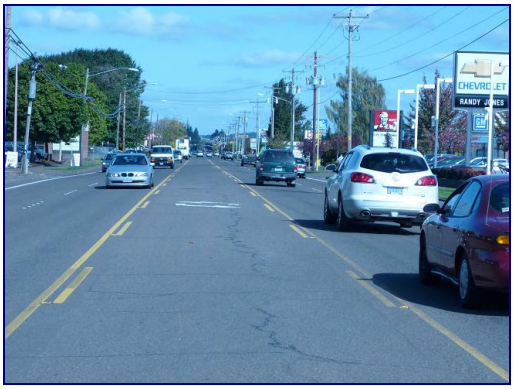
Corvallis Area Metropolitan Planning Organization

9th Street Improvement Plan



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Corvallis Area Metropolitan Planning Organization

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Under
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Accepted by the
City of Corvallis City Council on March 15, 2010

Corvallis Area Metropolitan Planning Organization

Policy Board

Bill Currier	City of Adair Village
Hal Brauner	City of Corvallis
Linda Modrell	County of Benton
Vivian Payne	Oregon Department of Transportation
Ken Schaudt	City of Philomath

Technical Advisory Committee

John deTar	Oregon Department of Transportation
Drew Foster	City of Adair Village
Ted Frasier	City of Albany, Transit System
Roger Irvin	County of Benton
Jim Mitchell	City of Corvallis
Randy Kugler	City of Philomath

Project Advisory Committee

Ali Bonakdar	CAMPO
Hal Brauner	City Council
David Helton	ODOT, TGM Program
Randy Jones	Randy Jones Chevrolet
Kelley Kaiser	Samaritan Health Plan
Frank Mauldin (Ex-Officio)	Civic Beautification and Urban Forestry
Jim Mitchell	City of Corvallis Transportation Division
Steve Rogers	City of Corvallis Public Works Department
Fred Towne	City of Corvallis Community Development Dept
Stewart Wershow	Neighborhood Representative
Scott Wilson	Oregon Cascades West Council of Governments

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The contents of this document do not necessarily reflect views or policies of the State of Oregon.

Valuable contributions from the following individuals and organizations were crucial to the completion of this project:

9th Street Improvement Plan, Project Advisory Committee (PAC)
City of Corvallis Public Works, Engineering Division
City of Corvallis Community Development Department
Oregon Cascades West Council of Governments (OCWCOG)
City of Corvallis Public Works, GIS Division

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Community Development
Planning Division
501 SW Madison Avenue
P.O. Box 1083
Corvallis, OR 97339-1083
(541) 766-6908
FAX: (541) 754-1792
Planning@ci.corvallis.or.us

March 16, 2010

Ali Bonakdar, Director
Corvallis Area Metropolitan Planning Organization
301 SW 4th Street, Suite 140
Corvallis, OR 97333

RE: City Council Review of the CAMPO-proposed 9th Street Improvement Plan

Dear Ali:

At its March 15, 2010, meeting, the City Council accepted public comments about and reviewed the CAMPO-proposed 9th Street Improvement Plan. The Council unanimously decided to do the following:

1) **CONCUR that the Plan is consistent with the Land Development Code and that no Land Development Code Text Amendments are needed to implement the recommendations of the Plan;**

2) **REMOVE the introductory parenthetical note for subsection F(b) under Traffic Flow Improvements on page 49 of the CAMPO-proposed 9th Street Improvement Plan (Attachment C-57 of Exhibit III); and**

3) **ACCEPT the March 5, 2010, staff report to the City Council and CLARIFY that, to the extent that the recommended improvements in the CAMPO-proposed 9th Street Improvement Plan provide guidance, then they can be used to inform decision-making for future projects. However, the CAMPO-proposed 9th Street Improvement Plan will not establish standards nor criteria for land use permits or any other building or construction permits issued by the City.**

This letter serves to document the City Council's decision on this matter. Please provide the City with some hard copies and an electronic copy of the full final version of the Plan so that Community Development Department staff and Public Works Department staff can consult the document in the future. If your budget allows, it would be most helpful to have at least 20 hard copies of the final document.

Please let us know if you have any questions and thank you for your leadership on this project.

Sincerely,

Kelly Potter

Kelly Potter, Senior Planner
City of Corvallis

cc: Ken Gibb, Community Development Director
Steve Rogers, Public Works Director
Gene Braun, City Engineer
Kevin Young, Planning Division Manager
Jeff McConnell, Development Review Engineering Supervisor
Greg Gescher, Engineering Supervisor
Dan Carlson, Development Services Manager

Executive Summary

The City of Corvallis 1996 Transportation Plan calls for the development of an access management plan and safety improvements for 9th Street. Since the development of these recommendations the need for safety and operation improvements along 9th Street has increased. In 2007 the Corvallis Area Metropolitan Planning Organization (CAMPO) successfully applied for a Transportation and Growth Management (TGM) grant to develop a 9th Street Improvement Plan in collaboration with the City of Corvallis and the Cascades West Council of Governments.

The purpose of the 9th Street Improvement Plan is to improve operation and safety for all modes of transportation and to improve access management between Polk Avenue and Elks Drive. The 9th Street Improvement Plan is a product of a multi-prong approach that included a technical track, a Project Advisory Committee (PAC) and extensive public outreach.

An inventory of the existing transportation and land use features of the study area was prepared. The inventory examined the condition of the street, sidewalks, bike lanes, landscaping, intersections, private and public access points, land use, trip generators and the number and types of crashes along the study area. The inventory recorded issues and deficiencies relative to the safe and efficient movement of vehicles, bikes, transit and pedestrians, as well as those relative to the aesthetics of the area. This technical work was coupled with a list of issues and deficiencies identified by the public through the holding of a public meeting and other public outreach conduits.

The technical team developed alternative solutions to address identified issues and deficiencies. Alternative solutions were analyzed and were presented to the public for feedback. Chief among these was the construction of a dozen of planted medians at locations deemed to have the least impacts on businesses. At the end, this alternative was removed from the list of recommendations due to a widespread opposition by the business owners and the general public who believed the planted medians would severely restrict access to the businesses.

Meanwhile, a consultant was hired to analyze the capacity of the intersections, project future capacity needs and to recommend improvements to meet current and future needs. The consultant recommended intersection reconfiguration and traffic signal coordination in consideration of current deficiencies and future planned developments. The work of the consultant was incorporated into the Plan.

In review of the public comments and the technical analyses, the Project Advisory Committee developed recommendations for the improvement of walking, biking, transit, landscape, aesthetics, access management, traffic flow and the coordination of land use and transportation in the study area. The costs of implanting these recommendations were estimated, possible funding sources were identified and the processes for placing the recommendations in appropriate funding tracks were outlined.

The City of Corvallis Planning Commission, following a public testimony, recommended the acceptance of the 9th Street Improvement Plan to the City Council. The City of Corvallis City Council accepted the Plan on March 15, 2010, following the hearing of public testimonies.

Chapter I
Introduction

Ninth Street is one of the most commercial arterials in the Corvallis Metropolitan Area. The street also functions as a major carrier of southerly-northerly traffic in the City of Corvallis. This functionality combined with a large number of access driveways that serve a variety of land uses presents challenges to motorists, bicyclists, and pedestrians.

Ninth Street exhibits many of the problems typically associated with commercial strip developments. High traffic volumes and closely-spaced access points are general attributes of strip developments. This situation, in turn will lead to reduced operational efficiency, increased traffic congestion and reduced safety for all users of the arterial.

Realizing this situation, in 2007 transportation officials deemed that a plan should be developed for the improvement of 9th Street. The Corvallis Area Metropolitan Planning Organization (CAMPO) developed an application for the Transportation and Growth Management (TGM) fund for the improvement of 9th Street. This initial application focused on the development of an access management plan for 9th Street. The Oregon Department of Transportation (ODOT) however suggested turning the focus of the project from an access management plan to the development of a comprehensive corridor improvement plan. It took ODOT and CAMPO a year to arrive at a mutually acceptable scope of work for this project.

Several parameters framed the development of the scope of work for this project. First, the TGM Program requires that funded projects include recommendations that would be adopted by the appropriate jurisdiction for implementation. On the other hand, the City of Corvallis City Council, per a policy, does not adopt a recommendation that lacks a reliable funding source. Given the budget constraints at all levels of government, it was evident that the construction of any sizable transportation facility would encounter financial difficulties.

Therefore, the strategies and measures recommended by this effort will be incorporated into the City of Corvallis Land Use Development Code for implementation as part of the City's permitting process. Incorporating any new recommendation into the City of Corvallis Development Code requires the approval of the City Council.

The 9th Street Improvement Plan has been developed by the Corvallis Area Metropolitan Planning Organization (CAMPO) in collaboration with the City of Corvallis and the Oregon Cascades West Council of Governments (OCWCOG).

Corvallis Area Metropolitan Planning Organization

The Corvallis Area Metropolitan Planning Organization (CAMPO) is the designated Metropolitan Planning Organization (MPO) for the Corvallis Urbanized Area. The Corvallis Urbanized Area is composed of city of Corvallis, city of Philomath, city of Adair Village and the densely developed urban areas adjacent to these cities (Map I-1).

MPOs are designated by a decree of the governors of states, pursuant to the US Code, Title 23 and 49. In December 2002 the Oregon Governor designated CAMPO as the MPO for the Corvallis Area. MPOs are responsible for transportation planning and programming within Urbanized Areas. The Policy Board of CAMPO is made up of representatives of the cities of Corvallis, Philomath and Adair Village, Benton County Board of Commission and the Oregon Department of Transportation (ODOT). CAMPO's administrative services are rendered by the OCWCOG.

Purpose of the Study

The purpose of the 9th Street Improvement Plan is to develop strategies for improving the operation of 9th Street for vehicles, pedestrians, bicyclists, and transit services. The objectives of the Project are:

1. To improve the operation of 9th Street for vehicles, pedestrians, bicyclists, and transit services;
2. To develop a 9th Street Improvement Plan that guides future developments, and;
3. To incorporate the recommendations of 9th Street Improvement Plan into the City of Corvallis Development Code for implementation.

Study Area

This study encompasses approximately 2.2 miles of 9th Street in the City of Corvallis. This is the most commercially developed portion of the street, and it extends from the southern limit that is the Polk Avenue intersection to the northern limit which is the Elks Drive intersection (Map I-2).

Chapter II
Inventory of Existing Conditions

The purpose of this chapter is to provide a snapshot of all transportation and land use features of 9th Street.

The Study Area is primarily a commercial strip with a few residential units located at both ends of the study area. The majority of this roadway is composed of four lanes of traffic (two northbound and two southbound), a center turning lane, two bikelanes (northbound and southbound) and sidewalks on both sides. The northern segment of the street between Hemlock and Conifer Blvd. has four traffic lanes and no center lane. Further north, between Conifer Blvd and Elks Drive, the number of traffic lanes is reduced to one in each direction with no center lane. The facility includes curb and gutter (Urban Section) throughout the study area with planter strips and curb cuts on most parts.

Ninth Street south of the study area boundary is a narrow four lane residential street with substantial greenery that has little or no resemblance to the northern segment.

Land Use and Zoning

The prevalent zoning designation in the study area is commercial. The majority of the commercial activities are in the Mixed Use Community Shopping (MUCS) zone. MUCS are strips of:

> "*Commercial developments between neighborhood centers that are intended to transition to a more pedestrian and human scale environment. The MUCS zone is intended to provide for retail businesses and commercial and personal service activities of limited sizes…, accommodating both pedestrian oriented uses and a limited number of land uses that are more dependent on automobile circulation.*[1]"

The southwest quadrant of Beca Avenue intersection is zoned as Minor Neighborhood Center (NC-Minor) and the southwest quadrant of Circle Blvd intersection is zoned as Major Neighborhood Center (NC-Major). Neighborhood Centers serve the community-wide shopping and office needs of neighborhoods and are composed of several acres of intense commercial and residential developments.

A few parcels south of Fremont Avenue and between Linden Avenue and Conifer Blvd are zoned as Professional and Administrative Office (P-AO). The P-AO Zone "is intended to establish suitable urban areas for diversified office uses in concentrated centers.[2]"

There are approximately 40 residential units in the study area. These are mainly located at both ends of the study area and all on the west side of the Street. There are also five vacant lots that have been zoned as residential.

[1] City of Corvallis 2006 Land Development Code, Section 3.19.10
[2] Ibid, Section 3.11.10

Map II-1 shows the zoning designations of the study area.

Vacant Land
For the most part the study area is fully developed. There are, however, a dozen vacant parcels awaiting future development. Five of these parcels totaling 1.45 acres are zoned for residential use. The remaining seven parcels are zoned for Mixed Use Community Shopping (MUCS). The total size of these seven parcels is 11.87 acres. While most of these parcels are small lots, there is a 7.05 acre lot and a 1.77 acre lot that are vacant.

Major Activity Centers
For the purpose of this Study, major activity centers are clusters of business activities that generate high volumes of trips. Some of the activity centers include a high number of access points. Within the study area four major activity centers were identified. These are shown in Map II-2 and described below:

- **Benton Center/Avery Square Area:** Located at the southern end of the study area, this Activity Center is formed by the Benton Center of the Linn-Benton Community College and the concentration of offices at the Avery Square. A considerable volume of educational and business trips are generated by the college, the Cannery Mall, and the two restaurants. The activity center extends approximately 900 feet along 9th Street from the east leg of Polk Street to the Reiman Street intersection. Two driveways at either end of the center provide access to an off-the-street parking lot.

- **Corvallis Market Center:** This center begins approximately 200 feet south of the Hayes Avenue intersection and extends 1,700 feet northward. The newly constructed Corvallis Market Center includes several major stores and fast food restaurants that generate a sizable number of trips. Immediately adjacent to the Market Center is the 76 Service Station, three hotels, a movie theatre and a restaurant. This activity center has a fairly limited number of access points. Most of the businesses in this activity center can be reached from the accesses on Hayes Avenue or Garfield Avenue. By contrast, there are eleven private access points on the east side of the street that serve a variety of small businesses.

- **Circle Blvd Intersections Activity Center:** This major activity center includes both the Circle Boulevard/9th Street intersection and the Circle Blvd /OR 99W intersection. Two major retail outlets that generate a significant number of trips are located on the east and west sides of the 9th Street (Bi-Mart and Rite-Aid). Additionally, the business activities along Circle Blvd and adjacent to this intersection significantly add to the volume of traffic at this intersection. This activity center includes seven private access points onto 9th Street. The Spruce Avenue intersection is included in the activity center.

- **Fast Food Center:** Beginning approximately 700 feet north of the Circle Blvd intersection, there is a cluster of six fast food restaurants, five of which have drive through windows. The eastern boundary of this activity center includes the intersection of Walnut Blvd and OR 99W and the north boundary includes a service station and a

convenient store south of Conifer Blvd. This major activity center includes nineteen private access points onto 9th Street and five public street intersections. Among these intersections is the intersection of Walnut Blvd which is a significant minor arterial in the area's traffic circulation.

Demographics

Methodology

Population and employment data for the 9th Street study area was obtained from Transportation Analysis Zones[3] (TAZs). These statistics were used for the development of the Corvallis Area Travel Demand Model, a major component of the *Corvallis Area Metropolitan Transportation Plan: Destination 2030* (CAMTP, 2006). The population and employment data for the TAZs have been derived from the US 2000 Census by the aggregation of the Census Blocks and Block Groups. The allocation of these statistics to the TAZs was overseen by the participation of local land use and transportation professionals. The projection data used statistics from the PSU Certified Population Estimates and the Oregon Employment Office.

Fifteen TAZs cover the 9th Street study area. These TAZs are shown in Map I1-5. Although the boundaries of the fifteen TAZs largely extend beyond the boundaries of the study area, it could be reasonably assumed that the population and employment within these TAZ rely heavily on 9th Street for their socio-economic activities.

Population

The US 2000 Census data shows that 5,632 people live within the TAZs that cover the study area. It should be noted that only 17 residential units have direct access to 9th Street and most of this population lives off of 9th Street. CAMPO's demographic projections showed that the TAZs' population is expected to increase by 345 persons to a total population of 5,977 by 2010. Between 2010 and 2030 the population is expected to remain stable with no change. This very limited population growth is due to the fact that the buildable residential land in the TAZs is nearing full build-out status. Table II-1 shows current and projected population for the fifteen TAZs.

Employment

According to the US 2000 Census 3,796 people were employed in the 9th Street TAZs. Table II-2 shows current and projected employment for each TAZ. The service sector had the highest share of this employment. The retail sector was in second place with 18.4 percent (698) of the total employees and manufacturing jobs comprised 15.8 percent of the total.

Projections for future employment levels show that overall job growth should be about 38 percent in the TAZs by 2030, for a total employment level of 5,228 jobs. The greatest period of job growth is expected to occur by 2010 with a 22 percent increase. The percentage of jobs in each of the employment sectors is expected to remain relatively stable during the planning horizon.

There are significant employment centers near 9th Street and beyond the TAZs that cover the study area. A portion of the workers in those outlying centers are likely to travel on 9th Street during their commutes. Located north of the study area is the medical complex that includes

[3] A brick of model building, a Transportation Analysis Zone (TAZ) is the smallest geographic unit representing socio-economic characteristics of an area.

Good Samaritan Regional Medical Center and the Corvallis Clinic with a combined employment of approximately 2,700 people. The Hewlett-Packard campus east of the corridor is the work site for approximately 2,500.

Table II-1
Current and Projected Population by TAZs

TAZ	2000	2010	2020	2030
132	315	415	415	415
133	353	353	353	353
134	4	4	4	4
135	408	408	408	408
137	1,027	1,027	1,027	1,027
165	516	516	516	516
180	466	466	466	466
183	514	514	514	514
184	164	164	164	164
185	110	146	146	146
186	27	27	27	27
457	860	969	969	969
458	860	960	960	960
459	4	4	4	4
460	4	4	4	4
Total	5,632	5,977	5,977	5,977

Based on 2005 Population and Employment Projections for the Corvallis Area Travel Demand Model

Table II-2 Current and Projected Employment by TAZs				
TAZ	**2000**	**2010**	**2020**	**2030**
132	64	153	164	172
133	39	47	50	53
134	371	447	480	504
135	104	125	135	141
137	116	140	150	158
165	410	494	531	557
180	218	263	282	296
183	23	28	30	31
184	42	51	54	57
185	694	837	898	942
186	470	567	608	638
457	186	213	229	240
458	429	517	555	583
459	383	462	496	520
460	182	219	236	247
Total	3,731	4,564	4,898	5,139

Based on 2005 Population and Employment Projections for the Corvallis Area Travel Demand Model

Access Inventory

A prominent feature of the study area is the number of access points that interfere with the flow of traffic. There are 121 private access points on either side of the 2.2 miles of the study area. Recommended guidelines for spacing of access points along a minor arterial by both the City of Corvallis and ODOT are quite below this rate. Appendix II-A shows the City of Corvallis and ODOT's standards for spacing driveways along different classes of roadways.

Tables II-3 A and II-3 B show an inventory of all private access points along the study area. The tables show the number of driveways for each segment, the total land devoted to driveways and the average distance between driveways as measured by GIS technology. The tables also show the number of driveways per 660 ft. which is the recommended spacing for a Minor Arterial.

Some 4,700 feet (41%) of 9th Street curbsides are devoted to driveways. There is a higher concentration of driveways on the east side of the street. The segments with the highest concentration of driveways are Beca Avenue to Grant Avenue and to Hayes Avenue on the west side and Walnut Blvd to Conifer Blvd and Starker Avenue to Circle Blvd on the east side.

Table II-3 A
9th Street Access Inventory (East Side), 2008

Segment	Length of Segment (Ft.)	Total Width of Drive-ways per Segment (Ft.)	Avg. Distance Between Driveways (Ft.)	Avg. Driveway Width (Ft.)	Drive-ways as Percent of Total Segment Length	Number of Private Drive-ways	Possible Access Points Per City Develop-ment Standards[1]
South Project Limit - Polk	164	0	NA	NA	NA	0	0.00
Polk - Reiman	892	103	125	52	12%	2	3.72
Reiman - Sunnybrook	471	76	132	38	16%	2	1.49
Sunnybrook - Buchanan	326	46	NA	47	14%	1	0.72
Buchanan - Cornell	970	295	96	49	30%	6	4.13
Cornell - Starker	359	0	NA	NA	NA	0	0.90
Starker - Circle	3,920	1,219	81	42	31%	29	19.74
Circle - Walnut	2,017	539	90	45	27%	12	9.67
Walnut - Conifer	1,128	374	56	42	33%	9	4.97
Conifer – Elks	1,366	0	NA	NA	NA	0	6.23
Total	11,613	2,652				61	51.58

Table II-3 B
9th Street Access Inventory (West Side), 2008

Segment	Length of Segment (Ft.)	Total Width of Drive-ways per Segment (Ft.)	Avg. Distance Between Driveways (Ft.)	Avg. Drive-way Width (Ft.)	Drive-ways as Percent of Total Segment Length	Number of Private Drive-ways	Possible Access Points Per City Develop-ment Standards[1]
Polk (Project Limit) - Fremont	503	23	NA	23	5%	1	1.66
Fremont - Buchanan	1,330	296	82	30	22%	10	6.04
Buchanan - Beca	1,102	312	55	28	28%	11	4.83
Beca - Grant	550	184	43	31	33%	6	1.91
Grant - Hayes	755	208	59	35	28%	6	2.99
Hayes - Garfield	596	35	NA	35	6%	1	2.15
Garfield - Spruce	1,773	260	163	52	15%	5	8.38
Spruce - Circle	487	70	136	35	14%	2	1.58
Circle - Sycamore	509	122	102	61	24%	2	1.69
Sycamore - Sequoia	407	80	102	40	20%	2	1.15
Sequoia - Linden	349	92	51	46	26%	2	0.85
Linden - Oak	436	82	14	41	19%	2	1.31
Oak - Walnut	309	0	NA	NA	NA	0	0.63
Walnut - Hemlock	444	50	NA	50	11%	1	1.35
Hemlock - Ponderosa	304	21	NA	21	7%	1	0.61
Ponderosa - Conifer	386	0	NA	NA	NA	0	1.04
Conifer - Maxine	337	61	93	31	18%	2	0.78
Maxine - Elks	1,036	187	96	31	18%	6	4.48
Total	**11,613**	**2,083**				**60**	**43.44**
Grand Total (Both Sides)	**23,226**	**4,735**				**121**	**95.02**

1. City of Corvallis Land Development Code, Section 4.1.40, sets access standards of minimum150 feet between access points. This column shows the maximum number of access points allowable based on the current Code. The distance between intersections and intermediate accesses was calculated from the centerline of intersections. The calculations assume that each access (driveway) is 39 feet wide, which is the average driveway width in the 9th Street study area.

The inventory of driveways on 9th Street points to the following:

1. There is a relatively high concentration of access points along the study area;
2. The access points in many instances are situated too close to each other;
3. There are access points that are excessively wide;
4. There are business establishments with more than one access driveway.

Transportation System

Streets

Ninth Street is an urban minor arterial that connects downtown Corvallis to northwest Corvallis and to some of the highest trip destinations in the area. This relatively busy street serves motorists, transit, bicyclists, and pedestrians as both a thoroughfare and a destination. There are 19 avenues intersecting 9th Street on the west side and ten on the east side. The only aligned four-legged intersections are Buchanan, Circle, Walnut, and Elks. A majority of these avenues form a tee intersection with 9th Street. Several avenues intersect 9th Street at a slight angle and a few of them form misaligned intersections. All intersecting avenues are paved.

Land use on side avenues is generally residential. In few instances there is some commercial use on intersecting avenues, particularly in the area closer to the intersection with 9th Street.

Sidewalks

Sidewalks are generally present on both sides of 9th Street, with the exception of the block between Conifer Blvd and Elks Drive, where only the west side of the Street has sidewalks. Most of the sidewalks are five feet wide, although, wider or narrower sidewalks are common. The sidewalks are either adjacent to the curb or to a planter strip. The sidewalks and planter strips switch sides at different segments of the street.

A notable feature of the sidewalks is their condition. While most property owners maintain their sidewalks in good condition, some have allowed deterioration of the pavement condition and the growth of weeds. This is mostly apparent in front of the vacant parcels. In one or two short segments, the overgrown plants in the planter strip cover a portion of the sidewalks, a situation that poses difficulties to the passage of people on wheelchairs.

Marked Crossings

Marked crosswalks are located at seven intersections in the study area. At the Buchanan, Grant, Garfield, Circle, and Walnut intersections crosswalks are present on both 9th Street and the intersecting roads. The Polk intersection has crosswalks only on 9th Street. There were no pedestrian islands at any of the intersections at the time this report was written.

Bicycle Facilities

There are painted bicycle lanes that are generally in good condition on both sides of the street for the entire length of the study area. The intersecting streets of Buchanan, Circle, Walnut, Conifer, and Elks Drive also have bike lanes. There is a paved bike path that runs parallel to 9th Street approximately 500 feet to the east, between Buchanan Avenue and Circle Blvd. Bike lanes on 10th Street parallel 9th Street to the west.

Comparison of Existing Width to Standards
Table II-4 shows the existing width of driving lanes for the various segments of 9th Street. The width is more than 10 feet wide throughout the study area. The City of Corvallis Development Code requires a minimum of 10 foot width for arterials and recommends 12 foot width, when possible (Appendix II-B).

Tables II-5 A & II-5 B show the width of sidewalks, bike lanes and planter strips along the study area. Appendix II-C shows the City of Corvallis and ODOT's standards for sidewalks and bike lanes. There are some small segments of 9th Street that do not meet the current City Development Code Standards and ODOT standards for sidewalks and bicycle lanes. For more analysis of this issue, see Chapter IV - Deficiencies and Needs.

Table II-4
Width of Driving Lanes*

Street Segment	Lane Width (ft)	Center Lane Width (ft)
Polk – Reiman	10	11
Reiman – Buchanan	10	11
Buchanan – Grant	10.75	11
Grant – Garfield	10	11
Garfield – Circle	10.25	11
Circle – Walnut	10.5	12
Walnut – Conifer	10.5	12
Conifer – Elks	11	--

*Individual lane measurements may vary up to .25 feet
Source: City of Corvallis

Table II-5 A
Width of Sidewalks, Bike Lanes and Planters (East Side)

Segment	Segment Length (Ft.)	Sidewalk Width (ft)	Bike Lane Width (ft)	Planting Strip Width & Condition
South Project Limit - Polk	164	5'	4	Narrow street side planter
Polk – Reiman	892	5'	5'8"	None
Reiman - Sunnybrook	471	5'8"	4'10"	Not street side
Sunnybrook - Buchanan	326	4'4"	5'6"	Not street side
Buchanan - Cornell	970	5'	5'	Inconsistent street side planter
Cornell - Starker	359	5'	5'	No street side planters
Starker - Circle	3,920	5'-9'8"	5'-6'	Well kept street side planter
Circle - Walnut	2,017	5'	5'	Inconsistent street side planter. Overgrown plants encroaching sidewalk
Walnut - Conifer	1,128	5'	5'	Street side, well kept
Conifer - Elks	1,366	n/a	5'	None
Total	**11,613**			

Table II-5 B Width of Sidewalks, Bike Lanes and Planters (West Side)				
Segment	**Segment Length (Ft.)**	**Sidewalk Width (ft)**	**Bike Lane Width (ft)**	**Planting Strip Width & Condition**
Fremont - Buchanan	1,330	4'4"-5'8"	4' -4'8"	Narrow
Buchanan - Beca	1,102	5'	5'	None
Beca - Grant	550	5' -9'8"	5'	No street side planters
Grant - Hayes	755	5'4"	6'	No street side planters
Hayes - Garfield	596	5'4"	6'	Wide planting strip next to road
Garfield - Spruce	1,773	5'	6'	Majority has planting strip along street
Spruce - Circle	487	5'	5'	12 foot wide –paved
Circle - Sycamore	509	5'	5'	12 foot wide –paved
Sycamore - Sequoia	407	5'	5'	13 foot wide –paved
Sequoia - Linden	349	5'	5'	Overgrown in spots
Linden - Oak	436	5'	5'	None
Oak - Walnut	309	5'	5'	None
Walnut - Hemlock	444	5'	5'	None
Hemlock - Ponderosa	304	5'	5'	Narrow, incomplete street side planter
Ponderosa - Conifer	386	5'	5'	None
Conifer - Maxine	337	5'	5'	None
Maxine - Elks	1,036	5'	5'	Wide street side planter – not maintained
Total	**11,613**			
Grand Total (Both Sides)	**23,226**			

Transit
Route No. 2 of the Corvallis Transit System (CTS) covers the entire length of the study area. Route No. 1 travels between Circle and Walnut Boulevards and Route No. 7 runs on 9th Street, between Circle Blvd and Elks Drive. These routes run on one-hour headways, Mondays through Saturdays. The first daily run begins at 7:15 a.m. and the final run is at 6:15.

The Linn-Benton Loop, an intercity transit service between Albany and Corvallis also serves 9th Street up to Circle Blvd. Appendix II-D shows the route and the schedule of this shuttle service.

The study area has 12 transit stops for northbound buses, four of which have shelters. There are 13 transit stops for southbound buses, eight of which have shelters. There is a bus bay on the east side of the Street, between Polk and Fremont Avenues. All other bus stops are on the traffic and bike lanes. The bus bay is used also by school buses. Map II-4 shows the location of bus stops in the study area.

Parking
There are no public parking structure on 9th Street, and curbside parking is prohibited along 9th Street. Curbside parking is, however, allowed on the intersecting avenues. The majority of businesses along 9th Street have customer parking in front of their business. Major business provide large off-the- street parking lots. Examples of these are parking lots in front of Plaza 9, the Corvallis Market Center, Bi-Mart, and Rite-Aid (See Major Activity Centers).

Traffic Volume
Average traffic volume within the study area ranges from 2,400 vehicles per day south of Elks Drive to more than 20,000 vehicles per day south of Circle Blvd. The traffic volume between Circle Blvd and Walnut Blvd drops to 13,000 per day. The average volume in the vicinity of Buchannan Avenue is approximately 15,700.

Major Trip Generators

The total traffic volume on 9th Street includes vehicles that pass through the study area and traffic generated by the business along 9th Street. It is important to identify the businesses that generate a high number of trips to understand the traffic characteristics of the study area. Not only does trip generation by individual businesses contribute to overall traffic volume, but ingress and egress to these businesses interferes with the flow of traffic and causes traffic safety problems for vehicles and pedestrians.

For this study, major trip generators have been identified through use of the Institute of Transportation Engineers (ITE) Trip Generation, 7th Edition manual. The ITE publication provides estimates of the number of trips that specific types of land uses will generate on a daily basis, as well as during the evening (PM) peak hours. PM peak is selected because it generally represents the highest volume of traffic in 24 hours. Major trip generators are defined as facilities that are estimated to generate 100 or more gross trips during the peak P.M. hours. It should be noted that these estimates are based on a few samples from across the country and may not necessarily correspond to the specific characteristics of land uses on 9th Street. Nonetheless, the ITE Trip Generation is the only recognized tool of the trade across the country. Table II-6 shows major trip generators along 9th Street.

Fast food outlets are the dominant type of major trip generator in the study area with eight restaurants generating a total of 1,200 PM peak trips. Six of those restaurants are concentrated within a 950 foot segment of the corridor.

Rite Aid generates 488 peak PM hour trips which is the highest number for any single site in the corridor. Border's Books is the second largest trip generator with 431 P.M. peak hour trips. The Corvallis Market Center is not currently fully occupied, however based on square footage of the Center it will be the third largest trip generator with 305 PM peak hour trips when it is fully occupied. The fourth highest number of trips is generated by the OSU Federal Credit Union with 303 trips.

Table II-6
Major Trip Generators, 2008

Trip Generator	Address	ITE # (Land Use Category)	Trip Generation Factor[1]	Trips	
				Weekday	Weekday P.M. Peak Hour
TG Market	1621 NW 9th St.	852	2,832	NA	103
Taco Bell	2235 NW 9th St	934	2,204	1,093	103
76 Filling Station/Convenience Store	1450 NW 9th St.	945	8 pumps	1,302	109
Elmer's Restaurant	1115 NW 9th St.	932	5,887	749	111
Izzy's Restaurant	2475 NW 9th St.	932	6,041	768	114
Goodwill Store	800 NW Starker Ave.	815	20,960	1,174	114
Wendy's	2300 NW 9th St.	934	2,599	1,289	121
Shell Filling Station	2635 NW 9th St.	944	8 pumps	1,348	125
Baja Fresh	839 NW 9th St.	933	2,399	1,718	126
Chevron Filling Station/Convenience Store	1334 & 1340 NW 9th St.	945	10 pumps	1,628	136
McDonald's	2250 NW 9th St.	934	3,174	1,575	148
Subway	2350 NW 9th St.	933	2,860	2,048	150
Kentucky Fried Chicken	1775 NW 9th St.	934	3,233	1,604	151
Regal Cinema	1750 NW 9th St.	444	4 screens	NA	151
7-11 Convenience Store	2641 NW 9th St.	851	2,842	2,097	152
Togo's Sandwiches	2317 NW 9th St.	933	2,960	2,119	155
Carl's Jr.	800 NW 9th St.	934	3,484	1,728	163
Arby's	2503 NW 9th St	934	3,848	1,909	180
Burger King	2408 NW 9th St.	934	3,960	1,965	185

Table II-6
Major Trip Generators, 2008

Trip Generator	Address	ITE # (Land Use Category)	Trip Generation Factor[1]	Trips	
				Weekday	Weekday P.M. Peak Hour
Linn-Benton Center	757 NW Polk Ave.	540	1,567 students	1,880	188
Plaza 9 Center	1829 to 1897 NW 9th St.	814	37,720	1,672	189
BiMart	2045 9th St.	815	36,087	2,022	196
Avery Square	815 NW 9th St.	710	550 employees	1,826	253
OSU Fed. Credit Union	1980 NW 9th St.	912	4 auto-teller lanes	1,645	303
Corvallis Market Center[2]	1500 NW 9th St.	820	81,236	3,488	305
Border's Books	777 NW 9th St	868	22,077	NA	431
Rite Aid[3]	922 NW Circle Blvd.	880, 820, 816, 850, 710, 150	82,296	NA	488

[1] Unless noted otherwise, trip generation factors are shown as gross square footage of buildings
[2] Currently not fully occupied. "Trips" generated are based on full occupancy of existing structures.
[3] "Trips" generated derived from a site development study/proposal completed on 11/5/2007.

Crash Study

For the purposes of this study, five years of crash history (2003 through 2007) on 9th Street was analyzed. The data used for the analyses was compiled by ODOT's Crash Analysis and Reporting Unit from reports submitted by individual drivers and police crash reports.

During the five year period there were a total of 216 crashes on 9th Street. There were also six "intersection related" crashes on intersecting streets that were included in the analysis.

Overall, the crash data seems consistent with the type of traffic that is generally observed in the study area. The many driveways and intersections along 9th Street generate a high number of turning movements, as well as vehicles stopping in travel lanes as they wait to turn. Table II-7 shows that intersections and areas within 50 feet of intersections were the primary crash locations. Crashes within intersections combined with other crashes that were intersection related accounted for more than 48 percent (107 crashes) of the 222 crashes in the study area. An additional 18.5 percent (41 crashes) of crashes occurred within 50 feet of an intersection. Map II-5 identifies the locations of the crashes.

Three intersections - Circle, Conifer, and Buchanan - were the sites of more than 54 percent of all intersectional, and intersection related crashes. The Circle intersection had the most crashes with 27, followed by Conifer with 17 crashes and Buchanan with 14 crashes.

There were 202 crashes between vehicles, 14 bicycle/vehicle crashes, 4 pedestrian/vehicle crashes, and one vehicle crash with a fixed object. One of the pedestrian crashes was fatal while 90 crashes resulted in non-fatal injuries.

The Statewide Crash Data System used by ODOT assigns a "collision type" to each crash. The collision type describes "the physical relationship of the vehicle(s) at the time of collision based on their intended path of travel." Two types of collisions in the study area accounted for more than 75 percent of all collisions. Over the five year period, there were 98 (44 percent) turning movement collisions and 69 (31 percent) rear end collisions. Angle collisions, which occur when one vehicle attempts to cross the path of an oncoming vehicle by entering the roadway from an intersecting street or a driveway, were the third most prevalent collision type with 24 occurrences. The remaining 31 crashes were represented by a variety of collision types including head-on, pedestrian and side-swipes. Table II-8 shows all of the collision types.

The predominant cause of crashes in the study area, shown in Table II-9, was the failure of drivers to yield the right of way, which caused 81 crashes or 36.5 percent of the crashes. Following too closely was the cause of 54 crashes (24.3 percent). Disregarding traffic signals, improper lane changes, and improper turns accounted for a total of 50 more crashes.

Table II-7
Crashes by Distance from Intersecting Street, 2003 - 2007

Intersecting Street	Within intersection or intersection related	1 to 50 feet from intersection	More than 50 feet from intersection	Total
Polk St.	5	2	1	8
Fremont St.	1	0	1	2
Reiman Ave.	0	0	2	2
Buchanan	14	9	6	29
Cornell St.	2	0	1	3
Starker St.	1	1	0	2
Grant Ave.	9	3	3	15
Hayes Ave.	1	2	2	5
Garfield St.	7	3	5	15
Spruce St.	5	5	13	23
Circle Blvd.	27	11	31	69
Sycamore St.	1	0	0	1
Sequoia Ave.	2	1	1	4
Linden Ave.	1	1	0	2
Oak St.	1	0	0	1
Walnut Blvd.	10	2	7	19
Hemlock Ave.	1	0	0	1
Conifer Blvd	17	1	1	19
Elks Dr.	2	0	0	2
Total Crashes	107	41	74	222

Table II-8 Crashes by Collision Type, 2003-2007		
Collision Type	**Number**	**Percent**
Turning movement	98	44.1%
Rear-end	69	31.1%
Angle	24	10.8%
Sideswipe-overtaking	18	8.1%
Backing	4	1.8%
Pedestrian	4	1.8%
Sideswipe-meeting	2	0.9%
Fixed or other object	1	0.5%
Head-on	1	0.5%
Miscellaneous	1	0.5%
Total	222	100.0%
Note: Fourteen of the crashes involved bicycles.		

Table II-9 Crashes by Cause, 2003-2007		
Cause	**Number**	**Percent**
Didn't yield right of way	81	36.5%
Followed too closely	54	24.3%
Disregarded R-A-G traffic signal	18	8.1%
Improper turn	16	7.2%
Improper lane change	16	7.2%
Inattention	13	5.9%
Speed too fast for conditions (not exceeding limit)	8	3.6%
Passed stop sign	6	2.7%
Other improper driving	6	2.7%
Improper overtaking	2	0.9%
Other (not improper driving)	1	0.5%
Inadequate or no brakes	1	0.5%
Total	222	100.0%

Crash Comparison

Crash data for a 1.24 mile segment of 9th Street was compared with the crash histories for two other roadway segments with generally similar characteristics. The data for all three segments covered the period 2003 through 2007. The 9th Street segment extended from the Fremont Avenue intersection to the Circle Boulevard intersection. The two comparison segments were: 1.24 miles of South Third Street (OR 99W) in Corvallis that extended from the Goodnight Street intersection northward to the Chapman Place intersection; and, 1.28 miles of Santiam Highway (US 20) in Albany that extended from the intersection of Burkhart Street to the intersection of South Commercial Way SE.

The three comparison segments have the following similarities:

- All segments have four travel lanes, a center turn lane and bike lanes;
- Average Daily Traffic (ADT) counts at the locations with maximum traffic were 21,000 for 9th Street (2008), 23,000 for South 3rd (2007), and 24,800 for Santiam Highway (2007);
- All of the segments have numerous public intersections;
- All of the segments have numerous private access points;
- The predominant land use along each of the segments is commercial.

Observations

As shown in Tables II-10 through II-13, the crash data for each of the segments tends to mirror the actual physical characteristics of the segments. While the roadways and ADTs of each segment are similar, there are unique features related to the segments that have an impact on the crash data that is summarized in tables below. The most notable aspect of the data is the wide range of crash incidence among the segments with 291 crashes, followed by the 9th Street segment with 161 crashes and South 3rd's much lower 74 crashes. Possible explanations for the differences are:

- Santiam Highway has four major signalized four-legged intersections compared to three intersections of that type in the 9th Street segment and only one of those intersections on South 3rd. This difference appears to be related to the higher number of crashes that occurred in intersections or within 50 feet of intersections.

- Although all of the segments are predominantly commercial, the Santiam Highway segment has areas with higher commercial concentrations than 9th Street and South 3rd.

Due to the configuration of 9th Street, it is not likely that more four-legged, signalized intersections will be created on the street to contribute to higher crash rates. However, in the future it is likely that there will be a higher level of commercial concentration on the street which will bring a somewhat higher number of crashes. This scenario indicates the importance of considering public transportation improvements for the area in tandem with private commercial development.

Table II-10 Crashes by Distance from Intersecting Streets, 2003-2007				
Street	**Within intersection or intersection-related**	**1-50 feet from intersection**	**More than 50 feet from intersection**	**Total**
9th Street (Freemont to Circle)	68 (42.2%)	33 (20.5%)	60 (37.35)	161
S. 3rd street (Goodnight to Chapman Place)	41 (55.4%)	4 (5.4%)	29 (39.2%)	74
Santiam Hwy in Albany (Burkhart to S. Commercial Way SE)	181 (62.2%)	48 (16.5%)	62 (21.3%)	291

Table II-11 Crashes by Collision Type, 2003-2007						
	9th Street		**S. 3rd Street**		**Santiam Hwy (Albany)**	
Collision Type	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Turning movement	71	43.8	27	36.5	97	33.3
Rear-end	54	33.3	29	39.2	139	47.8
Angle	14	8.6	5	6.8	25	8.6
Sideswipe-overtaking	14	8.6	5	6.8	13	4.5
Backing	3	1.9	1	1.4	3	1.0
Pedestrian	3	1.9	1	1.4	5	1.7
Sideswipe-meeting	1	0.6	-	-	1	0.3
Fixed or other object	-	-	4	5.4	2	0.7
Head-on	1	0.6	1	1.4	4	1.4
Miscellaneous	1	0.6	1	1.4	-	-
Non-collision	-	-	-	-	2	0.7
Total	162	99.9	74	100.0	291	100.0
	8 involved bikes		14 involved bikes		10 involved bikes	

Table II-12 Crashes by Cause, 2003-2007						
	9th Street		S. 3rd Street		Santiam Hwy (Albany)	
Cause	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Didn't yield right-of-way	57	35.2	21	28.4	79	27.2
Followed too closely	45	27.8	18	24.3	97	33.4
Disregarded R-A-G traffic signal	14	8.6	3	4.1	26	9.0
Improper turn	13	8.0	4	5.4	12	4.1
Improper lane change	15	9.3	3	4.1	11	3.8
Inattention	8	4.9	7	9.5	17	5.9
Speed too fast for conditions (Exceeding speed limit)	4	2.5	6	8.1	18	6.2
Passed stop sign	-	-	1	1.4	2	0.7
Other improper driving	4	2.5	5	6.8	14	4.8
Improper overtaking	1	0.6	1	1.4	2	0.7
Other (not improper driving)	1	0.6	-	-	1	0.3
Inadequate or no brakes	-	-	1	1.4	1	0.3
Driver drowsy/fatigued/sleepy	-	-	1	1.4		0.0
Careless driving	-	-	2	2.7	3	1.0
Reckless driving	-	-	1	1.4	-	-
Drove left of center on two-way road	-	-	-	-	4	1.4
Disregarded other traffic control device	-	-	-	-	1	0.3
Non-motorist illegally in roadway	-	-	-	-	1	0.3
Vehicle lost load or load shifted	-	-	-	-	1	0.3
No cause associated	-	-	-	-	1	0.3

Table II-13 Crashes by Severity, 2003-2007						
	9th Street		S. 3rd Street		Santiam Hwy	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Fatal crash	1	0.6	0	0	1	0.3
Non-fatal injury crash	63	38.9	46	62.2	145	49.8
Property damage only crash	98	60.5	28	37.8	145	49.8
Total	162	100.0	74	100.0	291	99.9
Fatal crash	1	0.6	0	0	1	0.3

Chapter III
Traffic Operation

There are seven traffic signals within the 9th Street study area. These are at Polk, Buchanan, Grant, Garfield, Circle, Walnut and Conifer. The traffic signals at Buchanan, Grant, Garfield, Circle and Walnut are fully actuated for vehicles (underground loop) and for pedestrian (pedestrian buttons). These traffic lights are equipped with opticom signal for emergency vehicles. The Polk Avenue traffic signal is for pedestrian crossing only and is located at a midpoint between the eastern and western legs of Polk Avenue which are about 60 feet apart. The location of this traffic light has been a source of confusion, particularly to the vehicles turning from east to south. The traffic signals on 9th Street are not synchronized.

Table III-1 shows an inventory of traffic lights within the study area.

Table III-1
Traffic Signals on 9th Street

	Intersection	No. of Phases	Loop Actuated	Pedestrian Actuated	Opticom
1	Polk Ave	NA	No	Yes	Yes
2	Buchanan Ave	6	Full	Yes	Yes
3	Grant Ave	5	Full	Yes	Yes
4	Garfield Ave	6	Full	Yes	Yes
5	Circle Blvd	8	Full	Yes	Yes
6	Walnut Blvd	8	Full	Yes	Yes
7	Conifer Blvd	NA	No	No	NA

Intersection Operation Analysis
Each of the 9th Street intersections in the study area was analyzed for current and projected capacity. In addition to major 9th Street intersections, the adjacent intersections on Highway OR 99W were also included in the analysis due to their direct impacts on the 9th Street traffic operation. The consulting/engineering firm of PTV America, Inc. was hired to perform operation analysis on the following intersections. This entire work is included as Appendices III-A and B.

1. 9th Street and Buchanan Ave
2. 9th Street and Grant Ave.
3. 9th Street and Garfield Ave.
4. 9th Street and Circle Blvd.
5. 9th Street and Walnut Blvd.
6. 9th Street and Conifer Blvd.
7. OR 99W and Circle Blvd.
8. OR 99W and Walnut Blvd.
9. OR 99W and Conifer Blvd.

The intersections of Elks Dive with 9th Street and Highway OR 99W were excluded from this round of analyses due to the fact that these intersections have recently been analyzed as part of the Good Samaritan Hospital's expansion plan. The City of Corvallis, ODOT and the hospital are in the process of developing improvement measures for those two intersections.

Table III-2 shows the results of intersection operation analyses for now (2008) and for future (2030). The current operation analysis is based on the latest volume and turning movement data. The future performance analysis is based on the results of the travel demands forecasting model. The table uses volume to capacity ratio (V/C) and Level of Service (LOS), two commonly used metrics for measuring intersection performances.

> ***V/C Ratio****. V/C Ratio is the volume of traffic on a given facility divided by the capacity of that facility. Generally, a v/c ratio of 1 or more indicates excessive volume over capacity (congestion) and less than one indicates the existence of additional capacity.*
>
> ***Level of Service****. LOS is a qualitative measure from A (best) to F (worst) describing operational conditions of a travel facility. In this exercise, LOS is used as a qualitative representation of V/C Ratios.*
>
> ***Mobility Standards****. The metrics used by the City of Corvallis for measuring the performance of an intersection under the City's jurisdiction is different from the one used ODOT for the State facilities. The City of Corvallis uses LOS while ODOT uses v/c ratios. Also, the City of Corvallis allows an LOS of D for the City's arterials while ODOT's Mobility Standards require improvement of such facilities. For more detail on Mobility Standards see Appendix III-C. Table III-2 uses ODOT's v/c ratio of 0.85 and an LOS of D for local intersections, as the minimum acceptable Mobility Standards.*

Table III - 2
Intersection Analyses

No.	Intersection	Mobility Standards	2008		2030	
			V/C	LOS	V/C	LOS
1	9th St. & Buchanan	LOS D	0.66	B	0.68	B
2	9th St. & Grant	LOS D	0.51	A	0.59	A
3	9th St, & Garfield	LOS D	0.43	A	0.51	A
4	9th St. & Circle	LOS D	0.89	D	1.08	F
5	9th St. & Walnut	LOS D	0.55	A	0.65	B
6	9th St. & Conifer	LOS D	0.37	A	0.29	A
7	99W & Circle	0.85	0.86	D	1.18	F
8	99W & Walnut	0.85	0.51	A	0.94	E
9	99W & Conifer	0.85	0.81	D	0.90	E

Intersection Improvements

Three layers of improvements are recommended based on the current or future deficiencies of intersections. Layer 1 includes improvements needed to local intersections to mitigate future deficiencies. Layer 2 includes modifications that are warranted by a recommended change to the interaction of Conifer Blvd and Highway 99W. Layer 3 includes all other improvements that would be warranted to make these intersections perform acceptably.

> **Modified Conifer Blvd Scenario**. The implementation of the Good Samaritan Hospital expansion plan and the resulting improvement to the intersections Elks Drive with 9th Street and Highway 99W warrant the closure of westbound Conifer Blvd between 9th Street and Highway 99W. As part of this closure the eastbound left turn can become a dual left turn and all other movements will be allowed. This closure will divert a large amount of traffic onto Walnut Blvd.

Table III-3 shows a summary of all modifications recommended.

Table III-3
Intersections - Recommended Improvements

Intersection	Layer 1	Layer 2	Layer 3
9th St. & Circle	Circle Blvd: Add westbound right turn lane. 9th St: Add southbound and northbound right turn lane. Add right turn overlap phase to southbound and northbound approach. Lengthen northbound left turn lane to 260 ft.	None	None
9th St. & Walnut	None	Add one left turn lane on westbound (dual left turn)	None
9th St. & Conifer	None	Close westbound approach toward 9th St.	None
99W & Circle	Circle Blvd Add right turn overlap phase to eastbound approach. Lengthen westbound left turn lane to 270 ft. Highway 99W Add southbound/northbound right turn lane	Circle Blvd Add one lane to westbound left turn lane (dual left turn)	Circle Blvd Add westbound right turn lane.
99W & Walnut	Add southbound right turn lane.	Lengthen southbound left turn lane	Add westbound right turn lane.
99W & Conifer	None	Close westbound approach toward 9th St.	Add eastbound second left turn lane.

Chapter IV
Deficiencies and Needs

The needs and deficiencies of the 9th Street study area were identified through technical analysis and by obtaining public input. Both approaches are summarized below.

Technical Analysis
The technical analyses carried out by project staff were based on:

1. Field surveys;
2. Review of databases with information about existing conditions, such as GIS data, US Census data, ODOT traffic volume reports, and ODOT crash data;
3. Observations of the movement of vehicles, buses, bicycles and pedestrians;
4. Comparison of the existing conditions to the professional transportation standards; and
5. Review of the issues with technical experts.

Public Input
The development of the 9th Street Improvement Plan included extensive public outreach efforts intended to:

1. Communicate the purpose and objectives of the project;
2. Recruit the public's assistance to identify issues and deficiencies on 9th Street; and,
3. Gain public input into the development of improvement strategies for the Plan.

An open house meeting was held on March 4, 2009 at the Cheldelin Middle School. The meeting was set up to function as a two-way conduit for the exchange of information among the public, project staff and members of the Project Advisory Committee (PAC). The public was requested to identify transportation and land use issues in the study area and to provide input to the 9th Street Improvement Plan. Project staff and members of the PAC received comments from the public and responded to their questions. Additional details on the structure and logistics of this open house meeting can be found in Appendix IV-A.

Analysis of Issues
Two categories of issues were identified through the technical analysis and public input process described above. The first category includes those issues that generally apply to the entire study area or a large extent of the study area. The second category contains issues that are related to specific locations in the study area.

A. Issues Related to the Entire Study Area

1. **The Study Area is Unfriendly to Pedestrian Crossing**
   The automobile orientation of 9th Street is not friendly to pedestrians' needs. Although there are sidewalks on both sides of the street, crossing the street poses a challenge to pedestrians. This is mainly due to the lack of designated locations where pedestrians can

safely cross the street. Places that are more in need of designated crosswalks are the area around the Cannery Mall and the Benton Center, the stretch between Circle Blvd. and Garfield Avenue, and the stretch between Circle Blvd and Walnut Blvd.

Although sidewalks are present on both sides of the street, the width of these sidewalks at some segments are below the standards. The City of Corvallis Development Code requires a minimum of 5 feet side walk for urban minor arterial, while ODOT's guidelines for the same street are 6 feet. See Tables II-5 A & B for the width of existing sidewalks.

2. The Study Area is Unfriendly to Bicycling

The difficulty with biking on 9th Street is attributed to the ingress and egress movements generated by the omnipresent driveways. Biking lanes are present on both sides of the street and there is no on-street parking to interfere with biking. The presence of debris in bike lanes was noted as an issue warranting attention.

When bike lanes were established on 9th Street they met the minimum standard of 5 feet wide (see Tables II-5 A & B). Today's standards for bike lanes are 6 feet wide (See Appendix II-C). Widening the bike lanes to the current standard would improve biking conditions. Widening bike lanes, however, would require additional right-of-way which is not available in most of the 9th Street study area.

Some members of the public suggested the continuation of bike lanes south of the study area to the downtown area. Extending bike lanes would not be feasible due to the lack of right-of-way and the narrowness of the traffic lanes south of the study area. Tenth and 11th Streets are better suited for a continuous north-south biking route, and there is a possibility for turning one of those streets into a bicycle boulevard. A bicycle boulevard is a shared roadway optimized for bicycle traffic.

3. There are Too Many Driveways

The inventory of driveways shown in Tables II-3 A & B reveals that there is generally a much higher number of driveways at closer spacing than recommended by the City of Corvallis Development Code and ODOT's guidelines for access management. Turning movements to and from these driveways frequently interfere with the flow of traffic which causes delays and hazardous situations. A detailed description of this situation is on page 9.

Consolidation of driveways and standardization of driveway widths would help increase the carrying capacity of the arterial and would improve the driving experience. However, the business community prefers the maximum possible access to their establishments. This interest is evident in the many comments that pointed to the importance of driveways to businesses along 9th Street.

It is important to maintain a balance between serving the needs of the businesses and maintaining the function of the arterial. Too many driveways would make the arterial inconvenient for everyone, including the customers, and would result in drivers avoiding the arterial when possible.

4. Lack of Trees and Landscaping Features

Although 9th Street, for the most part, has fairly good landscaping, there is generally an absence of trees. Trees provide enormous benefits to the street, among which are improving air quality, aesthetics, and a sense of calm for driving, walking and biking.

The planter strip is not uniform in width or location, as shown in Tables II-5 A & B. In some segments the strip is between the sidewalk and curb, and at other locations the sidewalk is between the curb and the planter strip. A major issue with the planter strip is maintenance. In some locations the bushes and shrubs have dried out or have overtaken the sidewalks. This is more of an issue in front of vacant businesses. This situation calls for the enforcement of landscape maintenance along the street.

5. Too Commercially Developed

It is not uncommon for cities of the size of Corvallis to concentrate commercial developments along one or two streets, and the dense commercial development in the study area has developed according to the City's zoning code. It appears that the public's unease about this issue is more attributable to the number of access points than to the type of development. The current zoning of the street, Mixed Use Community Shopping (MUCS) allows for the development of residential units to be mixed with commercial development.

6. Overwhelming Electric Wires and Poles

Another conspicuous feature of 9th Street is the presence of utility wires and poles that add to the visual clutter on the street. This is a very difficult situation to rectify as the utility companies own the wires and the poles and the cost of burying them is enormous.

7. Too Many Commercial Signs

It is common for a commercially zoned and developed arterial to have numerous commercial signs, and the presence of many commercial signs along 9th Street was identified as an aesthetic issue. The City of Corvallis Sign Ordinance controls the number, size and height of these signs. What needs to be examined is whether the number, size and height of these signs conform to the City of Corvallis Sign Ordinance.

B. Issues Related to Specific Locations

1. Congestion at 9th and Circle Blvd

The intersection of Circle Blvd carries the heaviest traffic volume in the study area. This intersection and ten other key intersections were analyzed for operation improvements. See Chapter III: Traffic Operation.

2. PM Congestion at 9th Street and Conifer Blvd

This is in reference to the difficulties experienced by northbound traffic turning right and westbound traffic turning left at this intersection during PM peak hours. See Chapter III: Traffic Operation for an analysis of this intersection. The anticipated improvements of the Elks Drive and 9th Street intersection by the hospitals will improve the operation of this intersection.

3. Pedestrians Crossing in the Vicinity of Corvallis Market Center

The area between the Garfield and Circle Blvd. intersections was identified as a particularly difficult segment for pedestrians to cross due to the lack of crosswalks.

4. Visual Obstruction at NW Quadrant of 9th Street and Buchanan Ave.

There is a visual obstruction at northwest quadrant of this intersection. This obstruction affects eastbound vehicles turning north onto 9th Street. The City of Corvallis Transportation Plan for this intersection includes a left turn lane and a left turn signal. The visual obstruction will also be addressed.

5. Visual Obstruction by Bushes in Front of Taco Bell

The hedges in front of Taco Bell, on the bank of Sequoia Creek and the hedges on the NE quadrant of the Buchanan Avenue intersection were cited as visual obstructions.

Suggested Improvements
The public made the following suggestions for the improvement of 9th Street.

1. **Improve Pedestrian Safety**
   Suggestions for improving pedestrian safety included crosswalks, flashing yellow lights, cobblestone paving and the construction of pedestrian crossing bridges. A combination of crosswalks and yellow flashing lights is included among the Recommended Improvements in this plan. The cobblestone paving has high maintenance costs and does not guarantee pedestrian safety. The pedestrian bridges are also not feasible due to their high costs, aesthetics problems and generally low usage.

2. **Improve Bike Lanes by Enhancing their Maintenance**
   9th Street is swept as part of the City's regular street sweeping program. It will be monitored to determine if 9th Street requires more frequent sweeping than other arterials.

3. **Install Additional Transit Shelters**
   Due to the frequency of rainy days in Corvallis, members of the public felt that it would be desirable to have more transit shelters along 9th Street. An increase in the number of bus shelters is among the Recommended Improvements.

4. **Plant Trees and Develop Landscaping**
   This suggestion was included in the Recommended Improvements.

5. **Mix in Residential Developments to Improve Appearance and Create Calm**
   The current zoning designation on 9th Street allows the development of residential units, and many developments on 9th Street have the option of adding residential units on top of their structures. The calming affects of residential developments needs to be studied.

6. **Install a Raised Median - Planted**
   While there are many benefits in the construction of a raised median along the study area, several comments were against this improvement. The concerns were mostly about the need of motorists to cross the street. See Recommended Improvements.

7. **Reduce/Consolidate Access Points**
   While there are many benefits in the consolidation of access points, several business owners were against this improvement. A primary concern was that such a change would reduce traffic to their business. On the basis of the technical merits of this suggestion, a form of this improvement was included in the Recommended Improvements.

8. **Follow the Principles of "Smart Growth" Development**
   This suggestion refers to high density developments with mixed use, small stores, parking in the rear and emphasis on alternative modes of transportation. The study area is a built environment and the implementation of these types of recommendations will be contingent upon the rising of redevelopment opportunities. This recommendation was included in the Recommended Improvements.

9. **The Façades of New Developments Should be Facing the Street**
   This recommendation refers to façade treatments on front row developments in the Corvallis Market Center. Although the few front row developments in this shopping center have a false façade facing the street, this does not result in the same benefits as having their actual entrances on the street.

10. **Create a Break for Pedestrian Crossing between Garfield Avenue and Circle Blvd**
    This suggestion was included in the Recommended Improvements.

11. **Divert Some of the 9th Street Traffic onto Hwy 99W**
    The difficulties with this suggestion are: a) it would require an additional intersection on Highway 99W which is an access protected highway, and; b) most vehicles travelers on 9th Street have a destination on 9th Street.

12. **Return on Street Parking to North of Conifer Blvd**
    Such a change is not warranted as there is little or no business activity in that area. Furthermore, there is not enough right-of-way for on-street parking.

13. **No Right-Turn on Red at Circle Blvd Intersection**
    This would exacerbate the congestion at this intersection. If the reason for this suggestion is the safety of bicyclist, there are other measures to address this issue.

14. **Divert Most of Bicycling to Buchanan Pathway and 10th Street Bikeway**
    The Buchanan Pathway and 10th Street bikeway are currently available to bicyclists and are likely to be preferred if a bicyclist does not have to travel on 9th Street. It is assumed that most bicyclists using 9th Street have a destination on 9th Street.

15. **Extend Buchanan Pathway, along Hwy 99W, to the Cannery Mall on 9th Street, and;**

16. **Connect 9th Street Bike Path to the Riverfront Bike Path**
    The feasibility and benefits of the above two suggestions should be studied by the City of Corvallis Bicycle and Pedestrian Advisory Commission (BPAC).

Chapter V
Access Management

Access management is an approach to balancing the need for access to developed land with the need for safe and efficient movement of traffic. The number, location and spacing of access points along an arterial directly affect the flow and safety of traffic on that arterial. Ingress and egress movements at access points interfere with the flow of traffic, cause congestion and increase the likelihood of accidents. Access management involves careful control of location, type, and design of access points and intersections, and it is one of the most effective means of enhancing safety and preventing the deterioration of roadway functions.

Some of the most effective tools of access management are:

1. **Driveway Reduction**. Reducing the number of driveways within a certain distance improves the flow of traffic and reduces the number of conflict points. This can be achieved by:
    a. Closure of excess driveways;
    b. Consolidation of two or more driveways into a shared one;
    c. Relocation of driveways to a side street;

2. **Median Treatment.** Medians are constructed in areas with dense commercial development to mitigate the conflicts caused by left turn movements. The two common types of medians are two-way left-turn lanes (TWLTLs) and raised medians.

    a. **Two-Way Left-Turn Lane**. A TWLTL, such as the one on 9th Street, is a center lane dedicated to the storage of left-turning vehicles (Fig. V-1). The lane allows left turning vehicles to queue out of the main flow of traffic and avoid traffic back ups;

    b. **Raised Median**. A raised median or non-traversable median is a center-road structure that divides the roadway and prevents crossover traffic. A raised median may be continuous or partially cover the distance between two intersections. A raised median may provide openings only for left-turning vehicles (Directional Opening) or for all traffic (Full Opening). Figures V-2 shows a raised median with a directional opening and V-3 shows a raised median with a full opening.

3. **Traffic Signal Spacing**
    Traffic signals constrain capacity of a roadway, particularly during peak travel periods. The number of traffic signals influences the performance of the roadway. Establishing traffic signal spacing criteria is among the most important access management techniques.

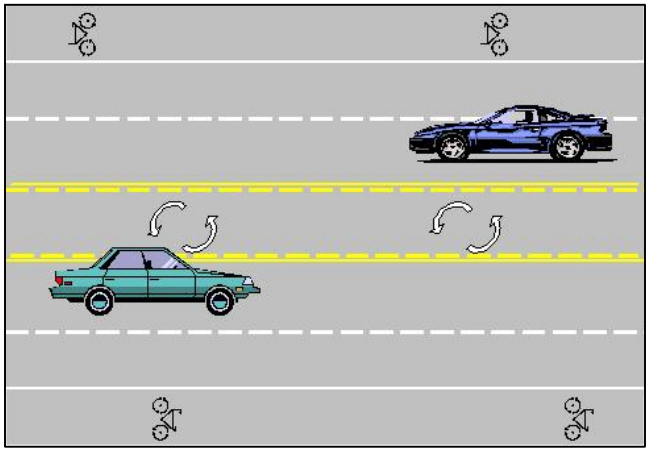


Fig. V-1: Two-Way Left-Turn Lane (TWLTL)

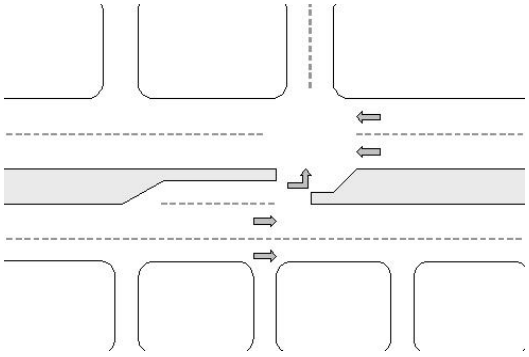


Fig. V-2: Raised Median with Directional Opening (One-Way Left-Turn)

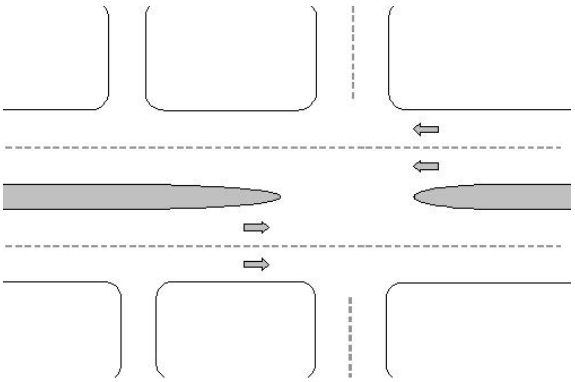


Fig. V-3: Raised Median with Full Opening (Two-Way Left-Turn)

4. **Corner Clearance**. Corner Clearance is defined as the minimum distance required between an intersection and the nearest driveway. Driveways are not to be placed in the functional area of an intersection. Inadequate corner clearance results in blocked driveways, confusing movements at intersections and inadequate weaving distances. The American Association of State Highway and Transportation Officials (AASHTO) provides recommendations for corner clearance as a function of speed.

5. **Frontage Road.** A frontage road is a road that runs parallel to the main road. A frontage road allows full access to developments while it substantially reduces the conflicts with the main flow of traffic. Major drawbacks of frontage roads are the required right of way and the queues that are formed at the points where frontage roads merge with the main road.

6. **Reconfiguration of Access Points.** The following are some of the most common modifications to existing driveways that improve roadway operation and safety:

    a. Channelizing driveways to discourage or prevent left-turn maneuvers. This is done by constructing a triangular island in the entrance of driveway, commonly referred to as "right-in right-out, Fig. V-4;
    b. Requiring access on a collector street, when available, in lieu of an additional driveway on the main roadway;
    c. Regulating the maximum width of driveways;
    d. Limiting turning movements at driveways by use of signs, especially left turns;
    e. Aligning driveways on both sides of the street;
    f. Locating a driveway directly across from a T-intersection and installing a traffic signal if warranted; and
    g. Encouraging off-street connections between adjacent properties, even when each has a street access.

Evaluation of Raised Medians

Access management techniques vary in terms of effectiveness in improving traffic operation and safety. While there are studies that confirm that two-way left-turn lanes are substantially safer and more efficient than having no median, raised medians have proven to be even safer and more efficient. Raised medians separate opposing directions of travel, and thereby eliminate the potential for head-on accidents. They efficiently regulate left turns and other crossover traffic movements. Raised medians help reduce conflict points along a road segment and facilitate a more uniform speed. Additionally, raised medians provide better pedestrian protection than undivided roadways and provide a space for landscaping and other aesthetic treatments. The raised median does not have to be as wide as a TWLTL, and can yield additional right of way for other facilities such as driving lanes, sidewalks, bike lanes and planter strips.

By restricting left-turn egress from driveways along an arterial, raised medians create a need for the provision of U-turns. The most common methods for accommodating U-turns are dual left-turn bays at signalized intersections (inside lane allowing U-turns), openings in the raised median for permissible U-turns, and "jug-handles," (Fig. V-5). In the absence of these provisions, vehicles would resort to using side streets for U-turns.

Where left turns or U-turns are permitted, it is essential that the medians provide separate lane with adequate storage (minimum 4 cars). Otherwise, the benefits of removing left-turning vehicles from the through-travel lanes will be lost. It is also important to note that given the same amount of traffic, the left turning volumes at intersections followed by raised medians are higher than intersections followed by two-way-left-turn lane. However, a mid-block opening in a raised median would help reduce the left-turning volume. A safety drawback of raised medians is the increase in rear-end accidents at the median openings.

Fig. V-4 Right-in Right-out Driveway

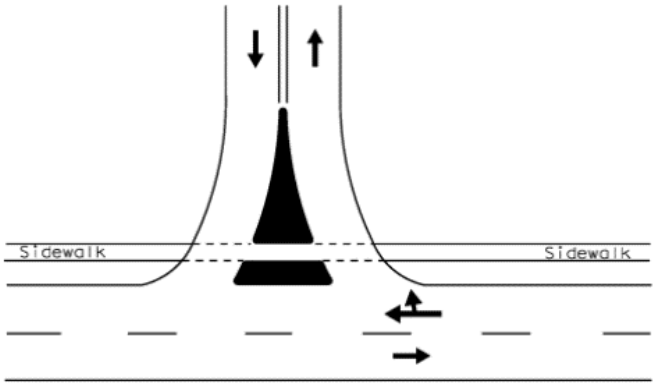
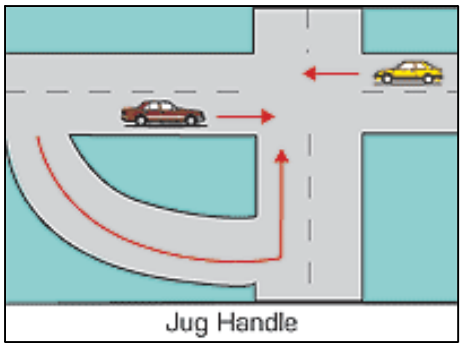


Fig. V-5 Jug-handle



In spite of their overall safety and operational benefits, owners and occupants of developed properties often have concerns about how raised medians will affect access to their sites. A common belief is that local businesses that depend on pass-by traffic are adversely affected by medians. Contrary to this belief, surveys conducted in Texas, Iowa and Florida show that the vast majority of business owners have indicated no discernable decline in sale after the construction of a raised median[4]. Another study in Texas indicates that corridors with access control improvements have experienced 18 percent increase in property value after the construction of raised median[5]. Finally, it is important to note that the impact of raised medians on businesses depends on the type of business, location of the opening and the traffic volume.

Administrative Tools of Access Management

The legal basis for the management of public and private access points are: a) the public right to safe and efficient movement of traffic and; b) a land owner's right to suitable access to property. It is a responsibility of government to provide for safe and efficient movement of traffic on public roads. Given these seemingly opposing interests, state and local governments have adopted statutes, regulations and policies that aim at balancing the use of governments' authority and the protection of property rights. The Fifth Amendment of the US Constitution prohibits governments from taking property rights without just compensation. Weighing these authorities and limitations, the courts have established that local governments must demonstrate a rational nexus between the burden realized by the property owner and the furthering of public interests. It is noteworthy, however, that in the vast majority of access management cases, the public benefits of access management tend to outweigh the burden to the property owner.

The administrative authority for managing 9th Street access points is based on: a) State of Oregon Administrative Rules, OAR 734-051, and; b) the City of Corvallis Ordinances which are specified in adopted plans and the City's Development Codes.

[4] NCHRP, Report 420, Impacts of Access Management Techniques, Transportation Research Board, National Research Council, 1999.

[5] Ibid.

The state access management regulations apply only to state highways and roadways that intersect with state highways. The only location in the study area that may be subject to OAR 734-051 is the intersection of 9th Street and Elks Drive, due to its proximity to State Highway 99W.

Reviewed Access Management Techniques and Processes
In consideration of issues associated with retrofitting the built environment, this Plan reviewed three types of access management recommendations.

1. **Near-Term Improvements.** The near-term improvements were geometric design and traffic flow improvements that could be included in the City of Corvallis Capital Improvement Program (CIP) for adoption.

2. **Improvements Pending Development/Redevelopment**. While there are very few vacant lots left on 9th Street, there is potential for future redevelopment at several locations in the study area. This category of recommendations would be implemented when there are requests for permits to develop the remaining vacant lots or to redevelop a site.

3. **Long-Term Improvements.** Retrofitting of the built environment requires careful consideration of decisions and policies. Rather than developing a blanket policy for the entire study area, each access point requires an individual resolution based on an evaluation of the economic functions of each access point. The implementation of these recommendations will be contingent upon the results of additional studies and the intensity of safety issues.

Access Management Measures Considered for Recommendation

1. **Near-Term Improvements**
   - **a.** Following a careful examination of the functionality and value of the existing access points to the properties they serve, staff identified several segments in the study area where a short-distance raised median would have limited impacts on abutting properties. In determining the length of these medians, adequate clearance was considered for left-turning vehicles at major crossovers. The segments considered for the construction of raised medians are listed in Table V-I and shown on Maps V-1 through V-3. If implemented, the medians would be landscaped and constructed at appropriate locations a refuge for crossing pedestrians. These structures are believed to reduce the number of conflict points, provide a refuge for pedestrians and would introduce a sense of order and calm to the traffic at those locations.
   - **b.** Several businesses appear to have driveways that could be closed or consolidated with adjacent driveways. Efforts were made to encourage voluntarily reduction of these driveways.

2. **Improvements Pending Development/Redevelopment**

   a. Reduce the number of driveways, when possible.

   b. Eliminate access on 9th Street when access from an intersecting street could be allowed.

   c. Allow only right-in right-out driveways, when possible.

   d. Encourage sharing driveways.

   e. Maintain minimum clearing distances from intersections.

3. **Long-Term Improvements**

   a. Study the feasibility of reducing access points by consolidating additional driveways based on examination of access point situation along the study area. This may require the purchase of access rights and the offering of incentives and disincentives.

   b. Study the feasibility of constructing a continuous landscaped median with openings for permitted left turns and U-turns, from Polk Avenue to Walnut Blvd.

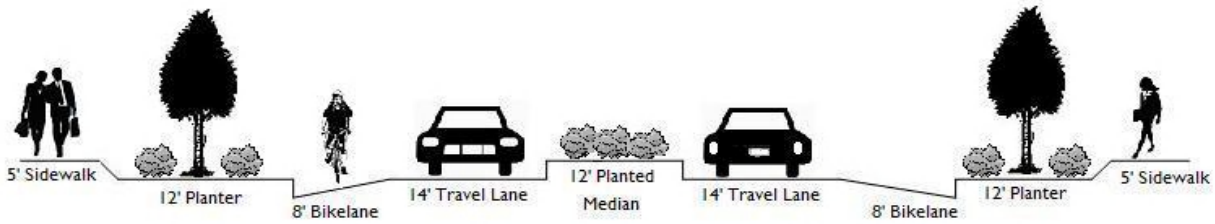
Note: For a final list of recommendations of this Plan, see Chapter VI: Recommended Improvements

Table V-1 Location of Proposed Landscaped Medians			
No.	**Landmark Location**	**Approximate Length (Feet)**	**Number of Affected Driveways**
1	East leg of Polk - Main Cannery Mall entrance	80	2 residential accesses (East side)
2	North of access between Cannery Mall and Avery Square – South of access between Avery Square and Baja Fresh (potential location for pedestrian-activated crossing)	160	Carl's Jr. 9th St access will be impacted- can become a right-in, right-out (West side)
3	Baja Fresh access – Dixon Creek	80	1 vacant lot access (West side)
4	Southern Sunnybrook access - 1025B 9th St (Farmer's Insurance)	115	1 residential access (West side)
5	Bus shelter (East side) - Shari's sign	75	1 vacant residential lot access (West side)
6	La Poderosa north access – Mick's sign	80	1 workshop access (East side)
7	In front of Corvallis Market Center	63	1 multi-business access (East side)
8	Randy Jones Chevrolet, between the two accesses	140	1 multi-business access (West side)
9	Splish Splash sign – Key Bank	74	Future development would use Office Max access
10	Office Max entrance – Plaza 9 north entrance	120	None
11	Taco del Mar entrance – Wild Birds Unlimited	85	2 business accesses consolidated (East side)
12	Requires further study - Bi-Mart south entrance – Bus stop in front of Rite Aid (contingent on turning lane requirements)	80	1 business access– right-in right-out (West side)

Alternative Solution

The technical group evaluated the following design option as an alternative solution to the improvement of 9th Street. Under this design option the street would be converted into one 14 feet wide driving lane on each direction. There would be a continuous 12 feet wide planted median on the center, 12 feet of planter strips on each side, 7 feet wide bike lanes and 5 feet wide sidewalks on both sides. Fig. V-6 below shows a profile of this design.

Fig. V-6, Alternative Design



Evaluation of Alternative Design

This design would improve the walkability of 9th Street. It would provide for a more convenient biking experience and would beautify the street by introducing more landscaped areas. Driving would be more steady and without interception by left-turning vehicles. This design would create a more community-oriented 9th Street by better accommodating the needs of alternative modes of transportation.

There, however, would be congestion and backups at intersections due to the reduction of driving lanes. The two driving lanes in each direction are currently needed to carry the high volume of traffic. The continuous planted median would increase the need for left-turn movements at intersections which would pose additional demand to the traffic carrying capacity of the intersections. Unless the two driving lanes are implemented throughout the length of 9th Street, there would be bottleneck problems at the points where two driving lanes merge into one lane. However, there is not 80 feet of right of way available south of Polk Avenue for the implementation of this design.

Chapter VI

Recommended Improvements

The following improvements are recommended to address transportation issues on 9th Street:

A. Walking Improvements

1. Widen the sub-standard sidewalks to maintain a minimum of 5 foot wide sidewalks on both sides of the street, per the City of Corvallis Development Code standards.
2. Provide for safe pedestrian crossing opportunities at the locations recommended below. The recommended crossing facilities should include pedestrian actuated flashing yellow light, crosswalk marking of the pavement and a short island on the center. The City of Corvallis Engineering Division will study the most appropriate locations for these crossing facilities based on considerations of feasibility, safety, highest use, transit needs, business access and impacts on traffic flow.
    i. Between Reiman Avenue and Fremont Avenue
    ii. Between Buchannan Avenue and Grant Avenue
    iii. Between Grant Avenue and Garfield Avenue
    iv. Between Garfield Avenue and Circle Blvd.
    v. Between Circle Blvd and Walnut Blvd contingent upon the results of feasibility study by the City Engineering Division.
3. Study the location of the existing mid-block pedestrian traffic signal near Polk Avenue to determine whether this traffic signal should be retained, removed, replaced with a signal like the one described in A2 (above) or relocated.

B. Bicycling Improvements

1. Widen the sub-standard bike lanes to 6 foot wide on both sides of the street, when right-of-way is available.
2. Add bike lane on Grant Avenue to connect 9th Street to 10th Street, per the City of Corvallis Transportation Plan.
3. Monitor the presence of debris on 9th Street bike lanes to determine if a more frequent sweeping regimen is warranted.

C. Transit Improvements

1. Increase the number of bus shelters for bus stops on 9th Street, where appropriate.
2. Provide pedestrian crossings as per section A above.

D. Landscaping Improvements

1. Encourage businesses to plant appropriate types of trees and require trees upon development/redevelopment, as per the Corvallis Development Code.
2. Improve landscaping between Polk Avenue and Walnut Blvd by adhering to the existing 12 foot planter strip standard required in the City Land Development Code.
3. Enforce the maintenance of planter strips by property owners, per the City Ordinance.

E. Access Management

***Note**: The following recommendations were initially included in this Plan as a tool of access management and safety enhancement:*

> *Construct landscaped medians at the locations identified in Table V-1 and Maps V-1 through V-3, and; study the feasibility of a continuous landscaped median along the study area.*

In response to strong opposition expressed by the public and especially by the business owners on 9th Street, the Project Advisory Committee on November 3, 2009 removed those recommendations from the Plan. This opposition was mainly based on a belief that the proposed median would reduce access to businesses and would pose awkward driving conditions. For more on the impacts of medians, see Evaluation of Raised Medians in previous chapter.

The following recommendations on Access Management apply only to new development and redevelopment of properties along 9th Street when such opportunities arise and in consideration of development locations relative to impacts on traffic flow or when requested by property owners.

1. Reduce number of driveways in the study area by eliminating, consolidating or relocating excess driveways, per the City Land Development Code.
2. Require right-in right-out channelization of driveways, per the City Land Development Code.

F. Traffic Flow Improvements

For detailed information on these recommendations, see Chapter III – Traffic Operation.

1. Implement the recommendations of the consultant's work on intersection capacity analyses to provide for the needed capacity at identified intersections.
2. Synchronize traffic lights along the study area.

G. Signs and Hanging Wires Improvements

1. Strictly enforce the City's sign ordinance.

2. Seek opportunities to minimize visual impacts of hanging wires, i.e., burying, bundling, or any other aesthetic improvements.

H. Land Use Improvements

1. Follow the requirements of the latest City of Corvallis Land Development Code to promote and implement the following practices:
    i. Mixed used development
    ii. Parking in the rear
    iii. Site building entrances near the street and facing the street
    iv. Emphasis on alternative modes of transportation.

Chapter VII
Implementation Plan

The availability of funding is a major factor affecting the implementation of the 9th Street Improvement Plan. The Plan will be implemented incrementally as funding is obtained. Therefore, it is important to identify funding sources and the activities for which they could be used in the implementation of the Plan.

Possible Funding Sources
The following is a brief description of federal, state and local funding sources that could be used to complete elements of the Plan. Additional funding opportunities may arise[6]:

1. **Surface Transportation Program (STP).** STP is a federal transportation block grant fund that is annually distributed to the states for roadway system improvements. Per a formula that is based on the population of the Urbanized Area, ODOT distributes approximately $600,000 of STP funds to the Corvallis Area MPO. The MPO Policy Board allocates the fund to the highest priority projects within the MPO area.

2. **Transportation Enhancement Program (TE).** The Transportation Enhancement program provides federal highway funds for projects that strengthen the cultural, aesthetic, or environmental value of our transportation system. The funds are distributed on a competitive basis for the improvement of (a) Pedestrian and Bicycle Facilities; (b) Historic Preservation projects related to surface transportation; (c) Landscaping and Scenic Beautification, and; (d) Environmental Mitigation activities.

3. **Oregon Bicycle and Pedestrian Program (OBPP).** The State of Oregon provides funding for the improvement of bicycle and pedestrian facilities within the state. The funds are distributed on a competitive basis to the eligible projects.

4. **System Development Charges (SDC).** SDCs are one-time fees imposed by the City on the owners of developing properties to pay for projects that improve future capacity of the city's streets, water, storm water, wastewater and parks.

5. **Corvallis Street Fund (CSF).** The City of Corvallis receives State of Oregon Highway Funds as a share of the gas tax and other transportation-related fees collected by the state.

6. **Federal Transit Administration's Section 5307 and 5309.** FTA provides federal dollars for the capital and operation improvements of transit systems. The City of Corvallis receives an annual allocation of Section 5307 funds. Section 5309 Funds are at the discretion of US Congress.

7. **Development/Redevelopment Projects**. If a development or redevelopment project will have an impact on transportation facilities, developers may be required to pay for a portion of transportation improvements needed because of the project.

[6] Per a policy of the City of Corvallis City Council, the city's general fund cannot be used for the improvement of transportation facilities.

Funding Process
To use the funding sources mentioned above, an improvement project must be included in at least one of the following planning or capital improvement documents:

1. **CAMPO Regional Transportation Plan (RTP)**. Developed and approved by the MPO, the RTP includes transportation projects anticipated for the next 20 years in the area. The RTP is updated every five years. The MPO is currently in the process of updating the RTP. This update provides an opportunity for including the recommendations of the 9th Street Improvement Plan in the RTP, a prerequisite for receiving federal improvement funds.

2. **CAMPO Transportation Improvement Program (TIP)**. The TIP is a short-range capital improvement program that contains priority transportation projects for funding over the next 2-3 years. The TIP is updated every two years, and is a federally required document for receiving federal funds. Projects in the TIP must be derived from an adopted RTP. Both the RTP and the TIP are fiscally constrained documents, in that, every plan or project must have a reasonably anticipated funding source. The MPO is in the process of updating its TIP.

3. **City of Corvallis Capital Improvement Program (CIP)**. The CIP is a 5-year program that identifies and prioritizes the city's current and future capital improvement projects. Projects in the first year of the CIP are fiscally constrained. All major improvement projects within the city must be included in the annual CIP and adopted by the City Council as a part of the annual budget.

4. **City of Corvallis Land Development Code (CLDC).** Consistent with the goals and policies of the City of Corvallis Comprehensive Plan, the Land Development Code regulates the type, design, and location of the city's developments.

Table VII-1 below provides a summary of recommendations, recommended funding sources and the documents required for the implementation of recommendations.

Table VII-1
Implementation Process

No	Recommendation	Recommended Funding Source	Prerequisite Document
A	**Walking Improvements:**		
	1. Widen substandard sidewalks to 5 ft.	TE/OBPP/CSF	TIP-CIP
	2. Provide for safe pedestrian crossings at 5 identified locations	TE/OBPP/CSF	TIP-CIP
	3. Evaluate the location of the existing crossing signal near Polk Ave	CSF	
B	**Bicycling Improvements:**		
	1. Widen substandard bikeways to 6 ft.	TE/OBPP/CSF	TIP-CIP
	2. Add bike lanes on Grant Avenue	CSF	
	3. Monitor the presence of debris on bikeways	CSF	
C	**Transit Improvements:**		
	1. Increase the number of bus shelters for bus stops	FTA Section 5307/5309	TIP-CIP
	2. Provide pedestrian crossings as per Section A, above	TE/OBPP/CSF	TIP-CIP
D	**Landscaping Improvements:**		
	1. Encourage businesses to plant appropriate type of trees	Business/landowner's responsibility/	City Land Development
	2. Adhere to the 12 ft planter strip standard, per the CLDC	Admin cost to the City	Code
	3. Enforce maintenance of planter strip, per the City Ordinance		
E	**Access Management:**		
	1. Reduce the number of driveways (elimination, consolidation)	Development/	City Land Development
	2. Require right-in-right-out channelization of driveways	Redevelopment/CSF	Code

No	Recommendation	Recommended Funding Source	Prerequisite Document
F	**Traffic Flow Improvements:** **a. Good Samaritan Hospitals Plan** 1. Reconfigure the intersections of Elks Dr. with 9th Street and OR 99W **b. Intersections Capacity Improvements** 1. Close Westbound Conifer Blvd, between 9th Street and OR 99W 2. Add left turn lane to westbound traffic (dual left turn) at 9th and Walnut 3. Add southbound right turn lane at OR 99W and Walnut 4. Add eastbound second left turn lane at OR 99W and Conifer 5. Lengthen southbound left turn at OR 99W and Walnut 6. Add westbound righty turn lane at OR 99W and Walnut *** 7. Add westbound right turn lane at 9th and Circle 8. Add northbound right-turn lane at 9th and Circle 9. Add southbound right turn lane at 9th and Circle 10. Add right turn overlap phase to southbound and northbound at 9th and Circle 11. Lengthen northbound left turn lane to 260 ft. at 9th and Circle 12. Add right turn overlap phase to eastbound approach at OR 99W and Circle 13. Lengthen westbound left turn to 270 ft. at OR 99W and Circle 14. Add southbound and northbound right turn lane at OR 99W and Circle 15. Add one lane to westbound left turn lane (dual left) at OR 99W and Circle 16. Add westbound right turn lane at OR 99W and Circle **c. Coordination of Traffic Signals**	Improvements warranted by the Good Samaritan Hospital's Plan are contingent upon the consensus of ODOT, City of Corvallis and the Hospital and will be financed mainly by the Hospital. Intersection capacity improvement projects will be implemented incrementally. These could be financed by STP, SDC or by the developers CSF/SDC	TIP-CIP

No	Recommendation	Recommended Funding Source	Prerequisite Document
G	**Signs and Hanging Wires Improvements** 1. Strictly enforce the city's sign ordinance 2. Seek opportunities to minimize visual impacts of hanging wires	Admin costs/Grant Opportunities/Other	City Land Development Code
H	**Land Use Improvements** Follow the latest requirements of Land Development Code	Admin costs/Developers	City Land Development Code

Implementation Costs
The following is an estimation of the cost of implementing the recommendations of the Plan based on the best information available:

A. Walking Improvements

1. **Widen substandard sidewalks to 5 ft.** This improvement requires the restructuring of the entire sidewalk. Also a thicker layer of concrete is required where the sidewalk intercepts a driveway. The cost of this improvement is estimated at $4,000 per 100 feet of sidewalk.

2. **Provide for safe pedestrian crossings at 5 identified locations.** The cost of a full pedestrian crossing (traffic signal, a refuge island and markings) is approximately $60,000. Total costs 5 x $60,000 = $300,000.

3. **Evaluate the location of the existing crossing signal near Polk Avenue.** The evaluation will cost approximately $5,000 for the Engineering Division of the City of Corvallis.

B. Bicycling Improvements

1. **Widen substandard bikeways to 6 ft.** In most cases this expansion will require moving the curb, planter strip and the sidewalk. The average cost of this work is estimated at $15,000 per 100 ft. of bike lane expansion.

2. **Add bike lanes on Grant Avenue.** This addition requires restriping of Grant Avenue and the removal of on-street parking. The cost is estimated at $1,000.

3. **Monitor the presence of debris on bike lanes.** There will not be any additional cost to the City for monitoring bike lanes.

C. Transit Improvements

1. **Increase the number of bus shelters for bus stops**. The cost of a bus shelter is $10,000.

2. **Provide pedestrian crossings per Section A above.** See the cost of implementing recommendation A2.

D. Landscaping Improvements

1. **Encourage businesses to plant appropriate type of trees.** There is no cost to the City for the implementing this recommendation. However, there will be a cost to the business/property owners.

2. **Adhere to the 12 ft. planter strip standard, per the CLDC.** There is no cost to the City for implementing this recommendation. However, there will be a cost to the business/property owners.

3. **Enforce the maintenance of planter strip, per the City Ordinance.** There is no cost to the City for implementing this recommendation. However, there will be a cost to the business/property owners.

E. Access Management

1. **Reduce the number of driveways.** There is no cost to the City for implementing this recommendation. However, there will be a cost to the developer, as this recommendation would be implemented upon development/redevelopment of the area.

2. **Require channelization of driveways (right-in-right-out).** There is no cost to the City for implementing this recommendation. However, there will be a cost to the developer, as this recommendation would be implemented upon development/redevelopment of the area.

F. Traffic Flow Improvements

a. Good Samaritan Hospital Plan

1. **Reconfigure the intersections of Elks Dr. with 9th Street and OR 99W.** This cost will be absorbed by the developer.

b. Intersection Capacity Improvement

1. **Close Westbound Conifer Blvd, between 9th Street and OR 99W.** Cost = $20,000.

2. **Add left turn lane to westbound traffic (dual left turn) at 9th Street and Walnut Blvd.** Cost = $50,000.

3. **Add southbound right turn lane at OR 99W and Walnut Blvd.** Cost = $150,000.

4. **Add eastbound second left turn lane at OR 99W and Conifer Blvd.** Cost = $20,000

5. **Lengthen southbound left turn at OR 99W and Walnut Blvd.** Cost = $5,000.

6. **Add westbound right turn lane at OR 99W and Walnut Blvd.** Costly items are the presence railroad tracks, sidewalks and signals. Cost = $500,000.

7. **Add westbound right turn lane at 9th and Circle Blvd.** Addition will require additional right of way.
   Right of way cost = $200,000
   Lane construction = $150,000
   Total = $350,000

8. **Add northbound right-turn lane at 9th and Circle Blvd.** Addition will require additional right of way.
   Right of way cost = $200,000
   Lane construction = $150,000
   Total = $350,000

9. **Add southbound right turn lane at 9th and Circle Blvd.** Addition will require additional right of way.
   Right of way cost = $200,000
   Lane construction = $150,000
   Total = $350,000

10. **Add right turn overlap phase to southbound and northbound at 9th and Circle Blvd.** Cost = $4,000.

11. **Lengthen northbound left turn lane to 260 ft. at 9th and Circle Blvd.** Cost = $250,000.

12. **Add right turn overlap phase to eastbound approach at OR 99W and Circle Blvd.** Cost = $2,000.

13. **Lengthen westbound left turn to 270 ft. at OR 99W and Circle Blvd.** This is a striping project. Cost = $5,000.

14. **Add southbound and northbound right turn lane at OR 99W and Circle Blvd.** Cost/lane = $750,000. Total Costs = $750,000 x 2 = $1,500,000.

15. **Add one lane to westbound right turn lane at OR 99W and Circle Blvd.** Cost = $750,000.

16. **Add westbound right turn lane at OR 99W and Circle Blvd.** Cost/lane = $750,000. Total Costs = $750,000 x 2 = $1,500,000.

G. Signals and Hanging Wires Improvements

1. **Strictly enforce the city's sign ordinance.** Cost $5,000/year.

2. **Seek opportunities to minimize visual impacts of hanging wires.** The implementation of this recommendation will not pose any new cost to the City.

H. Land Use Improvements

1. **Follow the latest requirement of Land Development Code.** The implementation of this recommendation will not pose any new cost to the City.

Chapter VIII
Consistency with the Land Development Code

The City of Corvallis Community Development, Planning Division performed a comparative analysis of the recommendations of the 9th Street Improvement Plan with the City of Corvallis Land Development Code to determine if any language modification is warranted to be made to either of the documents for consistency. This analysis concluded that the recommendations of the 9th Street Improvement Plan is consistent with the Land Development Code and no Land Development Code text amendment is necessary to implement the recommendations of the Plan.

See the City of Corvallis Community Development Letter in the beginning of this document.

Glossary of Acronyms

AASHTO	Association of American State Highway and Transportation Officials
ADT	Average Daily Traffic
BPAC	Bicycle and Pedestrian Advisory Commission (City of Corvallis)
CAMPO	Corvallis Area Metropolitan Planning Organization
CAMTP	Corvallis Area Metropolitan Transportation Plan: Destination 2030
CIP	Capital Improvement Program
CLDC	Corvallis Land Development Code
CSF	Corvallis Street Fund
CTS	Corvallis Transit System
DLCD	Department of Land Conservation and Development
FTA	Federal Transit Administration
GIS	Geographic Information Systems
ITE	Institute of Traffic Engineers
LOS	Level of Service
MPO	Metropolitan Planning Organization
MUCS	Mixed-use community shopping zone (Corvallis Development Code)
N-C Minor	Minor Neighborhood Center (Corvallis Development Code)
N-C Major	Major Neighborhood Center (Corvallis Development Code)
OAR	Oregon Administrative Rule
OBPP	Oregon Bicycle and Pedestrian Plan
OCWCOG	Oregon Cascades West Council of Governments
ODOT	Oregon Department of Transportation
OED	Oregon Employment Department
OSU	Oregon State University
P-AO	Professional and Administrative Office zone
PAC	Project Advisory Committee
PM Peak	The most congested period of traffic during afternoon hours
PSU	Portland State University
R-A-G traffic signal	Red-Amber-Green traffic signal
RTP	Regional Transportation Plan (MPO's Transportation Plan)
SDC	System Development Charges
STP	Surface Transportation Program
TIP	Transportation Improvement Program
TAZ	Traffic Analysis Zone
TE	Transportation Enhancement Program
TGM	Transportation and Growth Management
TWLT	Two-way left-turn (lane)
V/C Ratio	Ratio of Volume to Capacity