two-way Stop w/ SB Left-turn Lane	25	150	210	$109,000	?
					Total	**$1,012,000**	
3: Geometry Improvements at Yamhill/Main	N Yamhill Street/ W Main Street	Utility relocation and curb radii modifications	-	-	-	$50,000	?
	S Pine St/ W Main St	Widen and reconfigure to accommodate NB left-turn truck traffic	-	-	-	$50,000	?
					Total	**$100,000**	

[1] Pavement Area = length * 14-foot lane width
[2] Pavement Area of Taper = ½ * Taper length * 14-foot lane width
[3] Cost estimate based on $13 per square foot with 15% engineering factor and 50% contingency factor, not including right-of-way acquisition

As shown in Table 4-5, the total estimated planning level cost of the Main Street roadway improvements under Alternative 1 is $179,000. Under Alternative 2 the total planning level costs are approximately $1,012,000. Alternative 3, which should be completed with both Alternatives 1 and 2 is anticipated to cost approximately $100,000. Alternative 3 could be considered on its own to help improve existing geometric deficiencies at the Yamhill Street/Main Street intersection but would not reduce truck traffic on Main Street or improve the existing confusing traffic control; however, traffic control changes are not necessary in order to meet ODOT's operational standards in the future.

Highway 47

Left-turn lane warrants for intersections on Highway 47 along the Pine Street and Yamhill Street alignments were reviewed as part of the Existing and Future Conditions analysis found in Section 3. Per the criteria in the ODOT Analysis Procedures Manual, left-turn lane warrants will be met at any intersection along N Yamhill Street with a left-turn volume greater than ten vehicles in the peak hour. Left-turn lane warrants will be met any intersection along S Pine Street with a left-turn volume greater than approximately 20 vehicles during the peak hour.

Based on this assessment, several locations were identified where left-turn lanes are likely to be warranted in the future. These include the southbound approach to the intersections of Yamhill Street/Lincoln Street, Yamhill Street/Roosevelt Street, Yamhill Street/Madison Street (or Monroe Street if a by-pass alternative is selected) and Pine Street/Polk Street and the northbound approach to the Pine Street/Grant Street intersection.

Planning level cost estimates for the Highway 47 improvements are identified in Table 4-6. For the purpose of this analysis, it is assumed that the all of Highway 47 outside of Main Street would be widened to a three-lane cross section with a center left-turn lane.

Table 4-6 Highway 47 Improvements Planning Level Cost Estimate

Roadway	Segment		Improvement	Length (ft)[1]			Planning Level Cost Estimate[3]	Available ROW?
	From	To		Storage[1]	Reverse Curve[1]	Taper[2]		
N Yamhill Street	UGB	W Main Street	Provide center left-turn lane	2,500	150	210	$827,000	Yes
S Pine Street	W Main Street	UGB	Provide center left-turn lane	1,015	300	420	$902,000	Yes
Total							**$1,729,000**	

[1] Pavement Area = length * 14-foot lane width
[2] Pavement Area of Taper = ½ * Taper length * 14-foot lane width
[3] Cost estimate based on $13 per square foot with 15% engineering factor and 50% contingency factor

As shown in Table 4-6, the total estimated cost of the Highway 47 roadway improvements is anticipated to be approximately $1,729,000.

The roadway inventory indicates fifty feet of right-of-way on Pine Street from Main Street to Polk Street. Therefore, a center turn lane could be added but it would not comply with city or ODOT standard cross-sections (neither bike lanes nor a 15-foot travel lane for a shared lane could be accommodated). A 38-foot paved area (12-foot through lanes with a 14-foot center left-turn lane), curb-tight five-foot sidewalks, with 1-foot easements on either side would be the maximum cross-section that could fit within the existing right-of-way. The landscape strips would be removed. The safety benefits of the left-turn lanes should be weighed against the increased crossing distance for pedestrians, particularly given that Pine Street has a school crossing zone.

The roadway inventory indicates that a range of 40 to 70 feet of right-of-way is available on Yamhill Street between Lincoln Street and north of Roosevelt Street. Right-of-way may need to be purchased but a review of aerial photography does not indicate any issues with existing structures.

Railroad Crossings

As noted in the previous section, the railroad right-of-way that runs through the City of Carlton is owned by the Union Pacific Railroad. No tracks remain in the railroad right-of-way but there are efforts underway to preserve the right-of-way for future freight rail service between McMinnville and Forest Grove. Therefore, all new crossings of this right-of-way require approval from ODOT Rail and the Union Pacific Railroad.

Two potential additional railroad right-of-way crossings were identified in the future conditions analysis to enhance vehicle and pedestrian/bicycle connectivity within the City. They include:

- Roosevelt Street (full roadway crossing)
- Wilson Street (full roadway crossing)
- Washington Street (pedestrian and bicycle crossing only)

Roosevelt Street is a future collector roadway with one section east of the railroad right-of-way existing currently. A permit for the Roosevelt Street crossing has already been granted; however, construction of the crossing is still necessary for it to function as a collector roadway. A segment west of the railroad right-of-way connecting to Highway 47 is currently planned but the railroad crossing will not be completed until additional development east of the railroad right-of-way occurs.

The Future Street Plan (below) identifies Wilson Street as a future collector that extends from its intersection with Arthur Street east to the UGB. In order for Wilson Street to operate effectively, it will need to cross the railroad right-of-way to connect the southeast portion of the City with Highway 47.

The Washington Street crossing would serve pedestrian and bicycle traffic only. There is no Washington Street extension to Highway 47 but the crossing would address a deficiency of the pedestrian and bicycle system and formalize a crossing that is currently heavily used. Approval for this crossing has not been granted and would be required for construction. The right-of-way requirements and cost estimates for these projects are summarized in Table 4-7.

Table 4-7 Railroad Right-of-Way Crossing Planning Level Cost Estimates

Roadway	Crossing Type	Length (ft)	Right-of-Way (ft)	Planning Level Cost Estimate
Roosevelt Street	Roadway	100	38	$85,500
Wilson Street	Roadway	70	38	$60,000
Washington Street	Pedestrian and Bicycle Only	240	12	$19,500
Total				**$165,000**

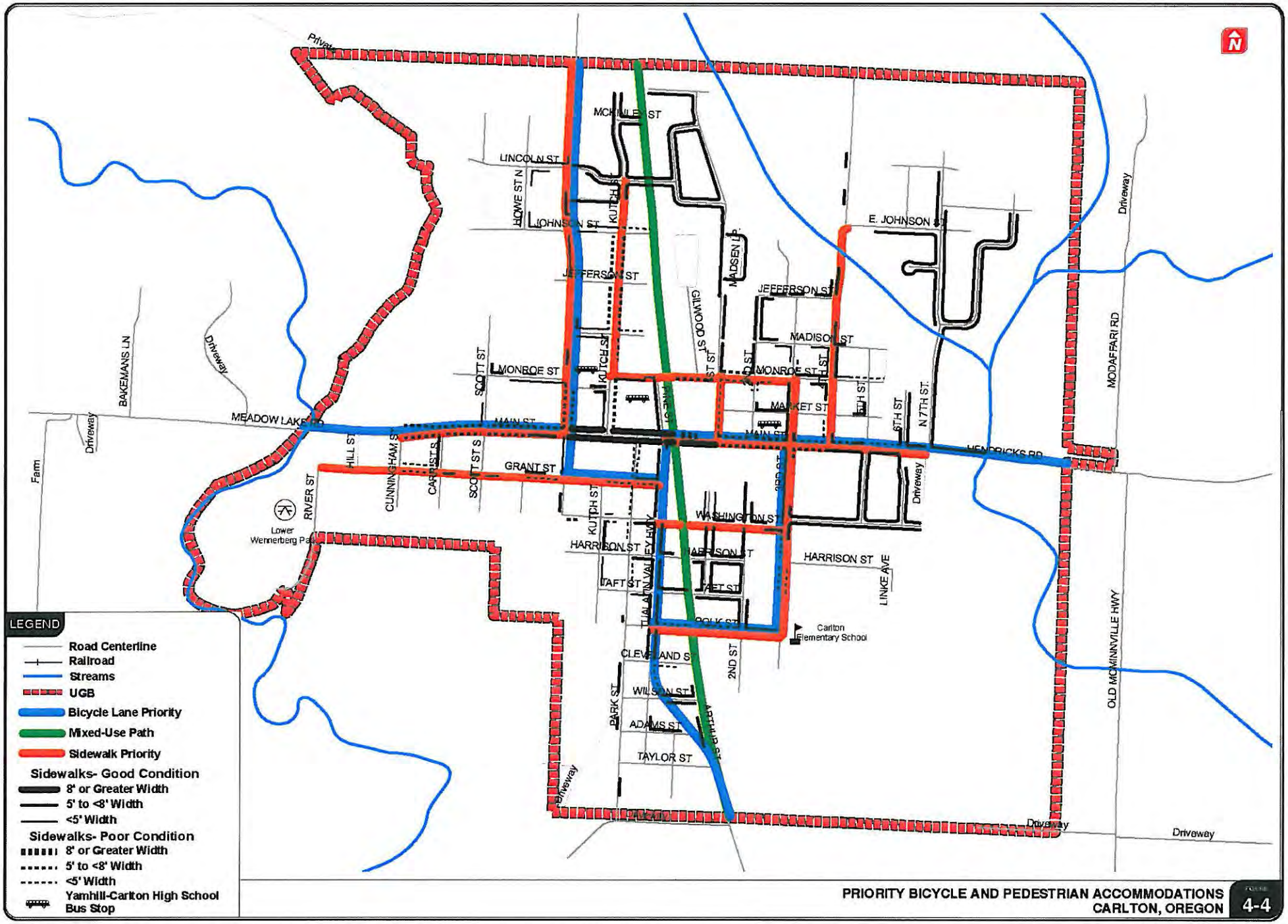
As shown in Table 4-7, the total estimated cost of the additional railroad right-of-way crossings is anticipated to be approximately $165,000.

PEDESTRIAN AND BICYCLE NETWORKS

Sidewalks are required on all local, collector, and arterial roadways within the city limits. Bicycle lanes are required on all collector and arterial roadways with over 3,000 vehicles per day, which includes only Highway 47 and Main Street in the year 2030 horizon. There are many roadways without sidewalks, sidewalks in poor condition or with critical gaps. There are currently no bicycle lanes provided within the city limits on any facilities. The previous section prioritized the need for sidewalks based on Safe Routes to School and system connectivity needs and identified all of the roadways that warrant exclusive bicycle lanes based on their projected vehicle traffic volumes as well as additional bicycle routes that may warrant bicycle lanes based on their need to serve children. The following identifies the sidewalk and bicycle lane projects that were identified as priorities identified in the Existing and Future Conditions analysis and provides planning level cost estimates to complete all of the identified priorities. Figure 4-4 illustrates the pedestrian and bicycle network improvements.

Pedestrian and Bicycle Priorities

- Provide sidewalks on the following locations:
  - 3rd Street between E Monroe Street and Carlton Elementary School
  - Polk Street between S Pine Street and Carlton Elementary School
  - Monroe Street from N Kutch Street to N 3rd Street
  - N Kutch Street from W Lincoln Street to W Monroe Street
  - E Main Street from 7th Street to Pine Street
  - Railroad Right-of-Way Crossings to improve east-west connectivity throughout the City.
  - N Yamhill Street from W Main Street to Lincoln Street
  - W Grant Street from S Pine Street to S River Street
  - N 1st Street from E Monroe Street to E Main Street



PRIORITY BICYCLE AND PEDESTRIAN ACCOMMODATIONS
CARLTON, OREGON

  - N 4th Street from E Main Street to E Roosevelt Street
- Provide railroad right-of-way crossing at E. Washington Street
- Provide pedestrian crossings in the following locations:
  - Highway 47 at Monroe Street
  - Highway 47 at Washington Street
- Provide bicycle lanes in the following locations:
  - Highway 47 within the city limits
  - Main Street within the city limits, excluding the Highway 47 segment
  - Polk Street between S Pine Street and Carlton Elementary
  - S 3rd Street between E Main Street and Carlton Elementary School
  - N Yamhill Street between W Main Street and W Grant Street
- Construct a multi-use path in the railroad right-of-way

Table 4-8 provides the planning level cost estimates for the priority pedestrian and bicycle network improvements. Excluding the cost of the multi-use path, the total cost to complete all of the identified pedestrian and bicycle priorities is approximately $5,572,000.

Table 4-8 Bicycle and Pedestrian Improvements Cost Estimate

Improvement	Location			Length (ft)[1]	Curb & Gutter (ft)[1]	Cost Estimate	Available ROW?
	Street	From	To				
Sidewalks[2]	1st Street	Monroe Street	Main Street	920	920	$73,000	Yes
	3rd Street	Monroe Street	Polk Street	3,522	1,594	$213,000	Yes
	Grant Street	Cunningham Street	Pine Street	3,316	1,370	$224,000	No
	Kutch Street	Lincoln Street	Monroe Street	2,294	322	$127,000	?
	Main Street	1st Street	7th Street	3,732	3,732	$239,000	Yes
	Monroe Street	Kutch Street	3rd Street	2,552	512	$162,000	Yes
	Polk Street	Pine Street	3rd Street	1,792	1,294	$132,000	Yes
	Washington Street	Pine Street	3rd Street	1,825	550	$119,000	Yes
	Yamhill Street	North City Limits	Washington Street	6,099	6,099	$483,000	?
					Total	**$1,772,000**	
Pedestrian Crossings	Highway 47	Monroe Street		NA	-	$50,000	Yes
	Highway 47	Washington Street		NA	-	$50,000	Yes
					Total	**$100,000**	
Bicycle Lanes[3]	Yamhill Street	North City Limits	Main Street	5,228	-	$561,000[4]	Yes[6]
	Pine Street	Main Street	Taylor Street	4,928	-	$529,000[4]	Yes[6]
	Main Street	West City Limits	Yamhill Street	3,712	-	$398,000[4]	Yes
	Main Street	Yamhill Street	Pine Street	1,340	-	NA	NO
	Main Street	Pine Street	East City Limits	5,678	-	$609,000[4]	Yes
	Polk Street	Pine Street	3rd Street	1,790	-	$192,000[4]	No[5]
	3rd Street	Main Street	Polk Street	2,692	-	$289,000[4]	No[5]
					Total	**$2,578,000**	
Multi-Use Path[3]	Railroad Right-of-Way	Taylor Street	Roosevelt Street	5,230	-	**$1,122,000**	Yes

[1] Combined length – both sides of street
[2] Assumes $6 per square foot sidewalk cost, $12 per linear foot curb & gutter cost, and $13 per square foot pavement cost, 15% ELA, 50% contingency.
[3] Assumes replacement of existing sidewalks where present at $6 per square foot, $13 per square foot pavement, 15% ELA, 50% contingency.
[4] Assumes replacement of existing sidewalks.
[5] Insufficient ROW to provide both on-street parking and bicycle lanes but bicycle lanes could be provided if parking restricted.
[6] ROW may not be sufficient if also adding left-turn lanes on Highway 47.

PUBLIC TRANSIT SYSTEM

The Oregon Public Transportation Plan (ODOT, 1997) described a preferred state of public transportation in 2015 to respond to state and federal goals, which established targets for service types and frequencies relevant to the City of Carlton. The plan identifies minimum levels of public transportation services which provide a range of services intended to keep pace with Oregon's changing and increasing public transportation needs. Minimum level of service recommendations were given by types of services, size of community, and distance from other major intermodal centers (only Portland in Oregon) or urban central cities. For planning purposes, communities are divided into large urban areas, small communities of 25,000 or more, small communities of 2,500 to 25,000, communities of 2,500 or more within 20 miles of an urban central city, and rural (<2,500) communities (ODOT, 1997). The population of Carlton was 1,500 in 1997, estimated to be 1,670 in 2007, and projected to be 2,485 in 2030; so during the 20-year planning horizon, Carlton will remain a rural community. The closest urban central city is Portland, which is 28 miles to the northeast.

According to the Oregon Public Transportation Plan, the goals for rural communities under 2,500 population and over 20 miles from an urban central city should include:

- Public transportation to general public based on locally established service and funding priorities.
- Accessible rides to anyone requesting services
- Coordinated, centralized scheduling system.
- Provide phone access to the scheduling system at least 40 hours weekly between Monday and Friday.
- Respond to service request within 24 hours, not necessarily provide a ride within 24 hours.

The existing public transit system meets each of these goals; however, the Existing and Future Conditions analysis found in Section 3, identified several system deficiencies specific to the City of Carlton's needs. The following identifies the City of Carlton's public transit deficiencies.

Public Transit Deficiencies

The public transit deficiencies identified in the previous section included the need for expanded regional and intercity commuter services, expanded transit frequency during Carlton Fun Days and peak wine tasting times, park-and-ride lots, as well as more widespread awareness of the existing Cherriots Rideshare carpool program.

Public Transit Alternatives

Expanded Transit Service

To address the above deficiencies, the City of Carlton will coordinate with the Yamhill County Transit Area District (YCTA) on increasing service to the City of Carlton and identify the potential local share or match that could facilitate increased service.

The need for a future transit stop in the vicinity of the intersection of N 4th Street/E Main Street will be monitored.

Event Transit Service

Increased transit and park-and-ride lots during Carlton Fun Days and peak wine tasting times will be addressed by a Carlton Event Management Plan or by local businesses during peak wine tasting times. The city will help coordinate local businesses to establish a shuttle and identify overflow parking areas during peak wine tasting times.

Cherriots Rideshare Program

The City of Carlton will work with rideshare programs to enhance the publicity of their service. Many activities such as local newspaper articles, postings and flyers in all public buildings, or information booth at a local event, can be completed by the City.

Public Transit Costs

Some of the costs to increase transit to Carlton by the YCTA may be capital and operational. The ability to use System Development Charges for these types of costs should be explored further.

SUMMARY OF TRANSPORTATION ALTERNATIVES

Three alternatives were identified for the roadway system. A set of desired improvements for the pedestrian and bicycle networks were identified and the desire to support additional transit service was also identified. The total costs to address the deficiencies identified on Main Street total approximately $279,000 for Alternative 1 and 3, approximately $1,112,000 for Alternative 2 and 3, and approximately $100,000 to complete Alternative 3 alone. The alternative selected to address the Main Street deficiencies may impact the number of additional improvements that are reasonably likely to be able to be completed within the 20-year horizon based on funding constraints. The additional costs identified to address the Highway 47 left-turn lane needs total $1,729,000, railroad right-of-way crossings totaled $165,000, pedestrian and bicycle priorities total $5,572,000. The total estimated transportation costs depending upon which Main Street Alternative is selected are shown in Table 4-9. *Details of the cost estimates are provided in Appendix N.*

Table 4-9 Total Planning Level Transportation Improvement Costs

Improvements	Alternative 1 +3	Alternative 2 + 3	Alternative 3
Main Street	$279,000	$1,112,000	$100,000
Highway 47	$1,729,000	$1,729,000	$1,729,000
Railroad Right-of-Way Crossings	$165,000	$165,000	$165,000
Pedestrian Priorities	$1,872,000	$1,872,000	$1,872,000
Bicycle Priorities	$2,578,000	$2,578,000	$2,578,000
Multi-use Path	$1,122,000	$1,122,000	$1,122,000
Transit Match	$275,000	$275,000	$275,000
Total	**$8,020,000**	**$8,853,000**	**$7,841,000**

Transportation Funding

The Existing and Future Conditions analysis found in Section 3, forecasts the following amounts of transportation funding for the 20-year planning horizon, shown in, the estimated 20-year forecast funds are significantly below the estimated transportation costs to address all of the identified deficiencies.

Table 4-10 Forecast Future Transportation Project Funding

	5-Year Forecast	10-Year Forecast	20-Year Forecast
ODOT	$308,000	$616,500	$1,233,500
City	$22,000	$44,000	$87,500
County	$1,500	$3,000	$6,500
TSDC	$369,000	$737,500	$1,475,000
Total	**$700,500**	**$1,401,000**	**$2,802,500**

Section 5
Preferred Plan and Financially Constrained Alternative

Preferred Plan and Financially Constrained Alternative

The previous section identified various alternatives to address the City's future transportation needs and deficiencies for the roadway, pedestrian, bicycle and public transit networks. These alternatives were reviewed to determine which Main Street alternative was the preferred alternative, and to prioritize the timeframe for completing additional roadway and multi-modal improvements included in the Preferred Transportation System Plan (*Preferred Plan*). The *Preferred Plan* described in this section is the City's preferred transportation system plan that will "establish a coordinated network of transportation facilities adequate to serve state, regional and local transportation" as required by the Oregon Transportation Planning Rule (TPR).

In addition to the *Preferred Plan,* the City also developed a "revenue forecast" transportation scenario, known as, the *Financially Constrained Alternative.* The *Financially Constrained Alternative* considers project priorities under a constrained financial scenario, where project costs are matched to the City's projected future transportation funds. The *Financially Constrained Alternative* provides further guidance on how to prioritize transportation projects listed in the *Preferred Plan* in the event that additional funding sources cannot be obtained to fill the $5.8 million funding gap between the financial forecast and the projected costs of the *Preferred Plan.* In the event that additional funding sources become available to complete projects included in the *Preferred Plan* but not in the *Financially Constrained Alternative,* the City may complete these projects before completing all of the projects listed in the *Financially Constrained Alternative.*

The *Preferred Plan* and the *Financially Constrained Alternative* presented in this section were developed based upon input from the project advisory committees and the public, and to meet the City's transportation goals and objectives. The City's four transportation goals, as identified in Section 2, include the following:

- Goal 1 – Preserve the function, capacity, level of service, and safety of State Highway 47.
- Goal 2 – Enhance the transportation mobility and safety on the local street system.
- Goal 3 – Increase the use of alternative modes of transportation (walking, bicycling, rideshare/carpooling, and transit) through improved access, safety, and service. Increasing the use of alternative transportation modes includes maximizing the level of access to all social, work, and welfare resources for the transportation disadvantaged. The City of Carlton seeks for its transportation disadvantaged citizens the creation of a customer-oriented regionally coordinated public transit system that is efficient, effective, and founded on present and future needs.
- Goal 4 – Improve coordination between the City of Carlton, Yamhill County, and the Oregon Department of Transportation (ODOT).

This section also describes the City's updated Roadway Functional Classification Map, Future Street Plan, street design standards, access control standards, and travel demand management measures.

PREFERRED PLAN

The *Preferred Plan* summarizes all of the roadway, pedestrian, bicycle, and transit improvements required to address the City of Carlton's transportation goals. No mitigations are required to meet the ODOT mobility standards along Highway 47; however geometric improvements have been identified to improve safety. Because none of the identified improvements are driven by a timeframe based on future volume projections, the projects were categorized as either short-, medium-, or long-term priority based on how they met the City's goals and to establish an order in which the projects could potentially be pursued. Figure 5-1 provides a map of the *Preferred Plan.* Table 5-1 through Table 5-4 summarize the improvements by mode and timeframe. *Appendix O provides brief summaries for each project.*

Table 5-1 identifies the roadway improvements in the *Preferred Plan* and each improvement's priority for development in the short, medium and long-term. The short-term priority projects are identified as projects that can be achieved relatively inexpensively and easily based on available right-of-way. The medium priority improvements are those that are necessary to fully address the City's goal of enhancing the pedestrian environment along Main Street and meeting ODOT's future need for left-turn lanes on Highway 47 at the cross-streets. The long-term priority projects are those that will be driven by development and are likely to be constructed by development.

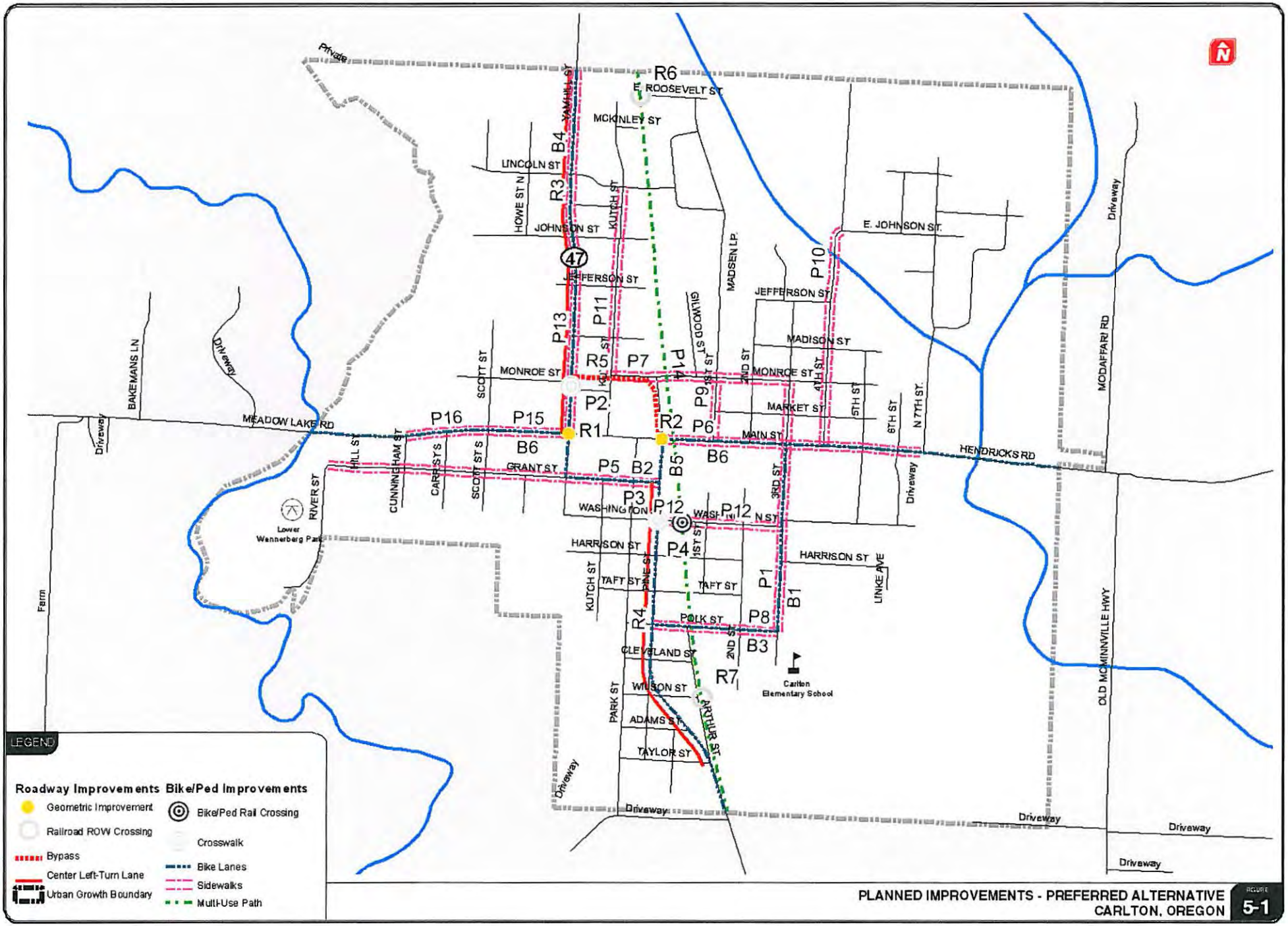
The City of Carlton supports the construction of the Main Street Bypass (Project Number R5) based upon the following conditions/design considerations:

- The bypass shall be designed for a speed not to exceed 25 miles per hour, with an intended posted speed not to exceed 20 miles per hour through the Business District;
- The bypass shall include pedestrian crossings that provide safe pedestrian access across Monroe and Pine streets and include pedestrian bulb-out areas;
- The Yamhill/Monroe street intersection should be constructed according to Bypass Option 2 as shown in *Appendix L.*

Table 5-1 Preferred Plan Roadway Improvements

Project Number	Location	Description	Cost[1]	Timeframe Priority
R1	Yamhill Street / W Main Street	Turning Radius Improvements	$50,000	Short
R2	Pine Street / W Main Street	Turning Radius Improvements	$50,000	Short
R3	N Yamhill Street (UGB to Main)	Install center left-turn lane	$827,327	Medium
R4	S Pine Street (Grant to UGB)	Install center left-turn lane	$902,403	Medium
R5	N Pine Street and W Monroe Street	Construct Main Street bypass	$868,414	Medium
R6	Roosevelt Street (at Railroad ROW)	Connect Roosevelt Street across railroad right-of-way	$85,800[2]	Long
R7	Wilson Street (at Railroad ROW)	Connect Wilson Street across railroad right-of-way	$60,060[2]	Long
Total			**$2,844,004**	
Total – Development Funded			**$2,698,144**	

[1] Does not include needed right-of-way acquisition.
[2] Anticipated to be funded by development.



PLANNED IMPROVEMENTS - PREFERRED ALTERNATIVE
CARLTON, OREGON

FIGURE 5-1

Pedestrian improvements for the *Preferred Plan* are identified in Table 5-2.

Table 5-2 Preferred Plan Pedestrian Improvements

Project Number	Location	Description	Cost[1]	Timeframe Priority
P1	3rd Street (Monroe to Polk)	Install sidewalks	$213,444	Short
P2	Highway 47 (at Monroe St)	Install crosswalks	$50,000	Short
P3	Highway 47 (at Washington St)	Install crosswalks	$50,000	Medium
P4	Washington Street (at Railroad ROW)	Provide ped/bike connection across railroad right-of-way	$19,305	Short
P5	W Grant Street (River to Pine)	Install sidewalks	$289,436	Short
P6	Main Street (1st to 7th)	Install sidewalks	$238,729	Short
P7	Monroe Street (Kutch to 3rd)	Install sidewalks	$161,726	Short
P8	Polk Street (Pine to 3rd)	Install sidewalks	$132,066	Medium
P9	N 1st Street (Monroe to Main)	Install sidewalks	$72,864	Medium
P10	N 4th Street (Johnson to Main)	Install sidewalks	$253,440	Short
P11	N Kutch Street (Lincoln to Monroe)	Install sidewalks	$127,376	Short
P12	Washington Street (Pine to 3rd)	Install sidewalks	$119,295	Medium
P13	N Yamhill Street (UGB to Main)	Install sidewalks	$389,902	Long
P14	Railroad right-of-way	Construct multi-use path along right-of-way	$517,770	Long
P15	W Main Street (Scott to Yamhill)	Install sidewalks	$91,872	Medium
P16	W Main Street (Cunningham to Scott)	Install sidewalks	$92,664	Long
Total			**$2,819,889**	

[1] Does not include needed right-of-way acquisition.

Pedestrian improvements in the *Preferred Plan* were prioritized as short-, medium-, and long-term projects according to their relative importance to the transportation system. Improvements that establish vital connections and improve safety are given the highest priority to complete in the short term. For example, pedestrian improvements on 3rd Street, Washington Street, Grant Street, and Main Street would strengthen connections to major attractors, such as Carlton Elementary School and Wennerberg Park. Crosswalks on Highway 47 are also prioritized, as they improve pedestrian safety along the busiest roadways in the City.

Table 5-3 lists the bicycle improvements identified in the *Preferred Plan*.

Table 5-3 Preferred Plan Bicycle Improvements

Project Number	Location	Description	Cost[1]	Timeframe Priority
B1	3rd Street (Main to Polk)	Install bike lanes	$288,776	Short
B2	Grant Street (Yamhill to Pine)	Install bike lanes	$144,144	Medium
B3	Polk Street (Pine to 3rd)	Install bike lanes	$192,037	Short
B4	N Yamhill Street (UGB to Grant)	Install bike lanes	$625,291	Medium
B5	S Pine Street (Main to Taylor)	Install bike lanes	$529,122	Long
B6	Main Street (excluding Hwy 47)	Install bike lanes	$1,007,493	Long
Total			**$2,786,863**	

[1] Does not include needed right-of-way acquisition.

Bicycle priorities identified in Table 5-3 were based on timing, their relative importance to the transportation system, and cost given their relatively high costs compared to the pedestrian projects. With the costs of the majority of the medium- and long term priority projects, several pedestrian projects could be completed instead. Third Street and Grant Street are identified as a priority to complete in the short-term to coincide with the short-term priority pedestrian projects along the same corridors.

The list of transit system improvements for the *Preferred Plan* are identified in Table 5-4. The *Preferred Plan* provides funding for transit through a local match to the Yamhill County Transit Area. Building a bus stop on Main Street is identified as a lower priority as it will be driven by development in the City.

Table 5-4 Preferred Plan Transit Improvements

Project Number	Type	Description	Cost[1]	Timeframe Priority
T1	Transit Match	Provide local match funds to expand YCTA service in Carlton	$275,000	Medium
T2	Transit Stop	Construct transit stop on Main Street between 4th Street and 7th Street	$25,000[2]	Development driven
Total			$300,000	

[1] Does not include needed right-of-way acquisition.

[2] Included as long-term costs in Table 5-5

Project Prospectus Sheets

Appendix O includes a prospectus sheet for each project listed in the Preferred Plan. The prospectus sheets provide a summary of each project, which includes information such as: a description of each project, the estimated project cost, a map and aerial photograph of the project location, right-of-way acquisition needs, and a figure of the typical street cross-section (if applicable). The prospectus sheets provide valuable information needed for further project planning and design, and can help evaluate what additional steps are needed to make a project ready for development.

Preferred Plan Total Improvement Costs

The total cost of the transportation improvements contained in the *Preferred Plan* is approximately $8.60 million, as shown in Table 5-5. The cost estimates for the improvements listed in the *Preferred Plan* do not include needed right-of-way acquisition.

Table 5-5 Total Planning Level Transportation Improvement Costs

Type	Long-term	Medium-term	Short-term	Total
Roadway	$150,000	$1,771,971	$776,171	$2,698,142
Pedestrian	$1,323,796	$588,421	$907,672	$2,819,889
Bicycle	$480,813	$769,435	$1,536,615	$2,786,863
Transit	-	$275,000	$25,000	$300,000
Total	**$1,954,609**	**$3,404,827**	**$3,245,458**	**$8,604,894**

The transportation improvement costs in Table 5-5 include all projects identified in the *Preferred Plan* and represent an ideal scenario. As shown in Table 5-5, costs for roadway, pedestrian, and bicycle projects are spread approximately evenly, with significantly less identified for transit.

The costs in Table 5-5 can be compared to Table 5-6, which illustrates the total projected funds available within the 20-year forecast. The approximately $2.8 million identified in Table 5-6 leaves a funding gap of approximately $5.8 million between the financial forecast and the projected costs of the *Preferred Plan*.

Table 5-6 Forecast Future Transportation Funding

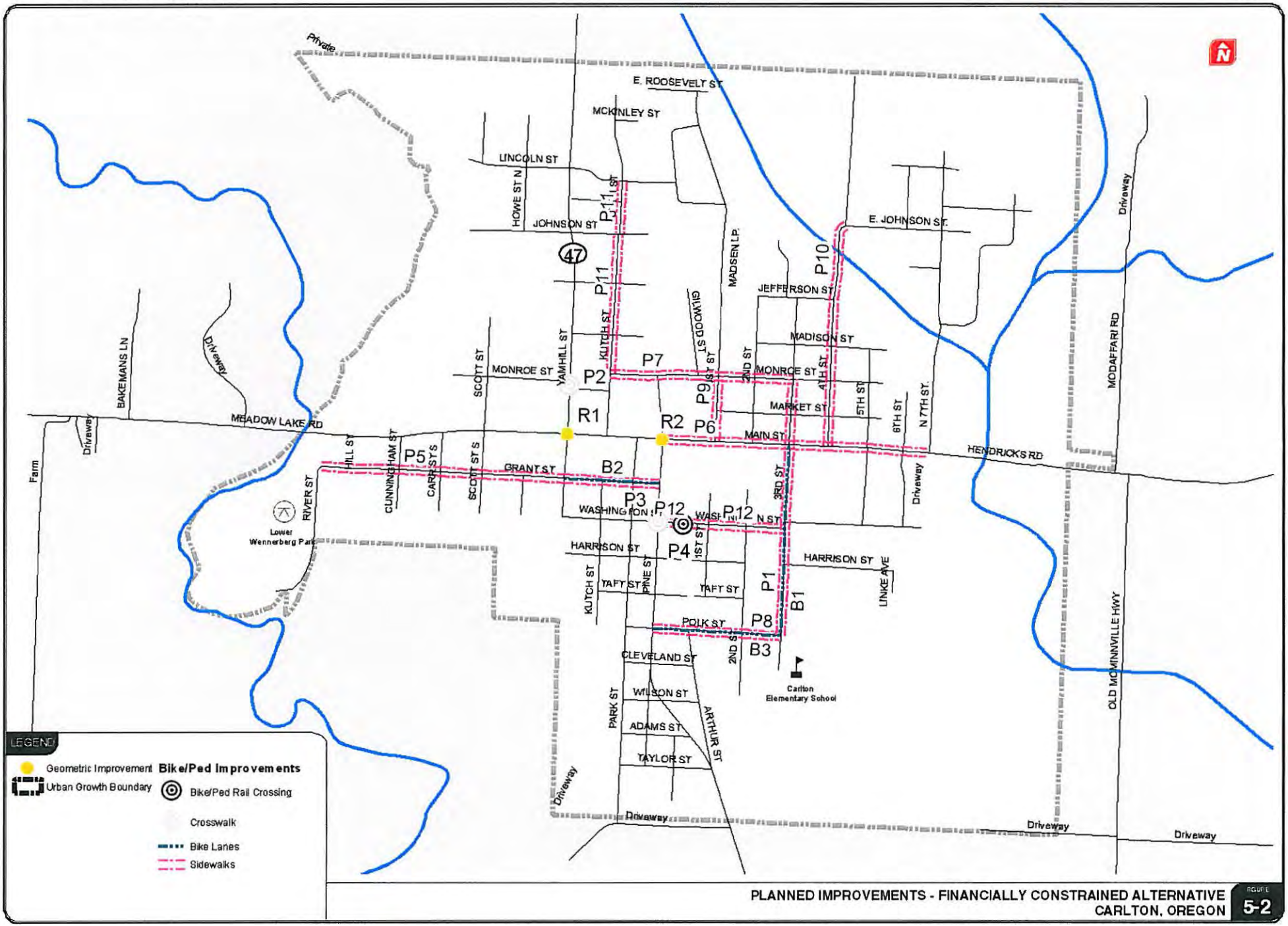
	5-Year Forecast	10-Year Forecast	20-Year Forecast
ODOT	$308,000	$616,500	$1,233,500
City	$22,000	$44,000	$87,500
County	$1,500	$3,000	$6,500
TSDC	$369,000	$737,500	$1,475,000
Total	**$700,500**	**$1,401,000**	**$2,802,500**

FINANCIALLY CONSTRAINED ALTERNATIVE

As shown in tables 5-5 and 5-6 above, the estimated costs to construct the *Preferred Plan* far exceed the projected future transportation funding. Therefore, in order to describe a more likely future transportation system, a *Financially Constrained Alternative* for the future transportation system was identified. The *Financially Constrained Alternative* considers project prioritization and costs and attempts to match them to the projected transportation funding flows while addressing as many of the City's transportation goals as possible. The *Financially Constrained Alternative* provides further guidance on how to prioritize transportation projects listed in the *Preferred Plan* in the event that additional funding sources cannot be obtained to fill the $5.7 million funding gap between the financial forecast and the projected costs of the *Preferred Plan*. In the event that additional funding sources become available to complete projects included in the *Preferred Plan* but not in the *Financially Constrained Alternative*, the City may complete these projects before completing all of the projects listed in the *Financially Constrained Alternative*.

The *Financially Constrained Alternative* identifies the near-term, mid-term, and long-term roadway, pedestrian, bicycle, and transit improvements that can be achieved within the transportation funding forecast. The *Financially Constrained Alternative* was developed by the project team with guidance from the Technical Advisory Committee, Citizen Advisory Committee and feedback received during the public hearings process. The timelines are identified based on the timeframe priorities identified for the *Preferred Plan* above, project costs, city goals, and the projected funding flows. For example, if the projected funding was only sufficient to accomplish the short-term projects, those projects were further prioritized into projects that would be completed in the near term (0-5 years), mid-term (5-10 years) or long-term (10-20 years) based on the assumption that the forecast funding would be spread out evenly among the next twenty years. Figure 5-2 provides a map of the *Financially Constrained Alternative*.

The downtown bypass was omitted from the *Financially Constrained Alternative* in order to meet more of the City's overall goals including the enhancement of the pedestrian and bicycle system as the bypass would consume a significant amount of the projected funding. However, the short-term roadway improvements were included in the *Financially Constrained Alternative*. The remaining funding was allocated to pedestrian, bicycle, and transit projects. These specific, non-auto projects are selected based on the project priorities identified for the *Preferred Plan*. The project priorities and list of projects on the *Financially Constrained Alternative* were completed with input from the public, the project Technical Advisory Committee, and the Citizens Advisory Committee. Table 5-7 through Table 5-10 summarize the *Financially Constrained* projects by mode and time frame.



PLANNED IMPROVEMENTS - FINANCIALLY CONSTRAINED ALTERNATIVE
CARLTON, OREGON

FIGURE 5-2

Table 5-7 Financially Constrained Alternative Roadway Improvements

Project Number	Location	Description	Cost[1]	Timeframe
R1	Yamhill Street / W Main Street	Turning Radius Improvements	$50,000	0-5 years
R2	Pine Street / W Main Street	Turning Radius Improvements	$50,000	0-5 years
Total			**$100,000**	

[1] Does not include needed right-of-way acquisition.

The *Financially Constrained Alternative* for roadway improvements identified in Table 5-7 includes turning radius improvements on Main Street. Fixing the constrained turning movements on Main Street is a priority in this alternative. The bypass and left-turn roadway improvements are omitted in order to provide more resources for non-auto improvements.

Table 5-8 Financially Constrained Alternative Pedestrian Improvements

Project Number	Location	Description	Cost[1]	Timeframe
P1	3rd Street (Monroe to Polk)	Install sidewalks	$213,444	0-5 years
P2	Highway 47 (at Monroe St)	Install crosswalks	$50,000	0-5 years
P3	Highway 47 (at Washington St)	Install crosswalks	$50,000	5-10 years
P4	Washington Street (at Railroad ROW)	Provide ped/bike connection across railroad right-of-way	$19,305	5-10 years
P5	W Grant Street (River to Pine)	Install sidewalks	$289,436	5-10 years
P6	Main Street (1st to 7th)	Install sidewalks	$238,729	5-10 years
P7	Monroe Street (Kutch to 3rd)	Install sidewalks	$161,726	10-20 years
P8	Polk Street (Pine to 3rd)	Install sidewalks	$132,066	10-20 years
P9	N 1st Street (Monroe to Main)	Install sidewalks	$72,864	10-20 years
P10	N 4th Street (Johnson to Main)	Install sidewalks	$253,440	10-20 years
P11	N Kutch Street (Lincoln to Monroe)	Install sidewalks	$127,376	10-20 years
P12	Washington Street (Pine to 3rd)	Install sidewalks	$119,295	10-20 years
Total			**$1,727,681**	

[1] Does not include needed right-of-way acquisition.

The *Financially Constrained Alternative* for pedestrian improvements is identified in Table 5-8 and includes as many improvements as possible while balancing the needs of the other modes, according to priorities identified in the *Preferred Plan*. Almost all of the pedestrian improvements identified in the *Preferred Plan* are included in this plan with the exception of North Yamhill Street and the multi-use path along the railroad right-of-way.

Table 5-9 Financially Constrained Alternative Bicycle Improvements

Project Number	Location	Description	Cost[1]	Timeframe
B1	3rd Street (Main to Polk)	Install bike lanes	$288,776	0-5 years
B2	Grant Street (Yamhill to Pine)	Install bike lanes	$144,144	10-20 years
B3	Polk Street (Pine to 3rd)	Install bike lanes	$192,037	5-10 years
Total			**$624,957**	

[1] Does not include needed right-of-way acquisition.

Bicycle improvements identified in

Table 5-9 are based on timeframe priorities in the *Preferred Plan* while balancing costs with other modes. Only the bicycle improvements providing direct access to the elementary school and providing a by-pass to Highway 47 along Main Street are included.

Table 5-10 Financially Constrained Alternative Transit Improvements

Project Number	Type	Description	Cost[1]	Timeframe
T1	Transit Match	Provide local match funds to expand YCTA service in Carlton	$275,000	5-10 years
T2	Transit stop	Construct transit stop on Main Street between 4th and 7th	$25,000[2]	Development driven
Total			$300,000	

[1] Does not include needed right-of-way acquisition.

[2] Included as long-term costs in Table 5-11

The overall cost of transit improvements in the *Preferred Plan* is relatively low when compared with other modes, and as such they are all included in the *Fiscally Constrained Alternative,* as shown in Table 5-10. They type and amount of additional transit service that can be provided with $275,000 is unknown but this number is approximately ten percent of the projected project funding.

Financially Constrained Alternative Total Improvement Costs

The total cost of the transportation improvements contained in the *Financially Constrained Alternative* are constrained to the financial forecast of approximately $2.8 million, as shown in Table 5-11. The cost estimates for the improvements listed in the *Financially Constrained Alternative* do not include needed right-of-way acquisition.

Table 5-11 Financially Constrained Planning Level Transportation Improvement Costs

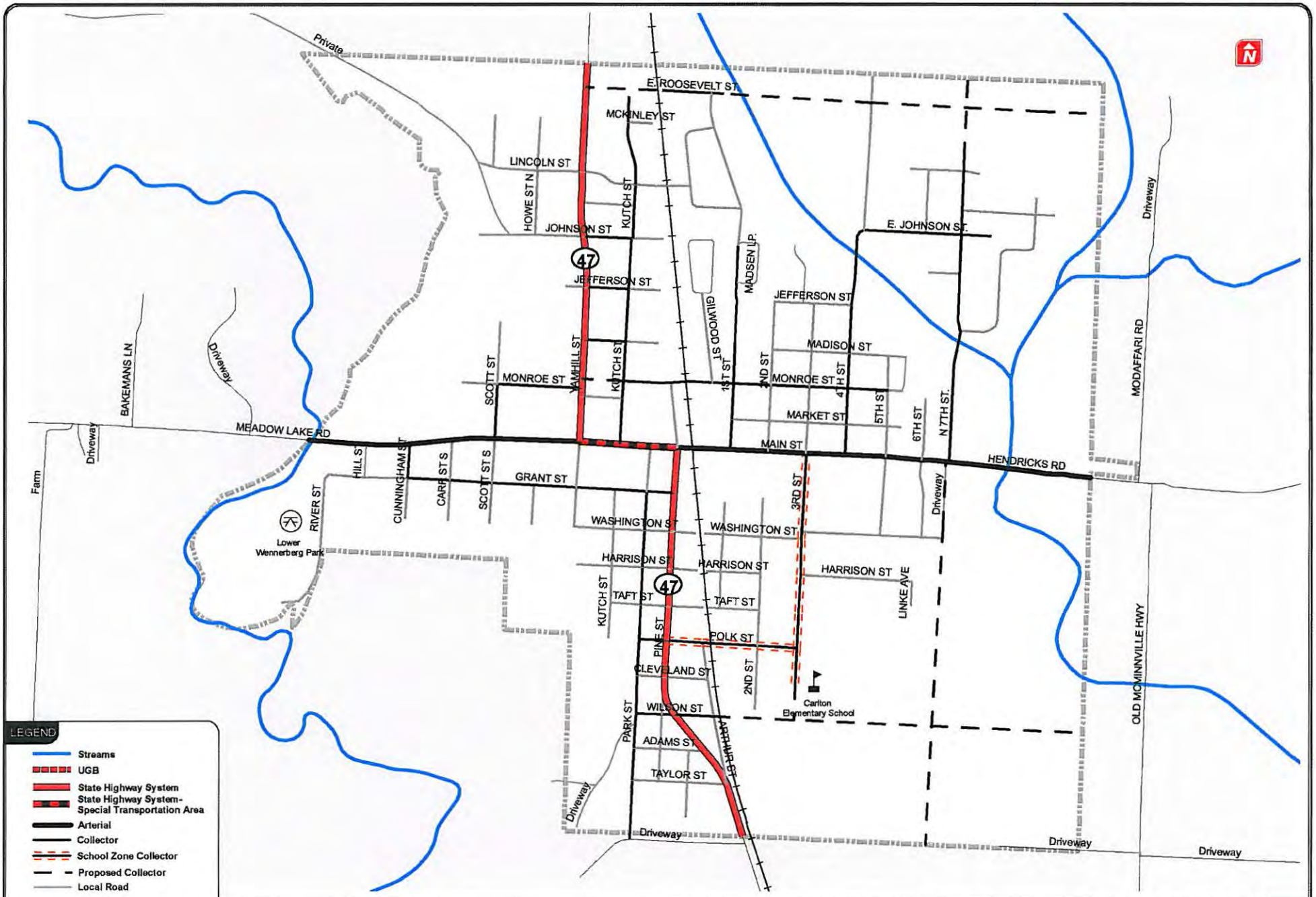
Type	0-5 Years	5-10 Years	10-20 Years	Total
Roadway	$100,000	-	-	$100,000
Pedestrian	$263,444	$597,470	$866,767	$1,727,681
Bicycle	$288,776	$144,144	$192,037	$624,957
Transit	-	$275,000	$25,000	$300,000
Total	**$652,220**	**$1,016,614**	**$1,083,804**	**$2,752,638**

ROADWAY FUNCTIONAL CLASSIFICATIONS

A review of existing roadway functional classifications was completed as part of the Existing and Future Conditions analysis found in Section 3. Based on that review, the following roadway sections were upgraded from local street to collector classification based on the connectivity they provide and relationship to access and railroad right-of-way crossings:

- 1st Street from Roosevelt Street to Main Street
- Kutch Street from Johnson Street to Roosevelt Street
- Kutch Street from Main Street to Monroe Street
- Johnson Street from 4th Street to 7th Street
- Wilson Street from Pine Street to Arthur Street

There is no cost associated with these changes; however, the new classification will be applied as new development occurs and as roadway, pedestrian, and bicycle improvements are made. The updated Roadway Functional Classification Map is shown in Figure 5-3.



ROADWAY FUNCTIONAL CLASSIFICATIONS
CARLTON, OREGON

FUTURE STREET PLAN

The purpose of the Future Street Plan is to identify future right-of-way that the City of Carlton may need in order to have and maintain, as much as possible, a balanced street network in accordance with the Oregon Transportation Planning Rule (TPR). The plan designates:

1. where existing collector/arterials could be extended or new ones could be added;
2. where new local access streets and/or pedestrian ways could be located to provide better connection between existing streets (grid infill); and
3. where new local access streets could be located to provide adequate connection to significant local destinations for both automobiles and pedestrians.

Locations for the right-of-way and improvements were identified based on review of the existing street grid, existing parcel boundary locations, physical constraints (such as steep slopes and floodways that might preclude economical road construction) and access management guidelines for access onto major arterials.

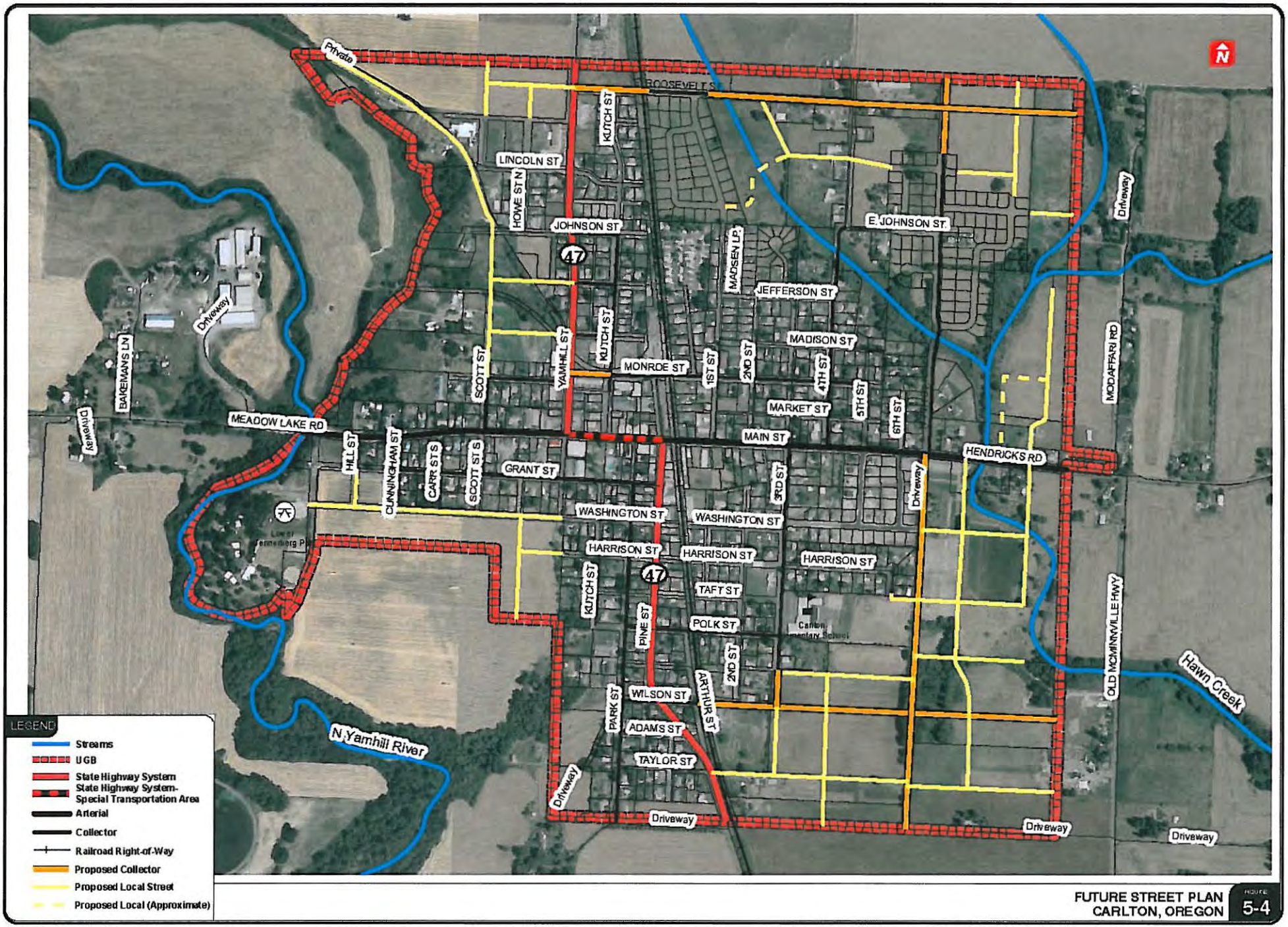
Future Street Locations

Figure 5-4 provides a map of the Future Street Plan, which shows the extensions of the local and collector street network. All of the future roadways are anticipated to be local roadways with the exception of two roadways that have been identified as future collector roadways. They include the east extension of Wilson Street and the southern extension of 7th Street.

Needed rights-of-way for the City have been placed along current parcel boundaries as much as possible to facilitate dedication as development occurs. Existing parcels have been traversed (where necessary) in a configuration that should be conducive to future development (almost always at 90-degree angles). The grid sizes vary to accommodate existing structures and property line locations. In some cases the extensions have been offset to avoid existing development.

Depending on future lot sizes, additional local road(s) may be needed within the identified grids to access all of the lots. Layout of internal roads should remain flexible and be performed by local developers to suit market and site constraints. However, suitable pedestrian access ways to all sides of the grid are required to the maximum extent possible.

The future street plan will continue to be refined, as development occurs, and the site constraints and opportunities of each property are addressed. The plan is intended to provide some flexibility in alignments and primarily serve to define the desired level of connectivity in each area. The maximum block length and perimeter standards found in the City's Development Code provide a consistent tool to evaluate modifications to the future street plan as development occurs. For example, the typical block length in Carlton is less than 300 feet. The City's maximum block length standard of 600 feet and maximum block perimeter of 1,400 feet (in residential and commercial districts) would allow for some blocks to be long but would not allow for long blocks to occur on all four sides of a square block.



FUTURE STREET PLAN
CARLTON, OREGON

FIGURE 5-4

Future Street Plan - Stream Crossings

During the development of the Future Street Plan, consideration was given to limiting the number of additional stream crossings. Two additional crossings are identified in the northeast quadrant and one is identified in the southeast quadrant. The area of land north of Main Street and east of the stream will have access to Main Street only but the development pattern to the west of the properties does not provide a logical connection location and a connection to the north would not provide the benefit to justify the cost of a stream crossing.

STREET DESIGN STANDARDS

Figure 5-5 illustrates the updated Street Design Standards. The arterial network in Carlton includes Main Street and Highway 47 only. The Main Street portion of Highway 47 has a standard equal to the existing cross-section. Highway 47 north and south of Main Street has a three-lane standard cross-section with bicycle lanes and sidewalks. Main Street east and west of Highway 47 has a two-lane cross-section with bicycle lanes and sidewalks.

On collector roadways, bicycle lanes are identified only on the new collector roadways including Roosevelt Street, Wilson Street, and 7th Street. In order to minimize the paved width on the new collector roadways the travel lanes and on-street parking widths have been reduce from the typical collector standard. Bicycle lanes are also included on Yamhill Street from Main Street to Grant Street and on Grant Street from Yamhill Street to Pine Street to provide cyclists with a by-pass route to the Main Street portion of Highway 47. Further, to serve the school, bicycle lanes are also identified on 3rd Street from Main Street to Polk Street and Polk Street from Pine Street to 3rd Street. This cross-section is identified in Figure 5-5 as the School Zone Collector Street. This cross-section does not have on-street parking due to right-of-way constraints; however, on-street parking will be allowed and included during a design phase if right-of-way is available.

All roadways in commercial areas (local, collector, or arterial) will have 10-foot wide sidewalks, regardless of roadway classification.

Landscape strips are included as part of the New Street Collector standard and are optional on both of the local street standards. Landscape strips are not required or included as standard on the rest of the roadway system given right-of-way constraints throughout much of the City. Where landscape strips are installed, they will be maintained by the associated development.

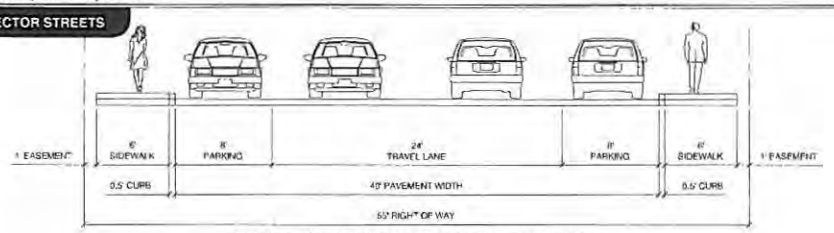
Table 5-12 summarizes the street design standards.

Table 5-12 Street Design Standards

Street Classification		ROW Width (ft)	Pavement Width (ft)	Sidewalk Width (ft)	Landscape Strip (ft)	Bikeway Width (ft)	Parking
Local	**Typical**	47-57	34	5 [1]	5 (optional)	N/R	2 sides
	Commercial/Industrial Districts	60	36	5 [1]	5 (optional)	N/R	2 sides
	Local Narrow Option [2]	39-49	26	5	5 (optional)	N/R	1 side
Collector	**Existing Street**	55	40	6 [1]	N/R	None [4]	2 sides
	New Street	71	46	6 [1]	5	5	2 sides
	School Zone [3]	49	34	6	N/R	5	None [5]
Arterials	**Highway 47 (N. and S. of Main St.)**	65	50	6 [1]	N/R	6	None
	Highway 47 (Main Street - STA)	60	40	10	N/R	None	2 sides
	Main Street (E. and W. of Highway 47)	65	50	6 [1]	N/R	5	2 sides
Alley		20	12 feet	N/R	N/R	N/R	N/R
Cul-de-sac bulb		45 foot radius	38 foot radius	5	N/R	N/R	N/R

[1] Ten-foot sidewalks required along commercially zoned property.
[2] Local narrow option allowed in residential areas only that provide access to 19 or fewer dwelling units.
[3] Applies to 3rd Street from Main Street to Polk Street and Polk Street from Pine Street to 3rd Street.
[4] Bicycle lanes required on Grant Street from Yamhill Street to Pine Street and Yamhill Street from Main Street to Grant Street.
[5] On-street parking permitted to be included during design phase where ROW available.

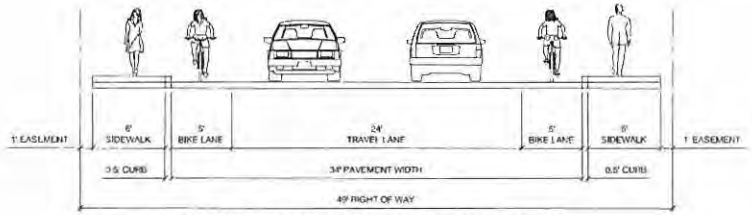
COLLECTOR STREETS



Existing Street Collector Standard Cross-Section

* Sidewalks along commercially zoned property to be 10ft wide resulting in 65ft of ROW and 32.5ft of half street ROW

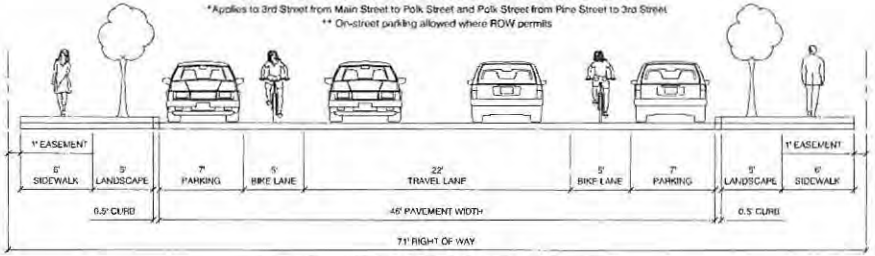
** Bike lanes required on Grant Street from Yamhill Street to Pine Street resulting in 65ft of ROW and 32.5ft of half street ROW or 37.5ft of half street ROW along commercially zoned property



School Zone Collector Street Standard Cross-Section

* Applies to 3rd Street from Main Street to Polk Street and Polk Street from Pine Street to 3rd Street

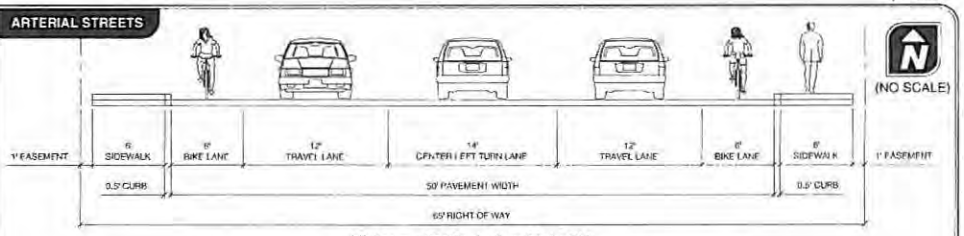
** On-street parking allowed where ROW permits



New Street Collector Standard Cross-Section

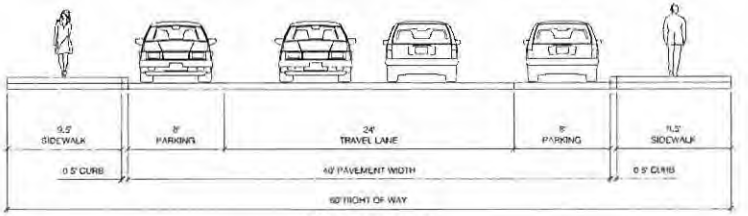
* Sidewalks along commercially zoned property to be 10ft wide resulting in 79ft of ROW and 39.5ft of half street ROW

ARTERIAL STREETS



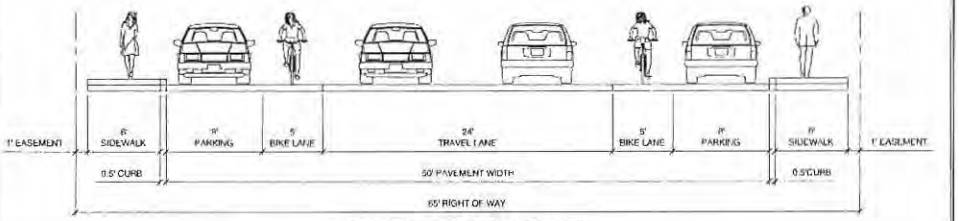
Highway 47 (Excluding Main St.)

* Sidewalks along commercially zoned property to be 10 feet wide resulting in 73ft of ROW and 36.5ft of half street ROW



Main St.(Hwy 47)

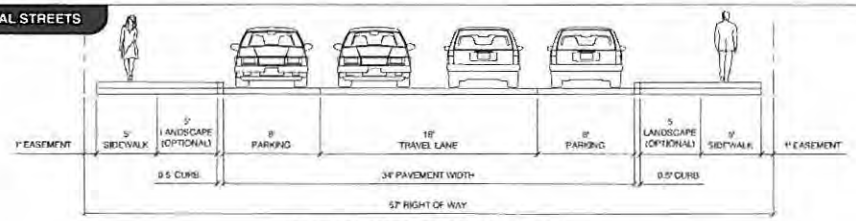
(Standard intended to be equal to existing cross-section)



Main Street (Excluding Hwy 47)

* Sidewalks along commercially zoned property to be 10 feet wide resulting in 73ft of ROW and 36.5ft of half street ROW

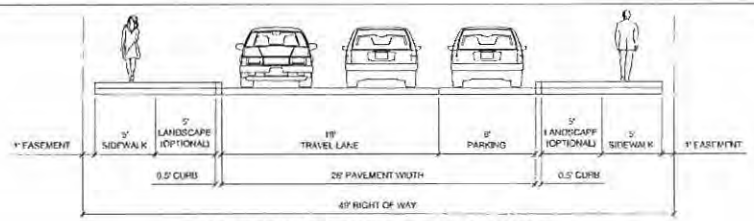
LOCAL STREETS



Local Street Standard Cross-Section

* Sidewalks along commercially zoned property to be 10 feet wide resulting in 57ft of ROW and 28.5ft of half street ROW

** Bike lanes and 10ft sidewalks required on Yamhill Street from Main Street to Grant Street resulting in 67ft of ROW and 33.5ft of half street ROW



Local "Skinny" Street Standard Cross-Section

* Parking allowed on both sides if driveways are staggered and not aligned across street from each other

(NO SCALE)

TYPICAL CROSS SECTIONS
CARLTON, OREGON

FIGURE 5-5

ACCESS MANAGEMENT

Access management is the process in which access to land development is balanced with the need for safe and efficient traffic flow of the roadway system. Access management standards are closely associated with the functional classification of a roadway. Typically, along state highways and arterials, the frequency of driveways and intersecting streets is more restrictive because the movement of traffic usually takes a higher priority. Along collector streets, access standards are less restrictive than along arterials and state highways to allow a greater balance between access and mobility. Access standards along local streets are restricted by safety considerations, as property access is the primary function of these streets.

The City of Carlton has one (1) state highway (Highway 47). Within the Special Transportation Area (STA) of Highway 47 (Main Street between Yamhill to Pine Street), the access spacing standard is the existing city block spacing for streets and 175 feet or mid-block for driveways if the existing block is less than 350 feet. For the portion of Highway 47 located between the north city limits to Yamhill Street there is a minimum 600-foot minimum spacing requirement. From the south city limits to Main Street there is a minimum spacing of 450 where the posted speed limit is 20 miles per hour and 600 feet where the posted speed limit is 30 mph.

Currently Carlton only has one (1) arterial street, which is the portion of Main Street located outside of the Highway 47 Special Transportation Area (STA). The minimum access spacing standard for arterials is 220 feet for street intersections, and 110 feet or mid-block for driveways if the existing block is less than 220 feet.

The remaining streets within Carlton are either collector or local streets. The collector streets primarily serve residential areas and serve as neighborhood collectors rather than full collectors. Therefore, the collectors have only a slightly more restrictive standard than the local streets. The access spacing standard for collectors is 75 feet. The access spacing standard for local streets is 50 feet between driveways. Table 5-13 summarizes the access spacing standards for each roadway classification.

Table 5-13 Access Spacing Standards

Function Street Classification	Posted Speed Range	Minimum Spacing Between Driveways and/or Streets
Highway 47		
Yamhill to Pine Street (STA Designation)	20 mph	Streets: Existing city block spacing Driveways: 175 feet or mid-block if block is less than 350 feet.
North city limits to Main Street	30 mph	600 feet
South city limits to Main Street	20 mph 30 mph	450 feet 600 feet
Arterial	25-35 mph	Streets: 220 feet Driveways: 110 feet or mid-block if block is less than 220 feet
Collector	20-25 mph	75 feet
Local	20-25 mph	50 feet

TRAVEL DEMAND MANAGEMENT

The Transportation System Plan will enhance the number of pedestrian and bicycle facilities and provide funding to increase transit service throughout Carlton. In order to ensure that these options are utilized, this section identifies a variety of Travel Demand Management measures to reduce the number of vehicle trips on the system and encourage use of the other modes.

The following Travel Demand Management programs will be implemented in Carlton:

Event Transit Service

City of Carlton will have an Event Management Plan that coordinates with local businesses to increase transit and shuttle service and the use of park-and-ride and overflow parking lots during festivals and peak wine tasting times.

Rideshare Program

The City of Carlton will work with area's rideshare program to enhance the publicity of their service. Publicity activities could include local newspaper articles, postings and flyers in all public buildings, or information booth at a local event.

Promote Walking and Bicycle School Trips

The City of Carlton will work with the school district to promote walking and bicycle trips to the elementary school and high school bus stops. Assistance may be available through the Safe Routes to School Program to assist with this outreach.

SUMMARY

The *Preferred Plan* provides a comprehensive set of projects to address the City's goals for the Transportation System Plan. However, the total costs of the *Preferred Plan* far exceed the projected transportation funding over the twenty-year horizon of the plan. The *Financially Constrained Alternative* uses the identified project priorities to establish a set of projects that is a more likely future scenario based on projected funding, while still addressing as many of the City's goals as possible.

Additional elements of the TSP, include an updated Roadway Functional Classification Map, Future Street Plan, Street Design Standards, Access Management Standards and Travel Demand Management measures.

Section 6
Implementation of the Transportation System Plan

Implementation of the Transportation System Plan

This section includes a description of the actions needed to implement the Transportation System Plan (TSP). These actions include the development of a Transportation Financing Program that identifies funding sources and strategies to complete the transportation improvement projects included in the TSP. These actions also include the development of transportation policies and land use regulations that are designed to enable and carry out the requirements of the TSP.

TRANSPORTATION FINANCING PROGRAM

The previous section identified a list of planned transportation facilities and major improvements, provided a general estimate of the priority and timing of improvements, and provided conceptual capital cost estimates. The following section provides an overview of existing and anticipated funding sources and identifies additional strategies for funding capital projects.

Preferred Plan Costs

Table 6-1 provides an overview of the transportation improvements identified for the *Preferred Plan*. As shown, the total cost of the *Preferred Plan* is approximately $8.60 million.

Table 6-1 Total Planning Level Transportation Improvement Costs

Type	High Priority	Medium Priority	Low Priority	Total
Roadway	$100,000	$1,771,971	$826,171	$2,698,142
Pedestrian	$1,323,796	$588,421	$907,672	$2,819,889
Bicycle	$480,813	$769,435	$1,536,615	$2,786,863
Transit	-	$275,000	$25,000	$300,000
Total	**$1,904,609**	**$3,404,827**	**$3,295,458**	**$8,604,894**

Projected Transportation Funding

The Existing and Future Conditions section documented the funding sources of transportation projects within the City of Carlton over the previous fifteen years. The total dollar value of these projects in year 2007 dollars is approximately $995,500. None of the past funding sources have been from dedicated funds. The majority of transportation projects over the past fifteen years were funded by grants administered by ODOT including the Small Cities Allotment (SCA) Grant. Improvements within the downtown commercial area were funded by a Community Development Block Grant (CDBG) and Quick Fix Grant through ODOT.

An average of approximately $66,365 per year in 2007 dollars has been spent within the City of Carlton on transportation projects; approximately $61,665 per year of which have historically been provided by ODOT and ODOT Grants. The City of Carlton has provided approximately $4,375 per year on average for transportation projects while Yamhill County has provided approximately $325 per year. An estimate of future funding was made by looking at past funding sources and projecting them in to the future. Table 6-2 provides a summary of the estimated future project funding (in year

2007 dollars) over the next five, ten, and twenty years based on an assumed average funding level of approximately $66,365 per year from the three agencies combined (the forecast numbers are cumulative). As shown in Table 6-2, approximately $1,327,500 is projected to be available over the next twenty years for transportation projects based on historic funding levels from the City, County, ODOT and ODOT Grants.

Table 6-2 Future Transportation Project Funding

	5-Year Forecast	10-Year Forecast	20-Year Forecast
ODOT	$308,000	$616,500	$1,233,500
City	$22,000	$44,000	$87,500
County	$1,500	$3,000	$6,500
Total	**$331,500**	**$663,500**	**$1,327,500**

There is a pavement preservation project planned for Highway 47 that starts approximately 2.9 miles north of the city limits and extends to the southern city limit. The total project cost estimate is $2,900,000. ODOT's current Statewide Transportation Improvement Program (STIP) allocated funds for preliminary engineering for this project. Construction of the project is anticipated to be in the next STIP with construction anticipated in 2013 - 2014. It is unknown how this project may impact the projected future project funding and ability to receive grant money that has been received historically. Because this will be a Statewide Transportation Improvement Plan (STIP) project, it is assumed for planning purposes that this will not impact the availability for the City to obtain grant funds from ODOT as is typical of past funding.

Potential SDC Funds

The City of Carlton is developing a Transportation System Development Charge (TSDC) to help fund future transportation improvements. For illustrative purposes an estimate of potential future SDC funds was made to demonstrate the impacts of the TSDC to the *Financially Constrained Alternative* project list. Ultimately, the TSDC rate will need to be determined by City Council by evaluating the benefits and tradeoffs to the *Financially Constrained Alternative* project list. *SDCs can only be used to address growth-related transportation needs.* SDCs cannot be used to fund any existing transportation deficiencies therefore the policy framework and methodology will need to identify the growth component of the pedestrian and bicycle improvements and the *Financially Constrained Alternative* project list will need to be reevaluated.

Assuming a future TSDC rate of $250 per daily trip[9] and future growth in trips of approximately 5,900[10] daily trips from projected development, future funds from a TSDC program would be

[9] A review of TSDC rates for small cities indicates a range of $100 to $500 per daily trip. Source: Don Ganer.

approximately $1,475,000. This equates to approximately $73,750 per year over the next twenty years, more than doubling the projected transportation funding. The estimated TSDC funds and resulting total transportation funds over the next five, ten, and twenty years are shown in Table 6-3. As shown in Table 6-3, with TSDC funds based on $250 per daily trip, approximately $2.8 million of transportation funds could be available over the next twenty years.

Table 6-3 Future Transportation System Development Charge Funding

	5-Year Forecast	10-Year Forecast	20-Year Forecast
Projected ODOT, City, and County Funds	$331,500	$663,500	$1,327,500
Potential TSDC Funds	$369,000	$737,500	$1,475,000
Total Funds	**$700,500**	**$1,401,000**	**$2,802,500**

Financially Constrained Alternative

The above funding levels were used to create the *Financially Constrained Alternative* presented in the previous section. Table 6-4 identifies the funding by project type for the short-term (0-5 years), medium-term (5-10 years), and long-term (10-20 years) horizons.

Table 6-4 Financially Constrained Planning Level Transportation Improvement Costs

Type	0-5 Years	5-10 Years	10-20 Years	Total
Roadway	$100,000	-	-	$100,000
Pedestrian	$263,444	$597,470	$866,767	$1,727,681
Bicycle	$288,776	$144,144	$192,037	$624,957
Transit	-	$275,000	$25,000	$300,000
Available	$700,500	$700,500	$1,401,000	$2,802,000
Total	**$652,220**	**$1,016,614**	**$1,083,804**	**$2,752,638**

Between the *Preferred Plan* and *Financially Constrained Alternative* there is an approximately $5.8 million funding gap. If this gap were to be financed through TSDCs alone, the TSDC rate would need to be increased by $992 per weekday trip above the estimated $250 per weekday trip rate to approximately $1,242 per weekday trip[11].

The Final *Financially Constrained Alternative* will need to be revised based upon the final TSDC rate and methodology approved by City Council.

[10] Approximated to be 10 times the projected 590 weekday p.m. peak hour trips generated by the 2030 forecast growth of 268 households and 294 jobs.

[11] Equal to approximately $12,400 per single family home.

Additional Funding and Financing Sources

Transportation projects are often paid for using a combination of funding and financing. Funding describes methods that generate revenue for transportation projects. Financing refers to how projects are paid for over time. The City of Carlton can investigate a number of additional funding and financing sources to construct projects on their *Preferred Plan* that are not currently on the *Fiscally Constrained Plan.*

For each of the practical alternatives listed below, there is a brief description and a short discussion. No effort has been made to screen alternatives according to their political or legal feasibility. The intent of the discussion is to provide an overview of a number of alternative revenue sources.

Federal Resources

SAFETEA-LU

The current federal transportation funding bill is the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (commonly known by its acronym, SAFETEA-LU), which authorizes funding for the nation's surface transportation programs. It was signed into law in August 2005 and replaced the expired Transportation Equity Act for the 21st Century (TEA-21). The law establishes funding levels and policies for the federal government's highway, highway safety, transit, motor carrier, and some rail programs administered by the U.S. Department of Transportation (DOT). Funds to local agencies within the State of Oregon are primarily allocated by the Oregon Department of Transportation (ODOT) unless dedicated to a local agency through a specific project earmark. SAFETEA-LU expires September 30, 2009 and there is currently no federal transportation funding bill to replace it; however a new bill is currently being created.

Potential: The potential for Carlton to take advantage of the next bill will likely be through lobbying to get their projects on the next ODOT STIP and applying for funds dedicated to specific types of projects, such as pedestrian and bicycle projects or downtown revitalization, for local agencies. No specifics are available at this time to what the future bill may include or how much funding will be available for local agencies.

Community Development Block Grants (CDBG)

Some of the past ODOT administered grants to the City of Carlton have been CDBG Program funds, which are offered through the Federal Department of Housing and Urban Development. To receive CDBG funds, cities must compete for grants based upon a formula that includes factors such as rural/urban status, demographics, local funding match, and potential benefits to low-to-moderate income residents, including new job creation. CDBG funds can also be used for emerging public work needs.

Potential: In small rural communities this program has limited application but may be a source of street funds for roads serving new developments supporting job creation or multifamily housing. A CDBG was used to help fund the Main Street improvements. CDBG funding requests should be coordinated through Yamhill County.

Federal Economic Development Administration (EDA)

The Federal Economic Development Administration provides annual grant funding on a competitive basis for public works improvements that directly generate or retain jobs in local communities. These funds can be used for local utilities and transportation facilities that serve new development sites.

Potential: EDA funds are difficult to obtain but could be considered for targeted improvements for local industry expansion. Funding requests for EDA grants should be coordinated with Yamhill County and the OECDD.

State Funding Options

State Motor Vehicle Fund

The State of Oregon currently collects the following fuel and vehicles fees for the State Motor Vehicle Fund:

- State Gas Tax $0.24 per gallon
- Vehicle Registration Fee $15.00 per year

In addition, a weight-mile tax is assessed on freight carriers to reflect their use of state highways. The revenue from the fund is used by ODOT and distributed to cities and counties throughout the state with each city's distribution based on a city's share of statewide population, and the county distribution based on a county's share of statewide vehicle registration.

Existing Application: ODOT Region 2, Yamhill County, and the City of Carlton each receive funds from the state Motor Vehicle Fund. ODOT uses their allocation from the State Motor Vehicle Fund for maintenance and capital purposes. Yamhill County and the City of Carlton typically use their funding allocation for street maintenance; however it could be used for other types of projects such as pedestrian and bicycle projects.

The state distributes approximately 16 percent of the State Motor Vehicle Fund to cities and 24 percent to counties based on a per capita rate (cities) and vehicle registration (counties). The remaining amount in the State Motor Vehicle Fund is used to maintain and enhance the state highway system. The state operates a grant program available to cities for bicycle-related transportation system improvements and one percent of the fuel tax returned to cities and counties is designated for bike paths and lanes.

Potential: With an increase in population, number of registered vehicles, and fuel sales, the total revenue from the State Motor Vehicle Fund will rise but if the fees (tax per gallon) stay at current levels, there will be a reduction in buying power due to inflation. The gas tax will however continue to be a source of funds for the City of Carlton directly as well as through ODOT for highway and pedestrian and bicycle projects.

Special Public Works Funds (SPWF) and Immediate Opportunity Funds (IOF) — Lottery Program

Description: The State of Oregon through the Economic and Community Development Department provides grants and loans to local governments to construct, improve, and repair public infrastructure in order to support local economic development and create new jobs.

Existing Application: SPWF and IOF funds have been used in a number of cities for the construction of water, sewer, and limited street improvements.

Potential: These funds are limited to situations where it can be documented how a project will contribute to economic development and family-wage job creation. An example of the application of these funds in Carlton may be for street improvements on Highway 47, such as center-turn lanes, bicycle lanes, and sidewalks to better facilitate access to businesses located north and south of Main Street and facilitate walking trips for customers accessing downtown retail businesses. Funding applications should be coordinated with Yamhill County, OECDD, and ODOT.

Special Small City Allotment (SCA)

Description: SCA funding is available to incorporated cities with populations less than 5,000. This funding comes from state gas tax funds and provides grants up to $25,000 to selected cities. Cities are asked by ODOT annually to apply for funding for projects they select on their local street system. Cities can apply only if previous SCA Grants are complete and paid for. ODOT regions evaluate project proposals from each city and rank each proposal.

Application: Region 2 is allocated several grants per year for small cities. Carlton has received several SCA Grants through ODOT in the past for pavement maintenance and sidewalk projects.

State Bicycle-Pedestrian Grants

Description: ODOT's Bicycle and Pedestrian Program administers two grant programs to assist in the development of walking and bicycling improvements: local grants and Small-Scale Urban Highway Pedestrian Improvement (SUPI) programs. For both these grants, cities that have adopted plans with identified projects will be in the best position. Cities and counties can apply for local grants for bicycle and pedestrian projects within the right-of-way of local streets. Local grants up to $100,000 are shared 80% State and 20% local. Projects that consider the needs of children, elderly, disabled, and transit users are given special consideration.

There must be support for the project from local elected officials. Applications for the Local Grant program are mailed out to all Oregon jurisdictions every other year. In the SUPI process, cities and counties help ODOT identify sections of urban highways where improvements are needed. Examples of eligible projects include:

- completing short missing sections of sidewalks;
- ADA upgrades;
- crossing improvements (e.g., curb extensions, refuges, crosswalks); and,
- intersection improvements (e.g., islands and realignment).

SUPI projects are located on highways that have no modernization projects scheduled for the foreseeable future. Projects that have a local funding match are typically viewed the most favorably because this indicates strong local support. Projects on highways that cost more than $100,000, require right-of-way, or have environmental impacts need to be submitted to ODOT for inclusion in the STIP. Cities and counties can apply annually for bike path or sidewalk grants of projects they have selected. Grants for projects on local street systems have a match of 20 percent and projects next to state highways have a lower match requirement. Bicycle-pedestrian grants are generally below $125,000 per project. Project evaluation and selection is made annually statewide by the Statewide Bicycle/Pedestrian Committee.

Application: Communities throughout Yamhill County have successfully received these grants for bicycle and sidewalk improvements.

ODOT Enhancement Program

Description: The Transportation Enhancement program provides federal highway funds for projects that strengthen the cultural, aesthetic, or environmental value of the transportation system. The funds are available for twelve "transportation enhancement activities," which are categorized as:

- Pedestrian and Bicycle projects;
- Historic Preservation related to surface transportation;
- Landscaping and Scenic Beautification; and
- Environmental Mitigation.

Existing Application: The Enhancement Program funds special or additional activities not normally required on a highway or transportation project. So far, Oregon has funded more than 150 projects for a total of $63 million.

Potential: The City could seek Enhancement Program funds for bicycle and sidewalk projects including the multi-use path along the railroad right-of-way.

State Parks Funds

Description: Recreational Trails Grants are national grants administered by the Oregon Parks and Recreation Department (OPRD) for recreational trail-related projects, such as hiking, running, bicycling, off-road motorcycling and all-terrain vehicle riding.

Existing Application: OPRD gives more than $4 million annual to Oregon communities for outdoor recreation project, and has awarded more than $40 million in grants across the state since 1999. Grants can be awarded to non-profits, cities, counties, and state and federal agencies.

Potential: Funding is primarily intended for recreational trail projects, so the City could seek funding for the multi-use trail along the railroad right-of-way.

Local Funding Options

The following programs are used by cities in the funding of transportation improvements:

General Obligation Bonds (G.O. Bonds)

Description: Bonds are often sold by a municipal government to fund transportation (or other types) of improvements, and are repaid with property tax revenue generated by that local government. Under Measure 50, voters must approve G.O. Bond sales with at least a 50 percent voter turnout.

Existing Application: Cities all over the state use this method to finance the construction of transportation improvements. For smaller jurisdictions, the cost of issuing bonds *vs.* the amount that they can reasonably issue creates a problem. Underwriting costs can become a high percentage of the total cost for smaller issues. According to a representative of the League of Oregon Cities, the state is considering developing a "Bond Pool" for smaller jurisdictions. By pooling together several small bond issues, they will be able to achieve an economy of scale and lower costs.

Potential: Within the limitations outlined above, G.O. bonding can be a viable alternative for funding transportation improvements when focused on specific projects.

Serial Levy/Property Taxes within the Limits of Ballot Measure 50

Description: Local property tax revenue (city or county) could be used to fund transportation improvements through a serial bond levy.

Existing Application: Revenue from property taxes ends up in the local government general fund where it is used for a variety of uses. Precedents for the use of property taxes as a source of funding for transportation capital improvements can be found throughout the state. However, with the limitations resulting from Measure 50, use of property taxes for transportation capital improvements will continue to compete with other general government services under the three percent assessed value increase allowed by Measure 50 and the local tax limits of $15 per $1,000 of assessed value established under Measure 5. Under Measure 50, however, there is no limit on assessed value generated by new construction.

Potential: Because the potential for increased funding from property tax revenue is limited by Ballot Measures 5 and 50 and by competition from other users who draw funds from the general fund, it is not a practical source for financing major local street improvements but could finance a package of minor improvement projects.

Local Street Utility/User Fee

Description: This fee is based on the fact that streets are utilities used by citizens and businesses just like a public water or sewer system. Fees are typically assessed by usage (e.g., average number of vehicle trips per development type).

Existing Application: This fee is used in many Oregon cities through a monthly fee charged to local dwelling units and businesses. The formulas range from a flat rate per dwelling unit and per

business ($10/month and $25/month, for example) to rates calculated for each property individually based on the Institute for Transportation Engineers Trip Generation Handbook. Statewide the average revenue generated by local jurisdictions with a Street Utility Free is approximately $26 per year per resident (not per dwelling unit). Typically the revenue generated by these fees are used for operations and maintenance of the street system but the ability to use these fees for capital projects, including pedestrian and bicycle projects should be explored.

Potential: In Carlton, a $10.00 monthly fee charged to the estimated 673 households would generate approximately $81,000 per year in revenue from residential uses alone. As households grow to an estimated 941 in 2030, revenues would grow to $113,000 annually. The ability to use these fees for capital projects, including pedestrian and bicycle projects should be explored.

Local Improvement District (LID)

Description: Under a local improvement district (LID), a street or other transportation improvement is built and the adjacent properties that benefit are assessed a fee to pay for the improvement.

Existing Application: LID programs have wide application for funding new or reconstructed streets, sidewalks, water/sewer or other public works projects. The LID method is used primarily for local or collector roads, though arterials have been built using LID funds in certain jurisdictions.

Potential: LIDs continue to offer a good mechanism for funding projects such as new sidewalks and street surface upgrades. An example of a good application for an LID may be for sidewalk projects on collector streets. In the developed areas of Carlton where there are no sidewalks in front of existing developed properties, the City may be able to fund the cost of sidewalks on collector streets to provide a connected pedestrian system for current and future residents.

Urban Renewal District

Description: An Urban Renewal District is an area that is designated by a community as a "blighted area" to assist in revitalization. Funding for the revitalization is provided by urban renewal taxes, which are generated by the increase in total assessed values in the district from the time it was first established.

Existing Application: Urban Renewal Districts have been formed in over 50 cities in Oregon, generally focused on revitalizing downtowns.

Potential: Urban Renewal dollars can be used to fund infrastructure projects such as roadway, sidewalk, or transit improvements. Since funding relies on taxes from future increases in property value, the City may seek to create a District where such improvements will likely result in such an increase.

Developer Dedications of Right-of-Way and Local Street Improvements

Description: New local streets required to serve new development areas are provided at the developer's expense to the City in accordance with the tentative and final plan approvals granted by the City Council.

Existing Application: Current City ordinance requires local streets and utilities to be provided in accordance with the adopted Land Use Plan, and the zoning ordinance and subdivision ordinance. This includes dedication of street/utility right-of-way and construction of streets, pedestrian/bicycle facilities, and utilities to City design standards.

Potential: Private developer street dedications are an excellent means of funding new local street/utility extensions, and are most effective if guided by a local roadway network plan. This funding mechanism can apply to all new local street extensions in Carlton within the 20-year planning period.

Transportation Financing Summary

- The total cost of the Preferred Plan is approximately $8.6 million; however, the Financially Constrained Alternative was limited to $2.8 million based on the projected funds of approximately $1,327,500 over the next twenty years between City, County, ODOT sources and an estimated $1,475,000 from a potential Transportation System Development Charge.
- The projected $1,475,000 of revenues from a TSDC assumes a rate of $250 per daily trip[12] with future growth trips equal to approximately 5,900.
- SDCs can only be used to address growth-related transportation needs. SDCs cannot be used to fund any existing transportation deficiencies therefore the policy framework and methodology will need to identify the growth component of the pedestrian and bicycle improvements and the Financially Constrained Alternative project list will need to be reevaluated.
- Between the Preferred Plan and Financially Constrained Alternative there is an approximately $5.8 million funding gap. The City of Carlton can investigate a number of additional funding and financing sources to construct projects on their Preferred Plan that are not currently on the Fiscally Constrained Plan.
- In addition to the Community Development Block Grants (CDBG) and the Special Small City Allotments (SCA) which the City of Carlton has received in the past, and the TSDC under consideration, the additional funding sources that appear to have the most potential include the following:
    - Special Public Works Funds (SPWF) and Immediate Opportunity Funds (IOF) — Lottery Program
    - State Bicycle-Pedestrian Grants
    - Local Street Utility/User Fee
    - Local Improvement District (LID)
    - Urban Renewal District

[12] A review of TSDC rates for small cities indicates a range of $100 to $500 per daily trip. Source: Don Ganer.

IMPLEMENTING ORDINANCES

Transportation implementing ordinances are needed to enable the construction of planned TSP facilities and protect planned transportation facilities. TSP implementing ordinances are also needed to ensure consistency with other adopted local policy and regulatory documents, and to comply with the Oregon Transportation Planning Rule (TPR). The TPR requires cities to adopt policies and land use regulations for implementing the TSP as provided in OAR 660-12-045.

A review of Carlton's Comprehensive Plan and related ordinances including, the Carlton Development Code and the Carlton Public Works Design Standards (2008), has been completed and changes and additions made. The existing ordinances, and indicated changes and additions, are shown in Appendix P.

The implementing ordinances were reviewed and adopted during review and adoption of the TSP.

Section 7
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Please see *Carlton Transportation System Plan - Appendices* file

Appendix A
Review of Existing Plans, Policies and Standards