

DKS Associates



1400 SW 5th Avenue
Suite 500
Portland, OR 97201
Phone: 503-243-3500

Interstate 84 Troutdale Interchange Area Management Plan

**Interstate 84 (Exit 17)
Troutdale, Oregon**

May 2011

Study Participants

Oregon Department of Transportation

Andrew Johnson, ODOT, Major Projects Manager
Todd Juhasz, ODOT, Senior Major Projects Planner
Simon Eng, ODOT, Senior Traffic Analyst
John Wolf, ODOT, Senior Roadway Designer

City of Troutdale

Rich Faith, Community Development Director
Charlie Warren, Public Works Director
Christine Amedzake, GIS Analyst

Port of Portland

Diane Perry, Senior Project Manager
Phil Healy, Senior Transportation Planner

DKS Associates

Carl Springer, PE, Project Manager
Julie Sosnovske, PE, Project Engineer
Kevin Chewuk, Project Planner
Lisa Diercksen, Project Engineering Assistant
Danella Whitt, Graphics

CH2M Hill

Brandy Steffen, Public Involvement Specialist

Angelo Planning Group

DJ Heffernan, AICP
Katie Prew, AICP

Contents

Study Participants.....	2
Oregon Department of Transportation.....	2
City of Troutdale.....	2
Port of Portland.....	2
DKS Associates	2
CH2M Hill	2
Angelo Planning Group	2
Executive Summary	7
Background	7
Problem Statement.....	8
Plan Development.....	8
Plan Actions	9
Physical Improvements	9
Access Management.....	9
Introduction.....	10
Purpose and Intent	10
Problem Statement.....	10
IAMP Goals and Objectives.....	13
Existing Conditions.....	14
Existing Land Use	14
Existing Local Circulation.....	15
Existing Traffic Operations	17
Future Conditions	17
Future Land Use/Modeling Assumptions	17
Future 2035 No Build Traffic Operational Performance	20
Alternatives Analysis	22
Interchange Area Management Plan (IAMP).....	23
Future 2035 IAMP Operational Performance	23
Planned Facility	26
Interchange Function	26
Circulation and Access Management Plan	27
Access Management/Local Connectivity Plans	27
General Access Management Plan	28
Adoption and Implementation.....	30
ODOT/State of Oregon Implementing Actions.....	30

City of Troutdale Implementing Actions	30
IAMP Adoption	31
Monitoring and Updates	32
Appendix A:Public Involvement	A
Appendix B:IAMP Boundaries, Goals & Objectives, and Evaluation Criteria	B
Goals and Objectives.....	D
Consistency with Goals and Objectives.....	E
Appendix C:Existing Conditions	G
Appendix D:South Frontage Road Access Study	H
Appendix E:Transportation Improvement Investment Study	I
Appendix F:Findings of Compliance	J
Appendix G:ODOT Adoptions	K
Appendix H:City of Troutdale Final Ordinances	L

List of Tables

Table 2: Potential future JTA Funded Project List of 257th Avenue Interchange Improvements	12
Table 3: Land Use within the I-84 257 th Avenue IAMP Study Area and Management Area	15
Table 4: Existing Operating Conditions during Peak Hours	19
Table 5: Assumed Household and Employment Quantities within IAMP Study Area	19
Table 6: 2035 No Build Design Hour Intersection Operations (AM/PM Peak Hours).....	20
Table 7: Future PM Peak Hour 2035 (Preferred Alternative 6) Intersection Performance	25
Table B-1: How IAMP Goals and Objectives are Addressed by the IAMP	E

List of Figures

Figure 1: Project Study/Management Areas	11
Figure 2: Approximate Driveway Locations Compared to Adopted Guidelines.....	16
Figure 3: Existing Bicycle and Pedestrian Facilities in the Interchange Management Area	18
Figure 4: Transportation Improvements Map	24
Figure 5: Interchange Management Area Approximate Existing Access Locations and Desired Access Spacing	29

Glossary of Terms

CIA	Cooperative Improvement Agreement
HCM	Highway Capacity Manual
HDM	Highway Design Manual
IAMP	Interchange Area Management Plan
LOS	Level of Service
MOU	Memorandum of Understanding
OAR	Oregon Administrative Rule
ODOT	Oregon Department of Transportation
OHP	Oregon Highway Plan
ORS	Oregon Revised Statutes
OTC	Oregon Transportation Commission
PAC	Project Advisory Committee
PMT	Project Management Team
TPR	Transportation Planning Rule
TSP	Transportation Systems Plan
TRIP	Troutdale Reynolds Industrial Park
UGB	Urban Growth Boundary
V/C	Volume-to-Capacity Ratio



Executive Summary

This Interchange Area Management Plan (IAMP) presents how the City of Troutdale and ODOT will improve the Interstate 84 (Exit 17) interchange to serve planned growth. The IAMP describes the extent of operational and access management solutions that are recommended, and the steps needed to implement the various improvements.

Background

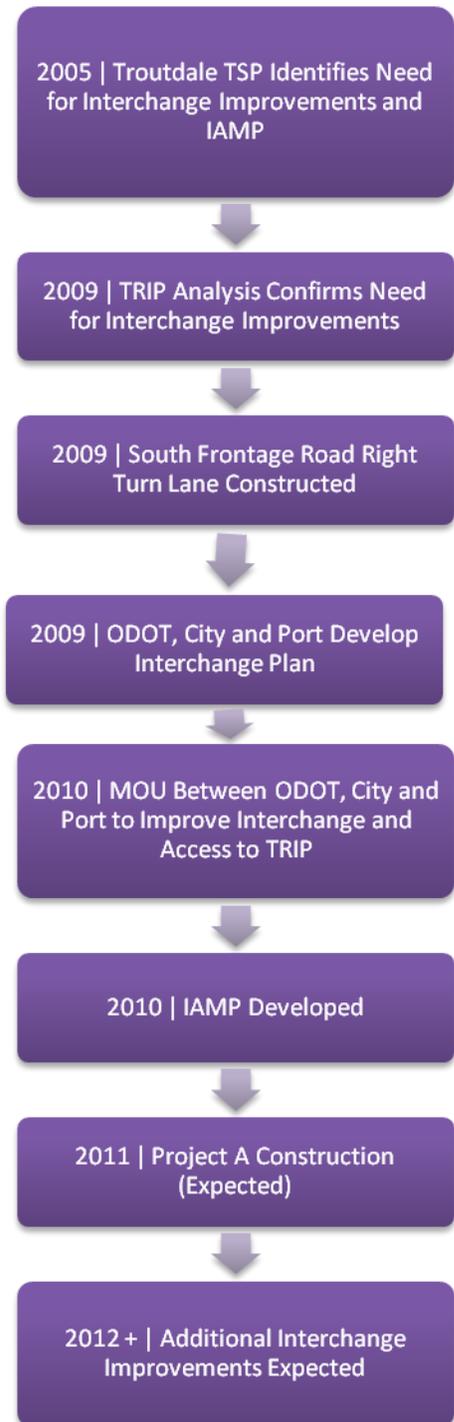
In 2005, The City of Troutdale adopted an update to its Transportation System Plan (TSP) that identified the need for improvements in the vicinity of the I-84 Troutdale Interchange as well as the need for an Interchange Area Management Plan (IAMP).

In 2009, traffic studies conducted for the Troutdale Reynolds Industrial Park (TRIP) development confirmed the need for improvements at the interchange in order to accommodate development associated with the Industrial Park.

Also that year, a project funded by ODOT, Port of Portland, City of Troutdale and federal stimulus funds added an additional eastbound to southbound right turn lane for traffic headed east on South Frontage Road to 257th Avenue. The project was completed in December, 2009.

Also in 2009, the State Legislature passed the Jobs and Transportation Act which allocated \$24 million to improve the interchange. ODOT, the City of Troutdale and Port of Portland developed a plan to improve the interchange. The plan was memorialized in a Memorandum of Understanding to obtain funding for the I-84 Troutdale interchange to improve safety in the vicinity of the interchange and improve freight access between I-84 and the industrial lands to the north of the interchange. The Memorandum of Understanding further states that the partners (ODOT, City of Troutdale and Port of Portland) participate jointly in planning refinement, the environmental permitting process, as well as construction oversight for the Project improvements identified, including an Interchange Area Management Plan (IAMP) for any significant improvements at the interchange.

The plan included the following elements:



1. Project A - Widening the eastbound off-ramp at the interchange to accommodate additional turn lanes and additional storage, and adding a third through lane to South Frontage Road. Adding intersection improvements at the northeast quadrant of the interchange to improve operations at the ramp terminal and provide storage
2. Project B - Widening the Marine Drive under crossing to five lanes for two-way traffic and improve vertical clearance, as well as improving the intersection in the NW quadrant of the interchange to improve operations and add storage

This IAMP assumes that improvements identified as “Project A” will be constructed in the near term (currently planned for 2011) and considers whether “Project B” improvements should be the next to be constructed should more funding become available.

The major objectives and outcomes of an IAMP include:

- The IAMP must be adopted by the City of Troutdale and the Oregon Transportation Commission before construction of the Project B interchange area improvements can begin.
- The IAMP must identify opportunities to improve operations and safety and adopt strategies and development standards to capture those opportunities.
- Short, medium and long-range actions must be developed to improve operations and safety in the interchange area.
- The City’s Comprehensive Plan land use assumptions must be considered in the IAMP, and
- The IAMP must be consistent with any locally adopted plan, especially the City’s Comprehensive Plan and Transportation System Plan as well as ODOT’s 1999 Oregon Highway Plan.

Problem Statement

Recent traffic studies have shown that the I-84 Troutdale interchange is approaching capacity. Recurring safety issues at the eastbound exit ramp at Exit 17 have been observed during evening peak hours, as vehicle queues have been reported to back up onto the mainline freeway during this period. This condition is caused by a lack of capacity and storage at the I-84 Troutdale Eastbound exit ramp terminal, as well as operational issues along South Frontage Road. These issues include conflicts between truck and auto traffic at business accesses along South Frontage Road.

Plan Development

The IAMP was developed based on the City of Troutdale’s Comprehensive Plan land use assumptions, with specific detail assumed for the Troutdale Reynolds Industrial Park area. Some of the land within the IAMP Management Area (illustrated in Figure 1) is already fully developed. Of the undeveloped lands within the Management Area, the areas that have the most potential to significantly impact the interchange are the undeveloped commercial land south of South Frontage Road and the undeveloped General and Light Industrial properties north of North Frontage Road adjacent to the Troutdale Airport. Additionally, the Troutdale Reynolds Industrial Park (TRIP) is located outside the Management Area, but within the IAMP Study Area, and is likely to contribute a significant amount of traffic to the interchange. All of these areas were fully accounted for in the trip generation assumed in developing the 2035 traffic volumes in the IAMP.

The I-84 Troutdale IAMP document consists of two major sections: the IAMP and the supporting technical appendices. The plan includes the IAMP purpose and objectives, a function statement, physical improvements, access management plans and the process used to implement, monitor and update the IAMP.

The appendices include the technical analysis performed to develop the IAMP, a summary of the public involvement process and findings of compliance.

Plan Actions

The IAMP calls for actions in three key areas: physical improvements, access management and implementation.

Physical Improvements

This action includes construction of the physical improvements required for the interchange to operate under acceptable standards through the year 2035. These improvements include the planned enhancement of the interchange, including the Project A improvements currently being designed and constructed by ODOT, along with additional improvements identified in this IAMP to provide for a functioning interchange into the future.

Access Management

A key plan element was developed to help protect capacity in the interchange once the physical improvements are constructed. An access management plan identifies key long-term (upon development or redevelopment) actions for improving access control in the vicinity of the interchange. This plan will help protect capacity in the interchange.

Introduction

The I-84/257th Interchange Area Management Plan (IAMP) has been prepared to implement plans and strategies for the planned reconstruction of an existing interchange on Interstate 84 at 257th Avenue. “Project A” improvements to the interchange will upgrade key elements, including ramp widening, widening on both South Frontage Road and North Frontage Road and improvements to the Graham Road/North Frontage Road intersection. Figure 1 shows the project area.

Purpose and Intent

An IAMP is required for any new or significantly reconstructed interchange by OAR 734-051-0155(6). More importantly, the purpose of an IAMP is to protect the function of the interchange and, consequently, the state’s and local agency’s investment in the facility. New interchanges and improvements to existing interchanges are very costly. State and local government and their citizens have an interest in ensuring that their interchanges function efficiently. Engineering design work is underway for the next phase of improvements to the I-84/257th interchange and this IAMP is being conducted to ensure that the ultimate design will effectively reflect the needs of the interchange for at least the next 25 years.

Problem Statement

The I-84 257th Avenue (Exit 17) interchange has experienced congestion at several of its intersections and the eastbound off-ramp regularly backs up onto I-84 resulting in rear end collisions. Over the years, a number of improvements have been identified, some of which have been recently constructed and others for which funding is currently available or will be available in the near future. Funds have been allocated through the Governor’s Jobs and Transportation Act (JTA) in 2009 to construct projects within the interchange area to support job growth and economic development in this area.

The Oregon Department of Transportation (ODOT), City of Troutdale and the Port of Portland have outlined a series of specific improvement projects that will address existing safety and mobility needs identified in past planning studies, as well as provide capacity enhancement to serve economic growth in the area.

In 2005, the City of Troutdale adopted an update to its Transportation System Plan (TSP). This TSP identified the need for improvements in the vicinity of the I-84/257th Avenue interchange as well as the need for an Interchange Area Management Plan (IAMP). Additionally, recent traffic studies associated with the Troutdale Reynolds Industrial Park (TRIP) have shown that the I-84 257th Avenue interchange will not meet performance standards in the future with development of the Industrial Park.

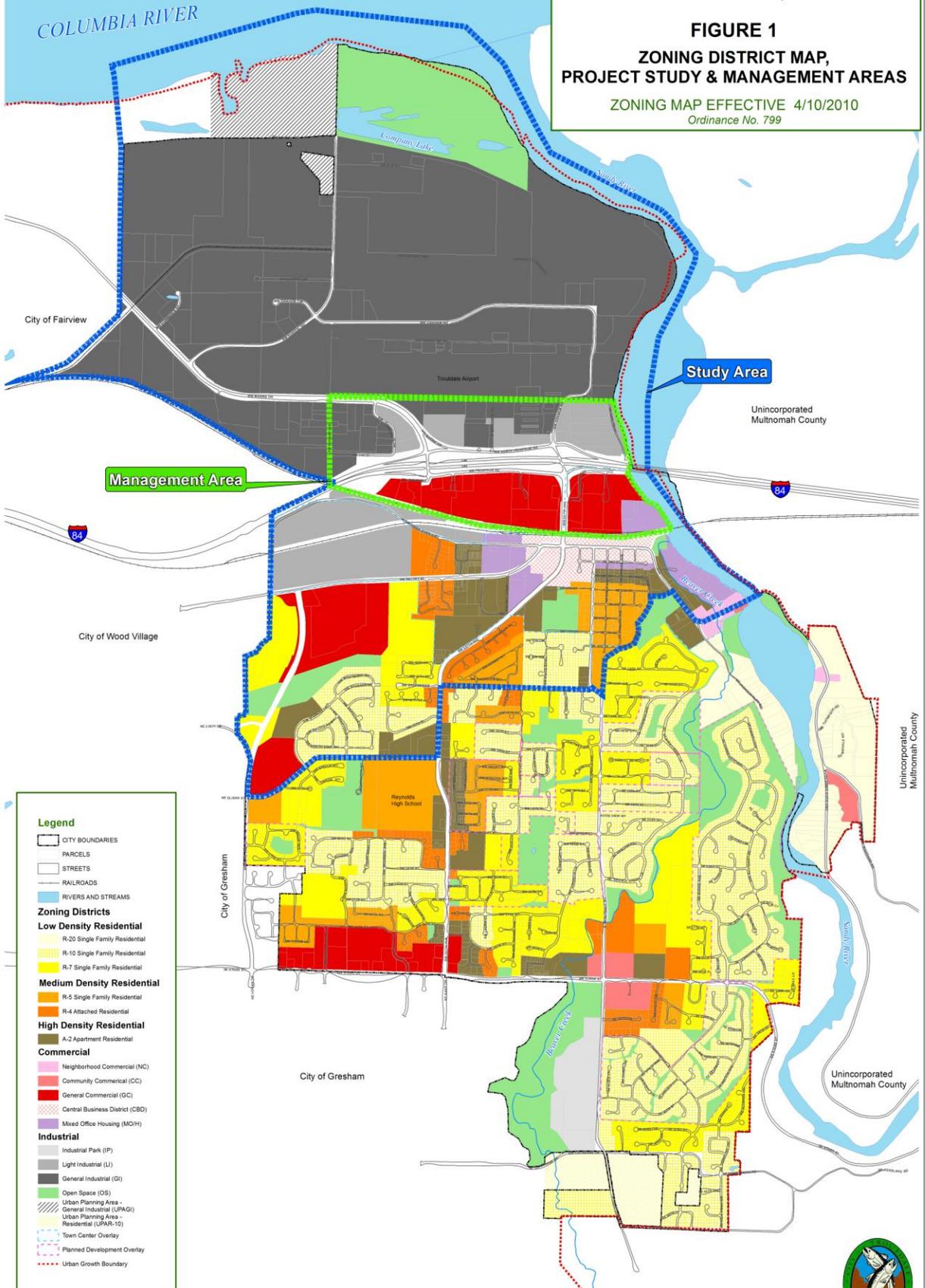
Based on the preceding analysis, a series of interchange improvements have been constructed, or are planned. In fall of 2009, ODOT partnered with the Port of Portland and City of Troutdale to complete construction on widening the South Frontage Road at Graham Road to include a second dedicated eastbound right turn lane.

JTA funded interchange improvements are in the design process and planned for construction in summer 2011 (see Table 1 for details).



DEPARTMENT OF COMMUNITY DEVELOPMENT
CITY OF TROUTDALE
 MULTNOMAH COUNTY, OREGON

FIGURE 1
ZONING DISTRICT MAP,
PROJECT STUDY & MANAGEMENT AREAS
 ZONING MAP EFFECTIVE 4/10/2010
 Ordinance No. 799



Management Area

Study Area

Legend

- CITY BOUNDARIES
- PARCELS
- STREETS
- RAILROADS
- RIVERS AND STREAMS
- Zoning Districts**
- Low Density Residential**
- R-20 Single Family Residential
- R-10 Single Family Residential
- R-7 Single Family Residential
- Medium Density Residential**
- R-5 Single Family Residential
- R-4 Attached Residential
- High Density Residential**
- A-2 Apartment Residential
- Commercial**
- Neighborhood Commercial (NC)
- Community Commercial (CC)
- General Commercial (GC)
- Central Business District (CBD)
- Mixed Office Housing (MO/H)
- Industrial**
- Industrial Park (IP)
- Light Industrial (LI)
- General Industrial (GI)
- Open Space (OS)
- Urban Planning Area - General Industrial (UPA/GI)
- Urban Planning Area - Residential (UPAR-10)
- Town Center Overlay
- Planned Development Overlay
- Urban Growth Boundary

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. The City of Troutdale provides this data in good faith and shall not be liable for any incorrect results, and lost profits, and special, indirect, or consequential damages to any party arising out of or in connection with the use or the inability to use the data herein or the services provided. The City of Troutdale provides this data and services as a convenience to the public. Furthermore, the City of Troutdale reserves the right to change or revise published data and/or these services at any time.

Map prepared by:
 The City of Troutdale Design Works
 200 2nd Street
 Troutdale, Oregon 97130
 Map data compiled from:
 Metro Regional Government Agency and
 Multnomah County in collaboration with
 The City of Troutdale

Map updated by:
 CA
 4/10/2010
 Map released by:
 Zoning

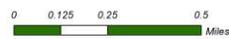


Table 1: Current JTA Funded Project List of 257th Avenue Interchange Improvements

Location	Description
I-84 Eastbound off-ramp	Add third lane approach to ramp terminal to increase vehicle queue space.
South Frontage Road	Add third eastbound lane between Marine Drive and Graham Road
North Frontage Road	Add third westbound lane from Graham Road to Marine Drive. The third lane will become a right-turn only lane onto Marine Drive
Graham Road / North Frontage Road	Construct 2 nd northbound left turn lane Add westbound right-turn lane Add southbound free flow right-turn lane which merges into new 3 rd westbound lane
Various Intersections	Traffic signal upgrades

These improvements are needed because the I-84 eastbound off-ramp at Marine Drive is likely to back up onto the mainline freeway in the future, which is a serious safety concern. South Frontage Road is congested during morning and evening peak periods and heavy truck traffic further exacerbates the congestion. The intersection at Graham Road/North Frontage Road experiences a significant amount of congestion, particularly during the AM peak period. This congestion is due, in part, to vehicles heading northbound from Troutdale to westbound I-84 toward Portland conflicting with vehicles coming from the east on I-84 into Troutdale. This intersection will be further impacted as TRIP develops.

If additional JTA funding is available, ODOT, the City of Troutdale and the Port of Portland will work together to determine the best use of the funding. Potential future improvements are summarized in Table 2.

Table 2: Potential future JTA Funded Project List of 257th Avenue Interchange Improvements

Location	Description
Marine Drive	Extend south of the South Frontage Road, looping east to form a bypass road to the commercial uses and connect to Graham Road at 257 th Way (opposite the Outlet Mall)
I-84 Underpass at Marine Drive	Reconstruct underpass between the North Frontage Road and South Frontage Road to allow for standard vertical and horizontal clearance, and provide two additional travel lanes. This construction would allow for two-way circulation as identified in the Troutdale TSP. Provide northbound left-turn lane, two northbound through lanes
I-84 Eastbound Off-Ramp / Marine Drive	Widen I-84 Eastbound Off-Ramp to provide an eastbound left-turn lane onto Marine Drive Widen approach to provide an additional eastbound through lane

IAMP Goals and Objectives

The goals and objectives of the I-84 Troutdale IAMP should reflect the intentions and interests of ODOT, the City of Troutdale, the Port of Portland, Multnomah County and other key stakeholders for the interchange and transportation operations in the area. The goals and objectives should be guided by, but not re-statements of, OHP policies and OAR language. The objectives need to be concrete statements that relate what the plan is trying to accomplish and should be achievable and measureable. The objectives serve as the basis for data collection and research and as alternative evaluation criteria to guide alternatives analysis and selection of the preferred alternative, and to guide management decisions. The goals developed for this IAMP are listed below and the goals and objectives together are listed in the appendix.

Goal 1: Protect the function and operation of the interchange and the state highway as follows:

I-84 is classified as an Interstate Highway. It is part of the National Highway System and is a designated freight route between Portland and points east. The operational objective for Interstate Highways is to provide safe and efficient high-speed travel in urban and rural areas.

Goal 2: Provide for an adequate system of local roads and streets for access and circulation within the interchange area that minimizes local traffic through the interchange and on the interchange cross roads.

Goal 3: Provide safe and efficient multi-modal travel between the connecting roadways (and the surface street network, if applicable).

Goal 4: Ensure future changes to the planned land use system are consistent with protecting the long-term function of the interchange and the surface street system and the integration of future transportation projects and land use changes.

Goal 5: Recognize the importance of the interchange function to support local and regional economic development goals and plans.

Goal 6: Ensure that the needs of regional through trips and the timeliness of freight movements are considered when developing and implementing the IAMP, in particular when planning for improvements that directly impact freight routes.

Interchange Management Area

Figure 1 illustrates the Interchange Management Area (IMA). The IMA delineates the area around the I-84 Troutdale interchange in which specific IAMP access and management regulations apply to land use decisions. The IMA includes those properties that currently have or are expected to have the greatest impact on operations at the interchange.

The management area is defined by tax lot parcel boundaries extending from the railroad tracks just north of the Historic Columbia River Highway to the south, just north of the airport to the north, approximately ½ mile to the west and approximately ½ mile to the east of the interchange ramp terminals.

Figure 1 **Error! Reference source not found.** also illustrates the project Study Area. The Study Area extends from the Columbia River to the north, the Sandy River to the east, the Troutdale City Limits line to the west and Cherry Park Road to the south. The traffic analysis for the IAMP assumed development of much of the undeveloped land within the Study Area (more detail in Future Conditions memorandum in the appendix).

Existing Conditions

Existing Land Use

The selected geographic boundaries for the IAMP study area include the Columbia River to the north, the Sandy River to the east, City Limits to the west, and Cherry Park Avenue/Sandy Avenue/Historic Columbia River Highway to the south. The study area and proposed management area are both illustrated in the appendix, which shows all existing streets and property zoning within the study area boundaries. The City's Comprehensive Plan is also shown in the appendix.

Within the study area, most lands are zoned for commercial, residential or industrial uses. The commercial lands tend to be located in the middle of the study area, near the interchange with residential lands adjacent to the south. Industrial land is located primarily on the north end of the study area, north of the interchange.

Table 3 provides total acreages for each zone type and identifies lands currently undeveloped. All of the land within the IAMP management area is zoned for industrial and commercial uses, while none of the land is zoned for residential use. A substantial portion of the land in both the Management Area and Study Area is currently vacant (24% and 50%, respectively).

Table 3: Land Use within the I-84 257th Avenue IAMP Study Area and Management Area

Land Use	Study Area		Management Area	
	Total Acres/ (Vacant)	Percentage/ (Vacant)	Total Acres/ (Vacant)	Percentage/ (Vacant)
Residential	285 (44)	14% (15%)	0 (0)	0% (0%)
Commercial	241 (36)	11% (15%)	107 (18)	39% (17%)
Industrial	1,580 (965)	75% (61%)	167 (48)	61% (29%)
Total	2,106 (1,045)	100% (50%)	274 (66)	100% (24%)

* Table includes parcel data only, areas dedicated to roads and right-of-way are not included

Much of the land within the IAMP Study and Management areas is already fully developed, most of it at its highest and best use. Currently vacant lands are shown in the appendix. Of the undeveloped lands within the IAMP Management Area, the area that has the most potential to significantly impact the interchange is the industrial land to the north (Troutdale Reynolds Industrial Park – TRIP). Trip generation for the TRIP site has been specifically analyzed and its potential impact on the interchange previously determined. Metro works cooperatively with local governments to forecast future population, employment, and land use patterns within the tri-county metropolitan area. Metro’s land use assumptions are summarized in the appendix. The transportation analysis for the IAMP is based on planned land uses; specifically, traffic modeling based on existing zoning (see appendix for more detail).

Existing Local Circulation

Interchange area roadways were examined to identify current access density in comparison to what the City and State access management guidelines recommend. The *City of Troutdale Transportation System Plan* and ODOT’s *1999 Oregon Highway Plan* have adopted access management standards. These standards were applied to evaluate access and intersection spacing for South Frontage Road, Graham Road, North Frontage Road and Marine Drive which are all classified in the City’s TSP as arterials in the vicinity of the intersection, with the exception of Marine Drive and Graham Road north of North Frontage Road, which are classified as a collector and local, respectively. The City’s minimum access spacing on an arterial is 530 feet for roadways and driveways. ODOT’s minimum access spacing standards are 1,320 feet to the first full-access intersection and 750 feet to the first right-in/right-out only access from the ramp terminal.

Figure 2 shows the driveway and intersection spacing for these roadways within the management area and compares them with the adopted guidelines. There are many locations along South Frontage Road as well as locations along Graham Road, North Frontage Road and Marine Drive where desired access spacing is not met. It should be noted that the standards provided by ODOT and the City were not in existence when this area originally developed. More specific detail can be found in the appendix.

Existing Bicycle/Pedestrian Facilities

Figure 3 shows the existing bicycle and pedestrian facilities in the vicinity of the interchange. Generally, there are designated bicycle and pedestrian facilities along the south side of South Frontage Road, both sides of 257th Avenue south of the interchange and along the south side of Marine Drive (there are also bicycle lanes on the north side of Marine Drive, but no sidewalks since the adjacent property is undeveloped). There are also sidewalks on the east side of Graham Road north of the interchange. A new multi-use path is currently being constructed under the Sandy River Bridge, connecting the south and north sides of the interchange. Other than these facilities, designated sidewalks and bicycle lanes are generally lacking in the interchange area.

Existing Traffic Operations

The existing traffic operating conditions at the study intersections were determined for the PM peak hour based on the *2000 Highway Capacity Manual* methodology¹. The conditions include the estimated average delay, level of service (LOS), and volume-to-capacity (V/C) ratio of each study intersection and are listed in Table 4. All study intersections currently comply with the City of Troutdale, Multnomah County LOS D operating standard, as well as with ODOT's volume to capacity standards.

The AM peak hour operations were previously analyzed as part of the Troutdale Reynolds Industrial Park (TRIP) transportation studies. These results have been reproduced in Table 4 below. Note that the conditions are similar between the two peak periods, although the PM peak period generally has higher delays than does the AM peak period.

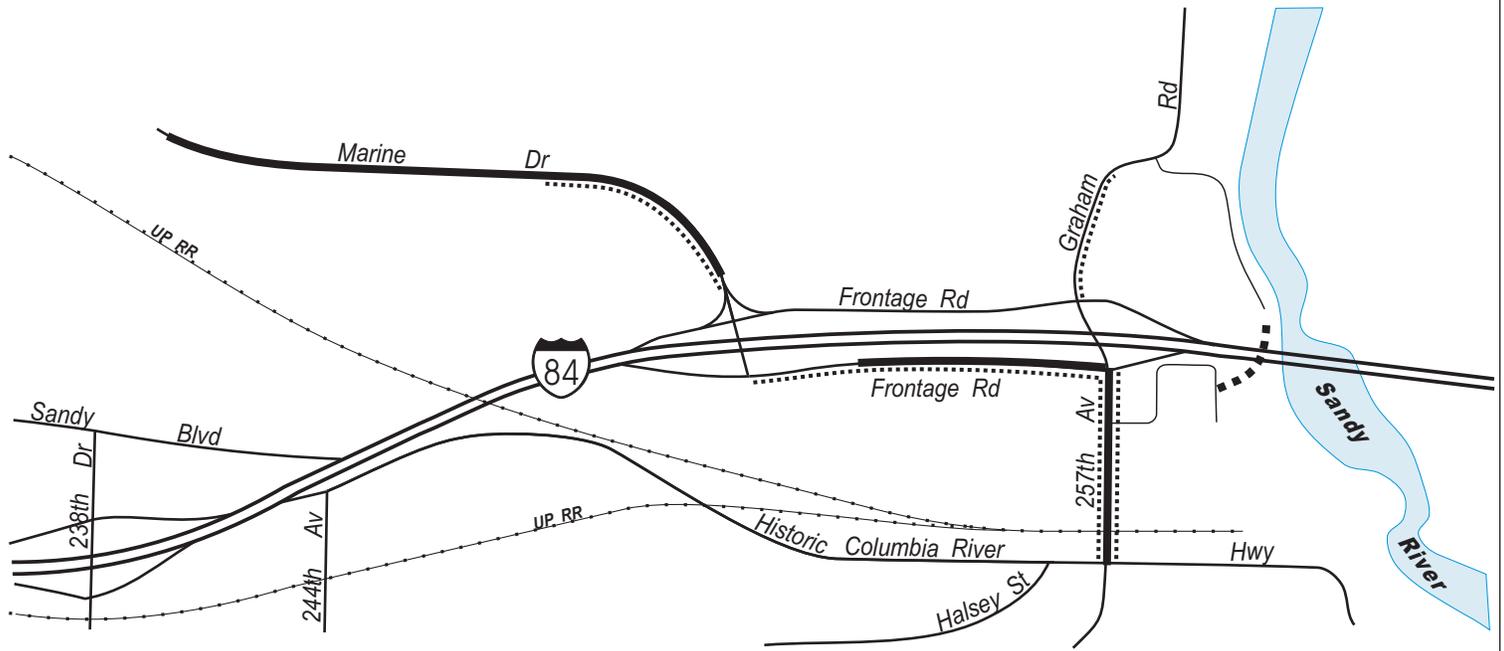
Future Conditions

Future Land Use/Modeling Assumptions

The appendix contains a description of the model assumptions that were used and the refinement that was undertaken to generate future 2035 traffic volumes as well as a figure showing the base (2005) and future (2035) street networks that were assumed in the model. Table 5 summarizes the household and employment growth assumptions that were used in the model.

The future analysis generally assumes that land within the Study Area will develop according to the City's Comprehensive Plan and has been adjusted to account for several known development projects that are currently in process. In particular, traffic from the planned Troutdale Reynolds Industrial Park (TRIP) site, located north of the interchange, has been specifically addressed. The analysis assumed development likely to occur by 2035 throughout the City of Troutdale as well as in the greater Metro area (see appendix for further discussion of the land use assumed).

¹*2000 Highway Capacity Manual*, Transportation Research Board, 2003.



LEGEND

-  - On-Street Bicycle Lanes
-  - Sidewalks
-  - Multi-Use Path (Under Construction)

DKS Associates
TRANSPORTATION SOLUTIONS



NO SCALE

Figure 3

EXISTING BICYCLE & PEDESTRIAN FACILITIES

Table 4: Existing Operating Conditions during Peak Hours

Intersection	Minimum Operating Standard (City, ODOT)	Peak Hour	Operating Conditions		
			Average Stopped Delay per vehicle	Level of Service	Volume-to-Capacity Ratio
Traffic Signal Controls					
Marine Drive/ Sundial Road	LOS D	AM	9.3	A	0.52
		PM	9.6	A	0.43
I-84 WB On-Ramp/ Marine Drive	LOS D, 0.85 V/C	AM	9.3	A	0.54
		PM	15.8	B	0.51
I-84 EB Off-Ramp /Marine Drive	LOS D, 0.85 V/C	AM	8.1	A	0.28
		PM	30.3	C	0.60
I-84 EB On-Ramp/ Graham Road	LOS D, 0.85 V/C	AM	12.6	B	0.61
		PM	10.6	B	0.61
I-84 WB Off-Ramp/ Graham Road	LOS D, 0.85 V/C	AM	11.8	B	0.60
		PM	29.6	C	0.37
Graham Road/ 257 th Way	LOS D	AM	4.5	A	0.52
		PM	12.3	B	0.55
257 th Drive/ Historic Columbia River Hwy	LOS D	AM	22.7	C	0.49
		PM	28.0	C	0.70
STOP Sign Controls				Major / Minor	
Graham Road/ Sundial Road	LOS D	AM		A/A	
		PM		A/A	

Table 5: Assumed Household and Employment Quantities within IAMP Study Area

	Households	Retail Employees*	Service Employees*	Other Employees*	Total Employees*
Base Year 2005	1,750	1,763	322	1,842	3,927
Future Year 2035	2,842	3,176	1,378	4,694	9,248
Growth (2005 – 2035)	+1,092	+1,413	+1,056	+2,852	+5,321

*Note that these quantities represent Metro’s forecasts for the IAMP Study Area – employment and trip generation forecasts for the Troutdale Reynolds Industrial Park (TRIP) were accounted for separately, since specific detail was available for that area (discussed below).

The base year 2005 and future year 2035 model scenarios included different street networks, with the base year network closely resembling the existing transportation system and the future year network reflecting conditions planned to exist according to the Regional Transportation Plan. A side-by-side comparison of the networks associated with these scenarios is shown in the appendix. The City of Troutdale’s Capital

Improvements Plan and Multnomah County’s Transportation Capital Improvement Plan and Program are generally consistent with the RTP. Lists of relevant projects in each of these plans are shown in the appendix.

Future 2035 No Build Traffic Operational Performance

Study intersections within the IAMP area were analyzed through the use of the Synchro model that was used to examine existing conditions, updated with the traffic volume and roadway geometry data shown in the appendix. From this analysis, intersection levels of service and volume to capacity ratios were obtained using Highway Capacity Manual² methodologies for signalized intersections for comparison with the applicable jurisdiction’s adopted performance standards. The results of this analysis are shown below in Table 6 and further illustrated in the appendix.

Table 6: 2035 No Build Design Hour Intersection Operations (AM/PM Peak Hours)

Intersection	Minimum Operating Standard (City/County, ODOT)	Peak Hour	Operating Conditions			Minimum Standard Met?
			Delay ¹	Level of Service	Volume-to-Capacity Ratio	
Traffic Signal Control						
<i>ODOT Facilities – Volume-to-Capacity Ratio Determines Performance Standard</i>						
I-84 WB On-Ramp/Marine Drive	0.85 V/C	AM	17.7	B	1.00	No
		PM	44.3	D	>1.0	No
I-84 EB Off-Ramp/Marine Drive	0.85 V/C	AM	14.3	B	0.63	Yes
		PM	48.1	D	0.96	No
I-84 WB Off-Ramp/Graham Road	0.85 V/C	AM	15.5	B	0.98	No
		PM	10.3	B	0.75	Yes
I-84 EB On-Ramp/257 th Avenue	0.85 V/C	AM	68.5	E	>1.0	No
		PM	40.6	D	0.93	No
<i>Multnomah County/City of Troutdale Facilities – Level of Service Determines Performance Standard</i>						
Marine Dr/Sundial Road	LOS D	AM	>80.0	F	>1.0	No
		PM	>80.0	F	>1.0	No
257 th Avenue/257 th Way	LOS D	AM	5.7	A	0.76	Yes
		PM	17.5	B	0.87	Yes
257 th Avenue/Historic Columbia River Highway	LOS D	AM	90.6	F	>1.0	No
		PM	72.0	E	0.97	No

Bold – indicates intersections not meeting performance standard. Delay = Average Stopped Delay per Vehicle

When comparing this table to the comparable Existing Conditions table, it becomes clear that operations at almost all study intersections have substantially declined.

Marine Drive/Sundial Road would operate at an unacceptable level of service assuming forecasted 2035 traffic volumes. Much of the TRIP traffic will travel through this intersection, creating demand at the intersection that is

²Highway Capacity Manual, Transportation Research Board, Washington, D.C., 2000.

expected to exceed capacity during both the AM and PM peak hours. Additional improvements will be required at this intersection to meet City and County LOS standards.

The **I-84 Eastbound Off-Ramp/Marine Drive** intersection would decline substantially during both peak periods. However, during the morning peak period, when the majority of traffic in the interchange is headed west on I-84 away from Troutdale, the intersection would continue to operate acceptably. It would not operate acceptably during the PM peak period. Additional improvements will be necessary for this intersection to meet ODOT's performance standard, which requires a volume-to-capacity ratio of 0.85 or lower.

The **I-84 Westbound Ramps/Marine Drive** intersection would decline substantially during both peak periods and would not operate acceptably during either peak period. A third through lane is assumed on North Frontage Road between Graham Road and Marine Drive, terminating at the west end in a free-right turn onto northbound Marine Drive. Additional improvements will be necessary for this intersection to meet ODOT's performance standard, which requires a volume-to-capacity ratio of 0.85 or lower.

The **I-84 Westbound Ramps/Graham Road/North Frontage Road** intersection improvements include reconfiguration of the northbound approach to include a 50 foot northbound through pocket and two exclusive northbound left turn lanes. A 200 foot westbound right turn pocket on the I-84 westbound off-ramp is also added. The third through lane on North Frontage Road described above would begin at the east end as a free southbound right turn from Graham Road to westbound North Frontage Road. This intersection declines only slightly during the evening peak period, largely because of the improvements planned there. The biggest concern at this intersection is the AM peak hour, when the volume-to-capacity ratio is 0.98, exceeding ODOT's standard.

I-84 Eastbound On-Ramp/257th Avenue/South Frontage Road is expected to decline from LOS B during both the AM and PM peak hours to LOS E during the AM peak hour and LOS D during the PM peak hour. The volume-to-capacity ratio during both peak hours is also expected to exceed capacity during the AM peak and decline to 0.93 during the PM peak. Neither peak period would meet ODOT's level-of-service standard. Additional improvements will either be needed at this intersection, or elsewhere in the street network to redirect traffic away from this intersection.

257th Avenue/257th Way will decline from LOS A to LOS B during the morning peak hour, but will remain at the same level-of-service as existing conditions during the evening peak hour (LOS B). Performance will decline somewhat, but will still be well within City/County standards.

257th Avenue/ Historic Columbia River Highway is expected to decline substantially in the future. Level-of-service will decline from LOS C to LOS F during the AM peak hour and from LOS C to LOS E during the PM peak hour. Additional improvements will be needed at this intersection in order for it to meet City/County level-of-service standards.

Alternatives Analysis

A number of alternatives have been analyzed for the I-84 Troutdale Interchange starting with the 2005 Troutdale Transportation System Plan. A summary of the alternatives considered was prepared for the Policy Advisory Committee for this IAMP and is provided in the appendix under Public Involvement. Additionally, the alternatives specifically considered for this IAMP project are summarized in the appendix under South Frontage Road Access Study and Transportation Improvement Investment Study.

The South Frontage Road Access Study was conducted to developed short term, lower cost alternatives to specifically address access issues along South Frontage Road. The Transportation Improvement Investment Study addresses facility and access issues related to the interchange as a whole (i.e. Interchange Management Area).

Interchange Area Management Plan (IAMP)

This section presents access and land use decisions for maximizing the operational life of the I-84 Troutdale interchange while ensuring that the planned local land use can be supported. It describes the transportation improvements for the interchange and the associated improvements on South Frontage Road and North Frontage Road, identifies access management and policy actions, and reviews the process for state and local authorities to adopt the I-84 Troutdale IAMP. The decisions presented in this section serve as the basis for an agreement between ODOT and the City of Troutdale on the direction and principles that will guide the approval and implementation of the IAMP.

Project stakeholders and other members of the public have provided input on each of the project elements through two public open houses and four project advisory committee meetings. A full description of public involvement activities is included in the appendix.

The top priority for interchange improvements is to provide more direct access between I-84 and the Troutdale Reynolds Industrial Park (TRIP). The more direct and effective route is the 238th Extension that would provide a connection between I-84 and Marine Drive west of The I-84 Troutdale interchange. However, there are many unknowns technically, politically and financially. The Two-Way Marine Drive project has the potential to be constructed sooner and with fewer technical, political and financial risks.

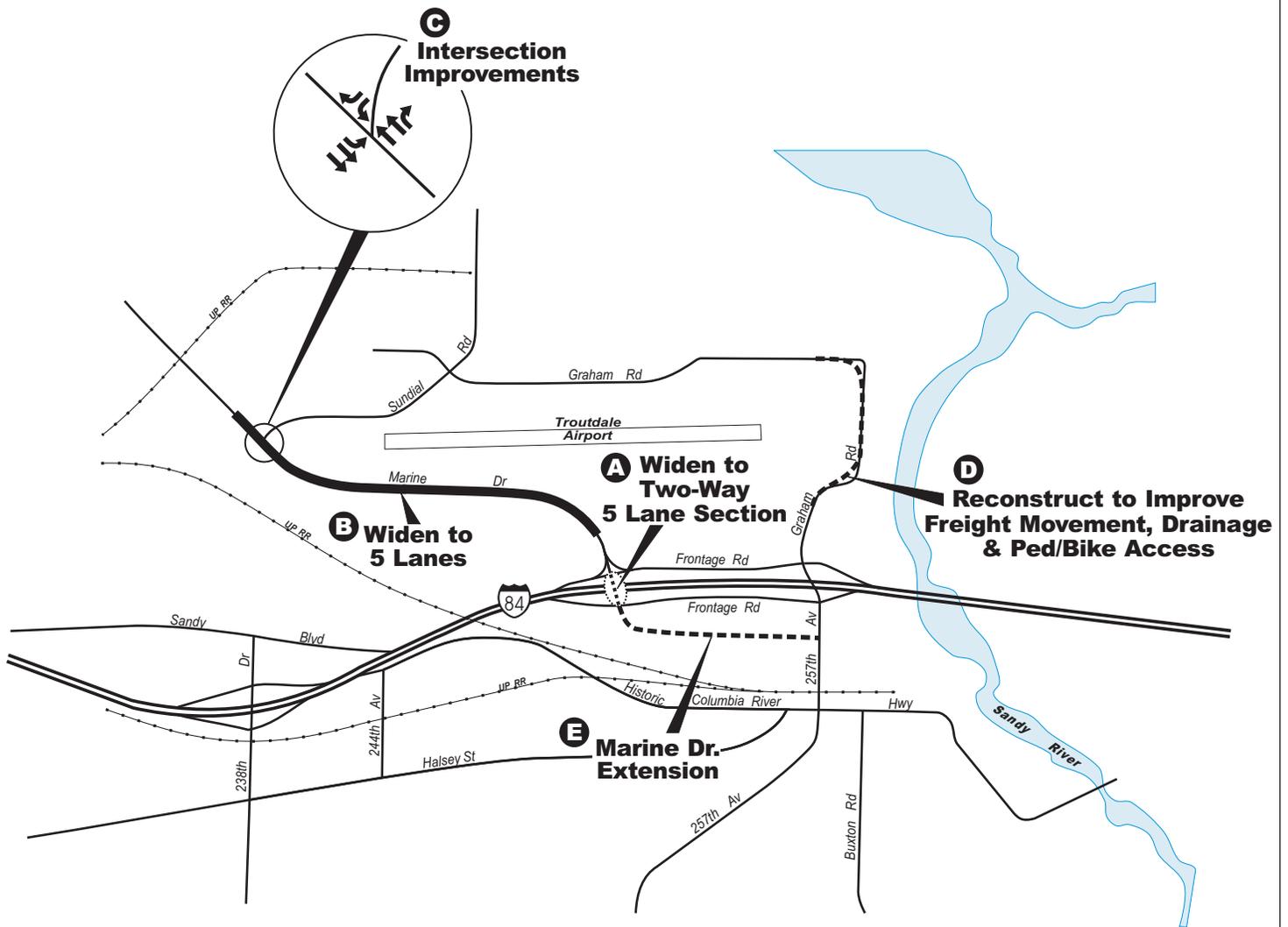
Future 2035 IAMP Operational Performance

Future (2035) traffic conditions were analyzed at the I-84 Troutdale Interchange. Highway Capacity Manual³ (HCM) level-of-service (LOS) and volume-to-capacity (V/C) ratios were used to evaluate the performance of the proposed interchange improvements.⁴ ODOT's Highway Design Manual (HDM) maximum V/C threshold for new improvements on District/Local Interest Roads Inside the Urban Growth Boundary is 0.85⁵. This threshold would apply to the interchange ramp terminals (I-84 Eastbound Ramp/Marine Drive, I-84 Eastbound Ramp/257th Avenue, I-84 Westbound Ramp/Graham Road and I-84 Westbound Ramp/Marine Drive). The remaining study intersections would fall under the City of Troutdale or Multnomah County's jurisdiction and would be required to operate at LOS "D" or better. **Error! Reference source not found.** summarizes 2035 PM peak hour intersection performance with recommended IAMP improvements in place. The recommended improvements are shown in Table 7, with more specific detail available in the Transportation Improvement Investment Study Memorandum in the appendix.

³*Highway Capacity Manual*, Transportation Research Board, Washington, D. C., 2000.

⁴ For "no-build" conditions, the *Oregon Highway Plan* volume-to-capacity ratio applies for planning purposes (0.85 or 0.90 for the ramp terminals in this case). However, since that threshold was not met (see appendix), a "build" condition is required, at which point the *Highway Design Manual* volume-to-capacity threshold applies.

⁵*Highway Design Manual*, Oregon Department of Transportation, 2003, p. 10-38.



LEGEND

- A** - Prioritized Improvements
- - New Connector

DKS Associates
TRANSPORTATION SOLUTIONS



NO SCALE

Figure 4

LONG TERM TRANSPORTATION IMPROVEMENTS MAP

Table 7: Future PM Peak Hour 2035 Intersection Performance

Intersection	Minimum Operating Standard (City/County, ODOT)	Peak Hour	Operating Conditions			Minimum Standard Met?
			Delay ¹	Level of Service	Volume-to-Capacity Ratio	
Traffic Signal Control						
<i>ODOT Facilities – Volume-to-Capacity Ratio Determines Performance Standard</i>						
I-84 WB On-Ramp/Marine Drive	0.85 V/C	AM	12.1	B	0.77	Yes
		PM	25.0	C	0.92	No
I-84 EB Off-Ramp/Marine Drive	0.85 V/C	AM	12.7	B	0.53	Yes
		PM	26.2	C	0.84	Yes
I-84 WB Off-Ramp/Graham Road	0.85 V/C	AM	9.1	A	0.87	No
		PM	9.5	A	0.68	Yes
I-84 EB On-Ramp/257th Avenue	0.85 V/C	AM	30.9	C	>1.0	No
		PM	61.7	E	0.84	Yes
<i>Multnomah County/City of Troutdale Facilities – Level of Service Determines Performance Standard</i>						
Marine Dr/ Sundial Road	LOS D	AM	>80.0	F	>1.0	No
		PM	>80.0	F	>1.0	No
257th Avenue/257th Way	LOS D	AM	12.7	B	0.78	Yes
		PM	49.9	D	>1.0	Yes
257th Avenue/Historic Columbia River Highway	LOS D	AM	77.1	E	>1.0	No
		PM	75.0	E	1.00	No

Bold – indicates intersections not meeting performance standard

¹ Average Stopped Delay per Vehicle

As shown in Table 7 above, only one of the City/County intersections would operate at acceptable levels, operating at LOS “D” or better for the 2035 “Build” condition. And even though 257th Avenue/257th Way would technically operate acceptably, its projected volume would slightly exceed its capacity. It was determined that both the 257th Avenue/257th Way and the 257th Avenue/Historic Columbia River Highway intersections are already built to their maximum reasonable capacities (or are assumed to be in the analysis summarized above) and that additional improvements at these intersections would not make sense technically or financially, even though they will operate at or near capacity during one or both peak hours in 2035.

The demand for the Marine Drive/Sundial Road intersection would substantially exceed capacity, however. Improvements at this intersection will be required and include the following:

- Improve Marine Drive to five-lanes between the existing five-lane section east of Sundial Road to approximately 500 feet west of Sundial Road
- Add a right turn lane westbound on Marine Drive at Sundial Road
- Add a southbound right turn lane on Sundial Road if and when the 238th Extension is built
- Improve Graham Road to facilitate truck use so some truck traffic will divert away from the Marine Drive/Sundial Road intersection.

Improvements at Marine Drive/Sundial Road should be pursued as opportunities arise. The intersection should be monitored as growth in the TRIP area occurs.

Three interchange ramp terminals would operate at volume-to-capacity ratios worse (higher) than ODOT's allowable 0.85 as defined in the Highway Design Manual. The I-84 Westbound On-Ramp/Marine Drive intersection operates at a $V/C=0.92$, somewhat higher than ODOT's threshold, the I-84 Westbound Off-Ramp/Graham Road intersection operates at a $V/C=0.87$, slightly higher than ODOT's threshold, and the I-84 Eastbound On-Ramp/257th Avenue operates at a $V/C>1.0$, substantially higher than ODOT's threshold. Future (2035) traffic volumes are shown in the appendix

Based on the results summarized above, the I-84 Troutdale Interchange will generally operate at an acceptable level in 2035, assuming the Two-Way Marine Drive and Marine Drive Extension projects are constructed, although design exceptions will need to be requested for the volume-to-capacity ratio at the following locations:

- I-84 Westbound On-Ramp/Marine Drive (0.07 over the HDM standard of 0.85 - PM)
- I-84 Westbound Off-Ramp/Graham Road (0.02 over the HDM standard of 0.85 - AM)
- I-84 Eastbound On-Ramp/257th Avenue (>0.15 over the HDM standard of 0.85 - AM)

Planned Facility

Short- and Mid- Term Actions

- Widen Marine Drive to a two-way five-lane cross-section under I-84 (ODOT). Specifically, the following improvements are planned:
 - Widen Marine Drive between the I-84 Eastbound Off-Ramp and the I-84 Westbound On-Ramp to include two through lanes and a 50 foot left turn lanes in the northbound direction and two through lanes in the southbound direction, which become a left and a through/left at South Frontage Road (5-lanes in total)
 - Widen the I-84 eastbound exit ramp to include one left turn lane, two through lanes and a through/right turn lane (4-lanes total)
 - Widen the I-84 eastbound exit ramp
 - Add a westbound left turn lane on North Frontage Road at Marine Drive
- Intersection improvements at Marine Drive/Sundial Road (County/Port):
 - a) Widen to a five-lane section on Marine Drive from approximately 500 feet west of intersection to existing five-lane section approximately 2,150feet east of intersection.
 - b) Add westbound right turn lane
 - c) Add southbound right turn lane (if/when 238th Extension is constructed)
- Reconstruct Graham Road
 - d) Reconstruct Graham Road between access road (approximately 900 feet west of northeast corner)and North Frontage Road intersection. Widen to improve freight movement, add storm drainage and pedestrian and bicycle facilities.

Long- Term Actions

- Construct the Marine Drive Extension, essentially a bypass to South Frontage Road, connecting I-84 eastbound and Marine Drive with 257th Avenue:
 - Construct a new one-way. Two lane, high speed, limited access roadway extending south from the Marine Drive/I-84 Eastbound Off-Ramp/South Frontage Road intersection and curving east to meet 257th Avenue at 257th Way (Outlet Mall access).

Interchange Function

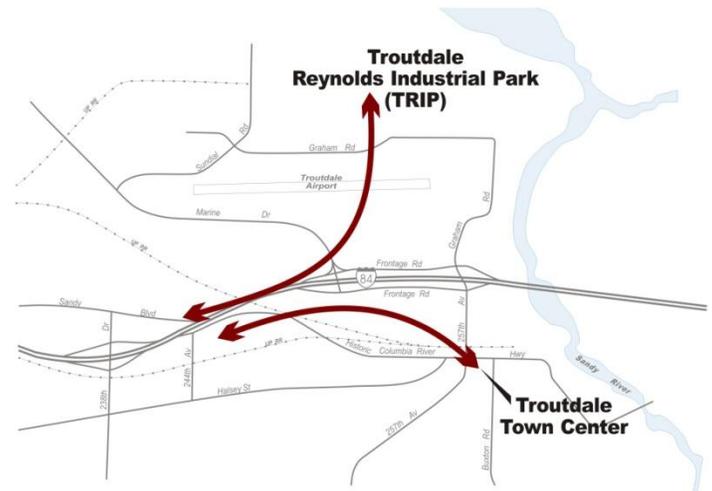
Generally, an interchange is defined as the junction of two or more roads at different elevations through a system of connections that separate the roads to permit movements to occur without crossing the streams of traffic. The

functions of the interchange are established by the functions of the connecting roads. The I-84 Troutdale interchange is a component of Interstate 84, an Interstate Highway and freight route.

The Oregon Highway Plan (OHP) classifies I-84 as an interstate highway. According to OHP, the primary function of an interstate freeway is to “provide connections to major cities, regions of the state, and other states. A secondary function in urban areas is to provide connections for regional trips within the metropolitan area.” (OHP, p. 41)

The primary function of this interchange is to provide access to industrial land between I-84 and the Columbia River, as well as serve goods movement and access to the Troutdale Town Center.

North Frontage Road and South Frontage Road and the free right turn from North Frontage Road onto Marine Drive are owned and maintained by ODOT. Marine Drive is owned and maintained by Multnomah County from the north City Limits to North Frontage Road and Graham Road is owned and maintained by the City of Troutdale, north of North Frontage.. ODOT owns and maintains Graham Road and Marine Drive between the North and South Frontage Roads. The Troutdale Transportation System Plan (TSP) classifies North Frontage Road and South Frontage Road and Marine Drive and Graham Road (between the North and South Frontage Roads) as arterials within the vicinity of the interchange. Marine Drive north of North Frontage Road is classified as a Collector and Graham Road north of North Frontage Road is classified as a local street. Graham Road south of South Frontage Road is classified as an arterial. North Frontage Road, South Frontage Road, Marine Drive and Graham Road all provide both a connection to the interstate freeway system and access to local services in town.



Much of the land surrounding the I-84 Troutdale interchange is already developed, especially to the south. The interchange provides access to Troutdale’s Town Center area as well as industrial and residential areas in the City. Many accesses are provided along the South Frontage Road to a number of businesses, most of them commercial, many serving truck traffic that passes through as it heads between Portland and the Columbia River Gorge. Many of the accesses are not in compliance with OHP standards within a ¼ mile of the interchange. Most accesses along South Frontage Road are private driveways rather than public roadways. There are only two accesses located along the North Frontage Road, midway between Graham Road and Marine Drive, serving the Troutdale Airport and an office building. There are no accesses on Marine Drive or Graham Road within the interchange area.

Future alternatives in this IAMP assume that undeveloped lands within the Study Area will be developed in a manner consistent with what is allowed under the City of Troutdale Comprehensive Plan and existing zoning.

Circulation and Access Management Plan

Access Management/Local Connectivity Plans

A key element of the IAMP related to the long-range preservation of operational efficiency and safety of the proposed interchange improvement is the management of access to the interchange crossroads (Marine Drive and Graham Road/257th Avenue), parallel roads between the interchange crossroads (South Frontage Road and North Frontage Road) as well as to the mainline (Interstate 84). Access points introduce a number of potential vehicular conflicts on a roadway and are frequently the cause of slowing or stopping vehicles, and they can significantly degrade the flow of traffic and reduce the efficiency of the transportation system. However, by reducing the overall number of access

points and providing greater separation between them, the impacts of these conflicts can be minimized. The approximate locations of the existing access locations in the interchange management area are shown in Figure 5 as well as ODOT's desired access spacing.

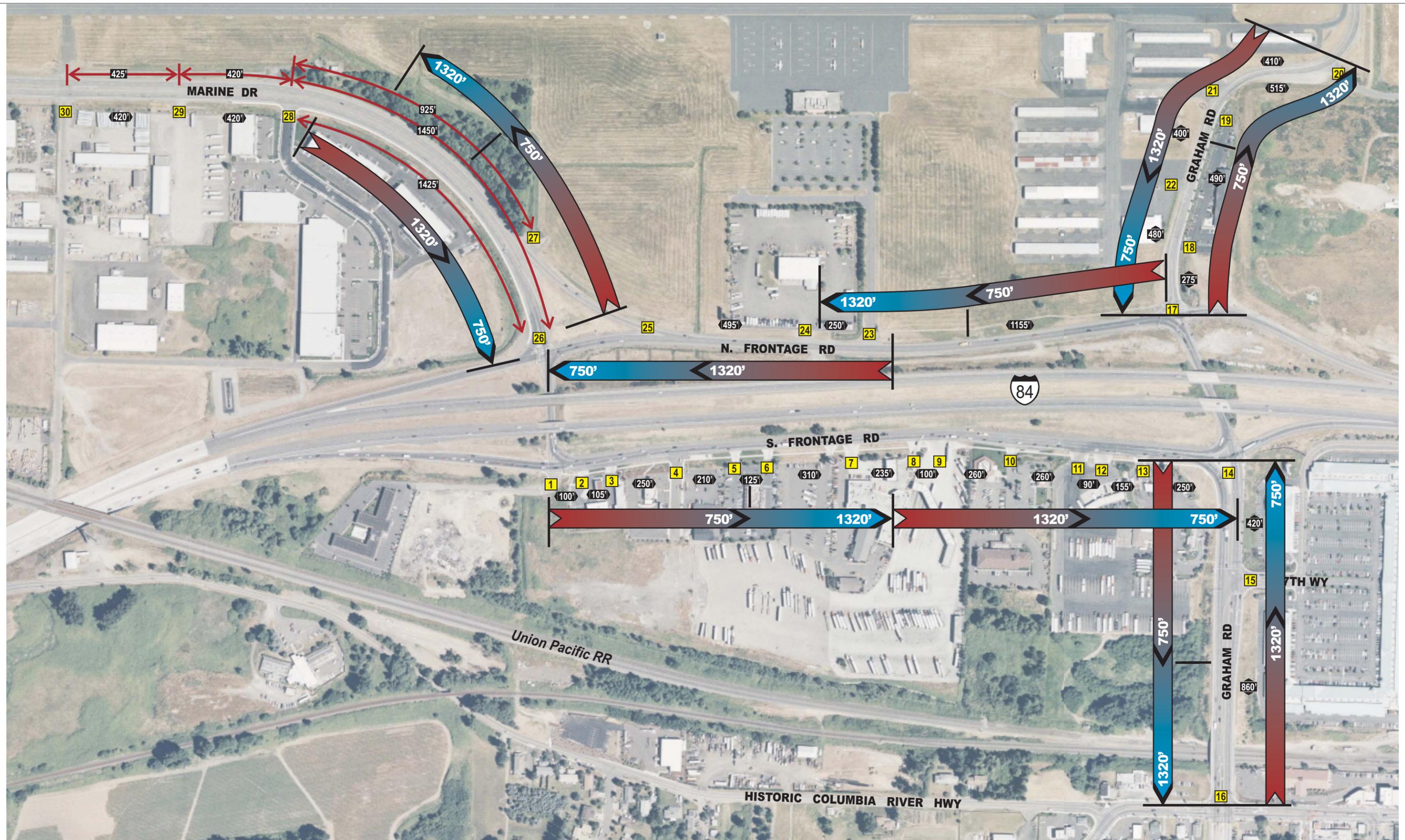
The Project Management Team (PMT) was used to develop and evaluate an access management plan. The general Access Management Plan is summarized below:

General Access Management Plan

To provide a basis for decision-making during the development of the IAMP, a general access management plan was established. The objectives of this plan are listed below.

1. Restrict all access from abutting properties to the interchange and interchange ramps.
2. Meet, or move in the direction of meeting, ODOT adopted access management spacing standards for access to interchange crossroads. Figure 5 illustrates how these standards apply to the I-84 Troutdale Interchange.
3. Meet, or move in the direction of meeting, the City of Troutdale's adopted access management guidelines on Management Area roadways maintained by the city. This would require access spacing of at least 530 feet between adjacent driveways and/or streets on the same side of the roadway on arterials and 150 feet on collectors⁶.
4. In attempting to meet access management spacing standards, exceptions may be allowed to take advantage of existing property boundaries and existing or planned public streets, and to accommodate environmental constraints.
5. Relocate private approaches on South Frontage Road onto other public streets, where feasible, to provide consolidated access to multiple properties.
6. Align approaches on opposite sides of roadways where feasible to reduce turning conflicts.
7. Short-range actions shall accommodate existing development needs.

⁶*Troutdale Transportation System Plan, 2005, Table 4-15: Recommended Access Spacing Standards for City Street Facilities.*



LEGEND
 1 - Driveway/Access Location Number
 100' - Distance Between Driveway/Access Locations



DKS Associates
 TRANSPORTATION SOLUTIONS
 NO SCALE

Figure 5
APPROXIMATE DRIVEWAY LOCATIONS & DESIRED ODOT ACCESS SPACING

Adoption and Implementation

ODOT and the City of Troutdale have jointly prepared the I-84 Troutdale IAMP in recognition of the importance of Interstate 84 and this interchange in the movement of people and goods to and from the region. It is anticipated that both ODOT and the City will adopt the IAMP, thereby codifying the joint commitment to protecting the function of the interchange as defined in the IAMP. Separate adoption processes and implementing actions exist for each agency.

This section summarizes the implementation roles and responsibilities for the respective jurisdictions.

ODOT/State of Oregon Implementing Actions

Project Construction and Access Management

- Develop needed transportation system improvements.
 - This work is underway as the I-84 Troutdale Interchange Project A improvements are currently being designed, with construction planned for 2011.
 - Pursue funding and development of physical improvements identified in this IAMP, particularly the following two projects:
 - Marine Drive Two-Way
 - Marine Drive Extension

Agency Coordination

- ODOT will continue to coordinate with the City of Troutdale and applicable state agencies, through the plan amendment and development review process, to keep land use protections in place. ODOT will also monitor and comment on any future actions that would amend the urban growth boundary.
- If future circumstances in the IAMP management area result in the need for changes to the IAMP, the City of Troutdale and ODOT shall jointly prepare amendments to the IAMP management actions and an accompanying funding plan to implement those actions.

Policy Actions

- Adopt the IAMP.

City of Troutdale Implementing Actions

Project Construction and Access Management

- The City of Troutdale will participate in the design and construction of the I-84 Troutdale Interchange that is currently underway
- The City of Troutdale will participate in the design and construction of any future improvements to the I-84/257th Interchange, in particular those identified previously in this IAMP
- The City will modify regulations pertaining to access to South Frontage Road, North Frontage Road, Marine Drive and 257th Avenue, consistent with the Access Management Plan identified in this IAMP
- The City will seek funding for identified improvement needs

Policy Actions

- The City will approve development proposals only after it is demonstrated that proposed access is consistent with the Access Management Plan in the IAMP
- The City will support land uses in the vicinity of the interchange, consistent with the land use assumptions in the IAMP. To ensure consistency with the planned transportation improvements, the City will require that any party initiating changes to the land use designations or uses allowed in the IAMP management area must also amend the IAMP.

Agency Coordination

- The City of Troutdale will coordinate with ODOT in evaluating land use actions that could affect the function of the interchange
- The City of Troutdale will coordinate with ODOT prior to amending its comprehensive plan (including the transportation system plan), land development ordinances, or urban growth boundary, or proposing transportation improvements that could affect the function of the interchange. The City of Troutdale will ensure that any such amendments are consistent with the function of the interchange as defined in the IAMP.
- If future circumstances in the IAMP management area result in the need for changes to the IAMP, the City of Troutdale and ODOT shall jointly prepare amendments to the IAMP management actions and an accompanying funding plan to implement those actions.

IAMP Adoption

Troutdale's City Council passed a resolution in support of the plan in April; 2011. approved the IAMP and forwarded it to City Council on XX, 2011.

The Oregon Transportation Commission reviewed the document in July, 2011.

Monitoring and Updates

This section discusses the need to update the IAMP, and those changes that may trigger an update over time. Conditions that would trigger such an update:

1. When the City of Troutdale's Transportation System Plan is updated, the IAMP should be reviewed and updated if necessary.
2. If the proposed land use is inconsistent with the current Comprehensive Plan Map or Zoning Map land use designation the applicant will be required to undertake a legislative process to amend and update the I-84 Troutdale Interchange Area Management Plan in order to demonstrate that the proposed amendment will be consistent with the planned improvements in. .
3. **Access Management Plan Modifications**
Recommended actions in the Access Management Plan (AMP) are based on property configurations, development application approvals, and ownership existing at the time of the I-84 Troutdale Interchange Area Management Plan's adoption. Lot consolidation and other land use actions may necessitate an amendment to the AMP. Modifications to the AMP may occur through agreement by the City of Troutdale and ODOT and require an amendment to the I-84 Troutdale Interchange Area Management Plan. Such modifications will be allowed only if the proposed modifications meet, or move in the direction of meeting, the adopted access management spacing requirements in the I-84/257th Interchange Area Management Plan.

Interstate 84/Troutdale Road IAMP



Appendix A: Public Involvement

Interstate 84/Troutdale Road IAMP



Appendix B: IAMP Boundaries, Goals & Objectives, and Evaluation Criteria

Interstate 84/Troutdale Road IAMP



Interstate 84/Troutdale Road IAMP

Goals and Objectives

The goals and objectives for the I-84 257th Avenue IAMP reflect the intentions and interests of ODOT, the City of Troutdale, the Port of Portland, Multnomah County and other key stakeholders for the interchange and transportation operations in the area. The goals and objectives are guided by, but not re-statements of, OHP policies and OAR language. The objectives need to be concrete statements that relate what the plan is trying to accomplish and should be achievable and measurable. The objectives serve as the basis for data collection and research and as alternative evaluation criteria to guide alternatives analysis and selection of the preferred alternative, and to guide management decisions.

Goal 1: Protect the function and operation of the interchange and the state highway as follows:

I-84 is classified as an Interstate Highway. It is part of the National Highway System and is a designated freight route between Portland and points east. The operational objective for Interstate Highways is to provide safe and efficient high-speed travel in urban and rural areas.

Objective 1a: The preferred IAMP will consider FHWA Interchange design requirements and will address design-year (2035) traffic demands.

Objective 1b: The IAMP alternatives developed for consideration address the OHP requirement that the maximum volume-to-capacity (V/C) ratio for the ramp terminals of interchange ramps be either 0.85 or 0.90 (as defined in the OHP).

Objective 1c: The preferred IAMP alternative will meet or move in the direction of ODOT access management spacing standards for access along interchange crossroads.

Goal 2: Provide for an adequate system of local roads and streets for access and circulation within the interchange area that minimizes local traffic through the interchange and on the interchange cross roads.

Objective 2a: The preferred IAMP alternative will include necessary supporting improvements to the surface street system in the vicinity of the interchange. Improvements to the local street network will be adopted into the local comprehensive plan, including identified funding sources, as part of the City of Troutdale's actions to implement the IAMP.

Objective 2b: The IAMP alternatives will propose surface street improvements that either meet the ODOT established access management standards or improve on the current conditions.

Objective 2c: The IAMP alternatives will propose surface street improvements that will operate in conformance with applicable standards over the 20-year planning horizon.

Goal 3: Provide safe and efficient multi-modal travel between the connecting roadways (and the surface street network, if applicable).

Objective 3a: While recognizing existing capacity constraints, the IAMP alternatives will improve safety by adding capacity to reduce congestion and/or correcting geometric conditions that do not meet current applicable standards.

Objective 3b: The IAMP alternatives will improve bicycle and pedestrian safety by providing upgraded bikeways and walkways that meet current applicable standards and include facility infill and extensions where needed to provide a continuous network.

Interstate 84/Troutdale Road IAMP

Goal 4: Ensure future changes to the planned land use system are consistent with protecting the long-term function of the interchange and the surface street system and the integration of future transportation projects and land use changes.

Objective 4a: The IAMP alternatives will be developed in partnership with affected property owners in the interchange area, the City of Troutdale, the Port of Portland, Multnomah County, and the Oregon Department of Transportation (ODOT), as well as other stakeholders, including interchange users.

Objective 4b: The City and County Comprehensive Plans and/or Transportation System Plans will be found consistent, or amendments will be proposed to ensure consistency, with the preferred IAMP alternative.

Objective 4c: The City and County will adopt land use policies that ensure future land use actions in the IAMP Management Area, including requests for comprehensive plan amendments and/or zoning amendments, and promote land development that is compatible with the planned interchange capacity for the IAMP planning horizon.

Goal 5: Recognize the importance of the interchange function to support local and regional economic development goals and plans.

Objective 5a: The IAMP alternatives are expected to reduce delay for vehicles, including commercial vehicles, accessing the freeway and to increase safety.

Objective 5b: The IAMP alternatives will facilitate access to, through, and from businesses in Troutdale.

Goal 6: Ensure that the needs of regional through trips and the timeliness of freight movements are considered when developing and implementing the IAMP, in particular when planning for improvements that directly impact freight routes.

Objective 6a: The IAMP alternatives will facilitate freight access to and from the many industrial freight destinations in the interchange study area.

Consistency with Goals and Objectives

Below, Table B-1, demonstrates how the physical improvements, access management plan and interchange area management policies address the IAMP goals and objectives described at the beginning of the IAMP.

Table B-1: How IAMP Goals and Objectives are Addressed by the IAMP

Goals and Objectives	How Goals are Addressed by Plan
Protect the function and operation of the interchange and state highway	All City intersections will operate at an acceptable level of service (LOS "D" or better) in 2035. However, both the Troutdale Road/I-5 Southbound Ramps intersection and the Troutdale Road/I-5 Northbound Ramps intersection will require design exceptions. The operation of these two intersections will be substantially improved compared to a future no-build scenario. An access management plan will be implemented as part of this IAMP to move in the direction of meeting ODOT's access spacing standards along interchange crossroads.

Interstate 84/Troutdale Road IAMP

Provide for an adequate system of local roads and streets for access and circulation within the interchange area that minimizes local traffic through the interchange and on the interchange cross road

Provide safe and efficient multi-modal travel between the connecting roadways (and the surface street network, if applicable)

Ensure future changes to the planned land use system are consistent with protecting the long-term function of the interchange and the surface street system and the integration of future transportation projects and land use changes

Recognize the importance of the interchange function to support local and regional economic development goals and plans

Ensure that the needs of regional through trips and the timeliness of freight movements are considered when developing and implementing the IAMP, in particular when planning for improvements that directly impact freight routes

A Local Connectivity Plan was not specifically developed. However, the City will pursue improved connectivity as part of the access management plan and as opportunities arise (funding, development, redevelopment, etc.) over the 25-year planning period.

Improved bicycle and pedestrian facilities are incorporated into the design for the interchange reconstruction. Any new roadway projects (including local streets) will meet current applicable standards.

To ensure that any changes in the planned land use system are consistent with the long-term function of the interchange and local street system, the IAMP proposes that any proposed changes in these designations within the Management Area (as defined by the overlay district for the I-84/257th IAMP area) require an update of the IAMP.

The proposed IAMP provides a system that facilitates travel through the interchange by reducing delay, improving level of service and increasing safety.

Regional through trips and freight movements will be improved by implementation of this IAMP. By improving level of service, reducing delay and increasing safety for all vehicles, through traffic and freight movements are improved as well.

Interstate 84/Troutdale Road IAMP



Appendix C: Existing Conditions

Interstate 84/Troutdale Road IAMP



Appendix D:South Frontage Road Access Study

Interstate 84/Troutdale Road IAMP



Appendix E: Transportation Improvement Investment Study

Interstate 84/Troutdale Road IAMP

Appendix F: Findings of Compliance

Interstate 84/Troutdale Road IAMP



Appendix G:ODOT Adoptions

Interstate 84/Troutdale Road IAMP



Appendix H: City of Troutdale Final Ordinances