



Planning Commission

Agenda

Study Session

January 8, 2018

Noon

Lausmann Annex, Room 151
200 South Ivy Street, Medford, Oregon

10. Introductions
20. Discussion items
 - 20.1 **CP-16-036 Transportation System Plan Policy Topics**
30. Adjournment

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MEMORANDUM

Subject Transportation System Plan Policy Topics
File no. CP-16-036
To Planning Commission *for 01/08/2018 Study Session*
From Carla Angeli Paladino, CFM, Principal Planner
Date January 3, 2018

OVERVIEW

Staff is working on the update to the Transportation System Plan. The Transportation System Plan will guide transportation investments and policy over the next twenty years (2018-2038). Staff continues to work with both the Citizen Advisory Committee and Technical Advisory Committee on the project details, as well as Kittelson and Associates, the City’s consultant hired to finalize the technical analysis and provide the draft plan.

To date, the following transportation topics have been discussed with City Council:

- Goals, Objectives, and Actions
- Level of Service and Concurrency
- Transportation Planning Rule (TPR)

Later this month, Council will discuss Roadway Design and Implementation. This topic includes a review of street cross sections for the different types of streets, and a conversation about existing roadways and how they may be retrofitted in order to better meet the needs of the traveling public. The City will also be hosting four open houses in each of the four wards in January to discuss the proposed transportation projects with the public. The projects include roadway, bicycle and pedestrian, and intersection improvements. In February, the City Council will evaluate the project list in more detail and provide guidance on the priority of these projects and the timing for their implementation in the updated plan.

POLICY ISSUES

The Planning Commission is the advisory body that will make a recommendation on the Transportation System Plan when the project goes through the hearing process. As such, it is important the topics covered by City Council are also explained and discussed with the Planning Commission in order to understand the details of the document. The following memoranda were developed and provided to the City Council to help provide

context and information about each of these topics. A review of these topics will bring the Planning Commission up-to-date with the conversations thus far with City Council and the other advisory committees.

LEVEL OF SERVICE (LOS) AND CONCURRENCY

The first memorandum dated October 5, 2017, details the City's level of service (LOS) standard and concurrency policy. Level of Service is a standard that measures or designates the expected level of operation of an intersection. It is represented on a graduated scale as a grade from A to F, with "A" representing minimal delays and "F" representing more delays. The grade represents the average amount of time in seconds a vehicle waits at a stopped controlled intersection (e.g. traffic signal or stop sign) before moving through the intersection. The City measures LOS at signalized intersections on arterial and collector streets. The current Level of Service standard for the City is D. This standard is important because it impacts how a developer will proceed with a particular development proposal (will improvements be made to the intersection to mitigate the impact of traffic attributable to the development or will the proposal be capped or reduced in some manner to stay below the LOS D threshold). *See Exhibit 1* for the full report and attachments

TRANSPORTATION PLANNING RULE (TPR)

The Transportation System Plan (TSP) must be in compliance with the Transportation Planning Rule (the Oregon Administrative Rules that enact Statewide Planning Goal 12). In 2011, the rule was amended and adopted by the Land Conservation and Development Commission and went into effect on January 1, 2012. The amendments provide additional tools for jurisdictions to use when approving amendments to plans and regulations or when imposing mitigation measures for certain types of development. Since the City's TSP is being updated and the amended rules are not included in the existing plan, staff finds it relevant to evaluate the changes and identify if any of the new provisions should be explicitly incorporated into the new TSP. *See Exhibit 2* for the full report and attachments.

LEVEL OF TRAFFIC STRESS

Similar to Level of Service (LOS), Level of Traffic Stress (LTS) is a graduated scale from 1–4 that measures the level of stress experienced by a pedestrian or bicyclist on a roadway. This type of measurement does not currently exist in the City's Transportation System Plan. This topic has been discussed with the Citizen Advisory Committee but not with City Council. *See Exhibit 3* for the explanation of LTS and how it may be applied in the updated plan

PLANNING COMMISSION DIRECTION

The Planning Commission is being asked to review the attached memoranda and provide staff with additional direction or comments on how to better incorporate these topics into the updated TSP.

EXHIBITS

- 1 - City Council memorandum dated October 5, 2017
- 2 - City Council memorandum dated November 22, 2017
- 3 - Planning Commission memorandum dated December 6, 2017



Planning Department

Working with the community to shape a vibrant and exceptional city

MEMORANDUM

Subject Transportation System Plan – Policy Discussion

File no. CP-16-036

To Mayor & City Council *for 10/12/2017 Study Session*

From Matt Brinkley, AICP CFM, Planning Director
 Karl H. MacNair, Transportation Manager, P.E. and
 Carla Angeli Paladino, CFM, Principal Planner

Date October 5, 2017

TSP PROGRESS UPDATE & BACKGROUND

The Transportation System Plan provides guidance for development and operation of the City’s transportation network over a 20 year planning period and beyond. It provides for the strategic and deliberate investment of limited financial resources into an array of public infrastructure that directly bears upon the community’s capacity to provide an appealing place to live and work.

As such, the TSP is both influenced by and influences broader policy issues. Staff has identified 4 critical policy issues that should be addressed by City Council and other decision makers and stakeholders through the TSP update process. While this list may not be exhaustive, staff believes that it is essential for decision makers to understand these issues in order to make informed decisions that could have profound consequences. These issues have been identified by Staff due to the reach and breadth of their impact as well as their complexity and inter-relatedness to other policy issues. The 4 issue areas are:

1. Level of Service (LOS) and Concurrency
2. Transportation Planning Rule (TPR)
3. Roadway Design and Implementation
4. Very Significant Projects—South Stage Overcrossing

This memo and accompanying presentation address the first issue: Level of Service (LOS) and Concurrency. As explained in greater detail below, LOS is the operational standard to which we build our intersections; Concurrency is the policy that implements that standard. Application of our current LOS has substantial implications for development as well as the long term operational viability of our road network. While it is designed to preserve the adequate function of intersections, it can constrain the very

development that generates System Development Charges that enable the City to pay for improvements to our road network that provide needed capacity.

COUNCIL DIRECTION

Staff is asking Council to review the materials and provide direction on the City's Level of Service (LOS) standard. The current Transportation System Plan and development code regulations use LOS D as the standard and do not allow development to proceed if this standard is not met. Council is being asked if the TSP update should maintain the current standard, implement the standard in a different way, and/or use a different standard altogether. The issue is framed for the Council below and has been discussed in a series of meetings with Councilors and citizen appointed ward representatives.

PRESENTATION OUTLINE

Introduction and Presentation –

 Matt Brinkley, TSP progress update;

 Cory Crebbin, Level of Service (LOS) and Concurrency

Discussion and Direction – Mayor and City Council

OVERVIEW

Functional Classification Map

All of the streets within the City are categorized as a specific type of street (e.g. arterial, collector, commercial/industrial, residential) based on traffic movement and access functions. Higher order streets (arterials and collectors) are identified on the City's Functional Classification map which was provided to the Council in September (**Exhibit A**). The arterials and collectors are further separated into major and minor designations. Each designation relates to a specific cross section which enables the City to determine right-of-way and improvements needed over time. All existing and proposed streets are classified using this classification structure.

Chapter 10.427 of the Municipal Code states, "the intent of the street classification system is to:

- 1) Promote the safety and convenience of vehicular, pedestrian, and bicycle traffic;
- 2) Protect the safety of neighborhood residents;
- 3) Protect the residential character of neighborhoods by limiting traffic volume, speed, noise, and fumes and;
- 4) Encourage the efficient use of land."

Streets are designated and cross sections are provided in order to direct how a street will build out when it is constructed or (for existing streets) as it is improved. The major and minor street classifications identify all of the elements necessary to accommodate the various modes. The built and natural environment and their inherent constraints require some level of flexibility when deciding on the final design of a street.

What is Level of Service? What is the City’s current standard? What is concurrency?

Simply put, LOS is a standard that measures or designates the level of operation of an intersection. LOS is identified on a graduated scale and represented as a grade from A to F. It is measured in seconds and defines the average maximum amount of time a vehicle must wait at a stopped controlled intersection (e.g. a traffic signal or stop sign) before proceeding. LOS is based on intersection operation during a specific point in time—the morning or evening peak or “rush hour”—when heavily trafficked roads and intersections experience greatest demand. A grade of ‘A’ represents minimal delays while ‘F’ represents more auto delays. Currently, the City’s standard is LOS D. (Note: State highways are evaluated for deficiencies using a different standard known as volume-to-capacity ratios, or “v/c ratio”.)

Section 10.462 of the Municipal Code provides the description of Level of Service for arterials and collectors (shown in the left-hand columns). The right-hand columns are added to show the specific measurement in seconds.

**TABLE IV-2
 SERVICE LEVELS FOR ARTERIAL AND COLLECTOR STREETS**

Typical Traffic Flow Conditions		Average Control Delay per Vehicle (seconds) for a Signalized Intersection¹	Average Control Delay per Vehicle (seconds) for a Stop Controlled Intersection¹
Service Level A	Relatively free flow of traffic with some stops at signalized or stop sign controlled intersections. Average speeds would be at least 30 miles per hour.	10.0 or less	10.0 or less

¹ Source: Transportation Research Board, Highway Capacity Manual, 6th Edition (Washington, D.C. 2016)

Typical Traffic Flow Conditions		Average Control Delay per Vehicle (seconds) for a Signalized Intersection¹	Average Control Delay per Vehicle (seconds) for a Stop Controlled Intersection¹
Service Level B	Stable traffic flow with slight delays at signalized or stop sign controlled intersections. Average speed would vary between 25 and 30 miles per hour.	10.1 to 20.0	10.1 to 15.0
Service Level C	Stable traffic flow but with delays at signalized or stop sign controlled intersections to be greater than at Level B but yet acceptable to the motorist. The average speeds would vary between 20 and 25 miles per hour.	20.1 to 35.0	15.1 to 25.0
Service Level D	Traffic flow would approach unstable operating conditions. Delays at signalized or stop sign controlled intersections would be tolerable and could include waiting through several signal cycles for some motorists. The average speeds would vary between 15 and 20 miles per hour.	35.1 to 55.0	25.1 to 35.0
Service Level E	Traffic flow would be unstable with congestion and intolerable delays to motorists. The average speed would be approximately 15 miles per hour.	55.1 to 80.0	35.1 to 50.0
Service Level F	Traffic flow would be forced and jammed with stop and go operating conditions and intolerable delays. The average speed would be less than 15 miles per hour.	Greater than 80.0	Greater than 50.0

If the LOS D standard is not met for arterials or collectors, new development is not permitted to occur unless the developer makes the necessary improvements to meet the standard. Knowing the requirement and associated cost to construct the necessary improvements, the developer must decide on whether to abandon the project (because the improvements are too costly), reduce the scope of the project in order to fall below the threshold that requires improvements, or build the improvements. The impacts to

the City if the project is abandoned results in a missed opportunity for additional development within the City and associated fees and charges that would have been collected to help support the overall transportation and utility systems. It also may mean development occurs farther out from the core or in a different city altogether. If the project is only partially developed then land is under-utilized and the fees and charges collected are below what was projected to be provided by the development. A different LOS standard at the intersection could mean the project moves forward and the City accepts increased congestion at the intersection for that peak time frame or allows other mitigation measures to offset the congestion. The developer's obligation to provide transportation improvements to mitigate the development's impacts to the system prior to or simultaneously with building construction is known as concurrency.

In 2014, the City of Medford changed code section 10.426 to require a peak hour factor of 1.0 instead of using actual peak hour factors. This change essentially means that LOS is now calculated over the entire peak hour, instead of the worst 15 minutes of the peak hour. This change influences what the calculated level of service is for studied intersections and helps the intersection meet the standard.

Why is it important?

The Level of Service standard is important because it provides a standard to measure roadway facility adequacy. Paired with concurrency, it ensures developments mitigate the additional trips they are adding to the system. Theoretically, this ensures development is served by appropriately sized public infrastructure and that the transportation network overall, or at least in the area affected by development, continues to provide the same operational capacity and experience for users that it did prior to new development. However, as with any policy, there are unintended consequences that result from this requirement.

What is the issue with the current Level of Service standard?

The current Level of Service standard assumes a "one size fits all" approach to the City's transportation system. This involves a very finite evaluation of how the intersection is performing in terms of delay during the worst one hour period of a 24 hour day. This standard does not take into consideration other factors such as actual intersection operation, safety (vehicular, pedestrian or bicycle) or queuing that impact the functionality of the facility.

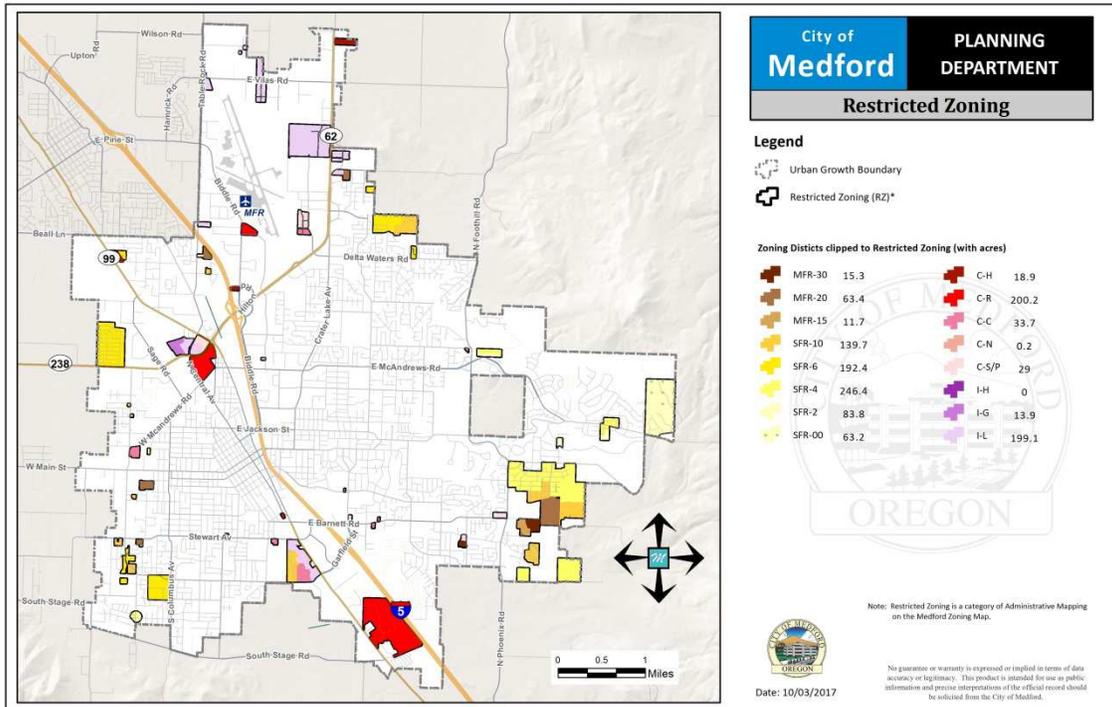
Level of Service plays an important role in how and where development occurs and what restrictions are placed on a particular development site. The City requires a traffic impact analysis at the time of zone change application. These analyses identify where impacts will occur at studied intersections. For those intersections that fall below LOS D in the build year, the applicant may be subject to a number of restrictions (property identified as having a restricted zoning overlay) such as a trip cap (uses proposed cannot

exceed a specified number of average daily trips per day), a restriction on types of uses allowed (e.g. high traffic generators such as fast food restaurant), or infrastructure improvements (e.g. installation of a traffic signal). These types of restrictions place a financial burden on the property owner and limit the overall development potential of a project site. Such restrictions delay when and how these sites build out, thereby impacting issues such as economic development, business operation, and housing.

A Geographical Information Services (GIS) calculation of how many acres of land within the City limits are subject to some form of restricted zoning is 1,310 acres (note some of these sites are restricted based on sewer or water inadequacy). The breakdown of these acres by land use category is:

- Single Family Residential (SFR) zones (725 acres)
- Multi-Family Residential (MFR) zones (90 acres)
- Commercial zones (282 acres)
- Industrial zones (213 acres)

The map showing the restricted zoning locations is below.



The topic of Level of Service is important to discuss in terms of what the appropriate standard is and where it applies, but also when is the appropriate time to evaluate and regulate the adopted standard. As mentioned above, Level of Service is evaluated at the time of zone change application in Medford. In some jurisdictions, Level of Service and a development's impacts are regulated at the time of site review. This distinction is

important as no buildings are typically built at the time of zone change and may not be built for many years following such application. Therefore, identifying impacts at the time of zone change may be premature or not necessarily reflective of the impacts that may be relevant at the time of site construction. A review of project impacts on the transportation system may be better served with a traffic impact analysis at the time of site development. *Staff has been discussing this alternative and thinks it is an important discussion topic that needs to be addressed as we make necessary regulatory changes in conjunction with the Transportation System Plan update.*

The other consideration about Level of Service relates to project prioritization and funding. The example of the intersection of Sunrise and Jackson Street provides a good illustration. This intersection will fail in 2038, as modeling shows this intersection will operate at LOS E. In other words, more vehicles pass through this intersection at its peak hour than it can accommodate without causing operational degradation. An aerial of this intersection is provided below.



Jackson Street runs east/west while Sunrise runs north/south. The intersection is signalized with dedicated turn lanes in all directions, sidewalk and bicycle lanes on Jackson and along portions of Sunrise Avenue. One possible mitigation tool to maintain LOS D in the planning horizon is to install a dedicated right turn lane on the west bound approach on Jackson (red circled area). Such an improvement would impact the two adjacent property owners on the northeast side of the intersection significantly. The

mitigation will improve the Level of Service to C but is it worth the impacts to the surrounding property owners? Does the intersection function well enough? Are there other streets that could be improved that would reduce congestion at this location and where funding could be provided? The Level of Service standard raises all of these questions. If flexibility or other options were built into the LOS standard then alternative mitigation measures could be considered and implemented. Some examples of other mitigation measures may include:

- Adjust the Level of Service standard in high traffic areas. Reduce the standard to LOS E or LOS F in designated areas (such as Downtown)
- Adjust the LOS based on the intersection (stop controlled vs. signalized)
- Developments to pay a pro-rata share of future improvements so last development in does not trigger and have to pay for the full improvement
- Provide an improvement in a different location that alters traffic flow and /or reduces demand on the failing intersection

There are likely situations where no improvements can be provided to meet the standard so other forms of mitigation could be beneficial in order to move a project forward. More detailed examples are provided in the memorandum from Kittelson & Associates dated June 28, 2013 **Exhibit B**.

Many jurisdictions require that developers pay a pro-rata share of planned improvements to avoid the development that triggers the improvement from being responsible for the entire cost. For example, there were several zone changes in the Southeast area that were all conditioned to install a signal at Pierce Rd. and Hillcrest Ave. After McAndrews was built east of Foothill, the traffic patterns changed and this improvement was no longer needed. The modeling for the TSP update is showing that the signal will be needed by 2038. If a pro-rata share arrangement were used, developments that contribute trips to that intersection would share the cost.

How do other cities handle Level of Service?

Bend and Eugene have multiple categories of standards **Exhibits C and D**. In Bend, there are different standards defined for two-way stop control (TWSC), all-way stop control (AWSC), 95th percentile queues, and signals or roundabouts. Eugene's TSP identifies different standards geographically. For example, while the citywide standard is LOS E, Eugene's downtown is identified as a Traffic Impact Analysis Exempt Area where LOS F is acceptable, and alternative targets were proposed on several ODOT intersections.

ODOT uses a measure known as Volume-to-Capacity (V/C) Ratio. Bend uses maximum delay, akin to LOS, for stop controlled intersections, but uses V/C ratio for signal and roundabout evaluation. V/C represents a facility's level of congestion. V/C values range from 0.01 to 1.00. Lower numbers indicate the intersection has low congestion. Values

closer to 1.00 indicate more congestion. V/C ratio standards may be a more appropriate measure for signalized intersections because it's measuring against the calculated capacity of the intersection as opposed to how much delay is experienced on average.

The City of Medford code defines the study area of a Traffic Impact Analysis (TIA) to include any intersection impacted by at least 25 peak hour trips. Bend limits their study area to intersections within one mile of the proposed development impacted by at least 15 peak hour trips. The distance limitation prevents large developments from being limited or being required to mitigate intersections that are farther from the development.

The Cities of Bend, Portland, and others allow for alternative mitigation measures. Oregon's Transportation Planning Rule (the TPR) was updated in 2012 to allow local governments to use alternative mitigations. Some of the alternative mitigation measures allowed include: mitigating with improvements that benefit other modes, improvements to other facilities, or improvements at other locations that provide balancing system wide benefits; allowing development where there is an already failing facility if the development can be shown to prevent further degradation of the failing facility; exempt a "multi-modal mixed use area" from vehicle traffic congestion performance standards; and allowing partial mitigation for "Industrial" or "Traded Sector" jobs provided certain requirements are met. The TPR does not require any of these measures be implemented; it only allows them as options for local governments. Because Medford's code currently requires that LOS D be maintained, these alternative mitigations are not currently available in Medford.

Another change to the TPR in 2012 allows local governments to approve zone changes as long as the proposed zoning is consistent with the comprehensive plan map designation and the local government's acknowledged TSP. This means that the City of Medford does not have to require Traffic Impact Analysis (TIA), and concurrency, at the time of zone change, which is the current code requirement. The City of Medford could instead require a TIA, and concurrency, at the time of site plan or land division. Any changes to the comprehensive plan would still require a TIA to determine the impacts at the end of the planning period (2038). Moving the concurrency requirement to later in the development process would mean that there is more certainty about what development is being proposed and how many vehicle trips it is expected to generate. This could allow the TIA to be more useful to staff and developers in identifying mitigation measures and alternative mitigation measures, if implemented. Given the range of potential trip generations in commercial development (i.e. offices compared to fast food) this could help with the problem of both over-estimating and under-estimating trips for a specific development.

The City of Bend recently updated their TSP and development code for Transportation Analysis to incorporate many of these ideas. It places limitations on roadway widening to accommodate travel lanes for mitigation when improvements may result in unacceptable trade-offs to other modes of travel or no physical mitigation is available to improve intersection operations to the performance standard. They also prohibit widening to accommodate travel lanes within their downtown or historic district and along certain streets identified in their TSP as “not being authorized for lane expansion.” Further, the City Manager has the ability to suspend the mobility standard for a particular intersection where widening might result in unacceptable trade-offs to other modes of travel.

STAFF RECOMMENDATION

Traffic Congestion Performance Measures

- Distinguish between intersection control types and incorporate intersection capacity (V/C ratio) in vehicle traffic congestion mobility standards similar to the City of Bend standards.
- Distinguish between built-out and developing areas by establishing different mobility standards for different parts of the City, similar to the City of Eugene standards. Consider including a TIA exempt area in the vicinity of downtown Medford.
- Incorporate limitations on roadway widening to accommodate additional travel lanes when improvements may result in unacceptable trade-offs to other modes of travel similar to the City of Bend. Consider granting the City Manager, Planning Commission, or City Council the ability to suspend or alter Traffic Congestion Performance Measures for a particular intersection.

Transportation Analysis Requirements

- Implement a specific safety review and mitigation requirement to ensure that additional congestion is not creating an unsafe environment.
- Implement a specific pedestrian, bicycle, and transit review and mitigation requirement to ensure that developments provide mobility for all modes.
- Review the TIA study area definition and consider a specific distance limitation.
- Consider making residences constructed above ground-floor commercial exempt from the trip generation calculations.
- Consider adopting a roundabout first policy

Development Mitigation Options

- Allow alternative mitigation strategies to be used by developments.
- Consider moving the requirement for concurrency to the time of development application.
- Consider implementing proportional share requirements for needed improvements as identified within the City's adopted TSP

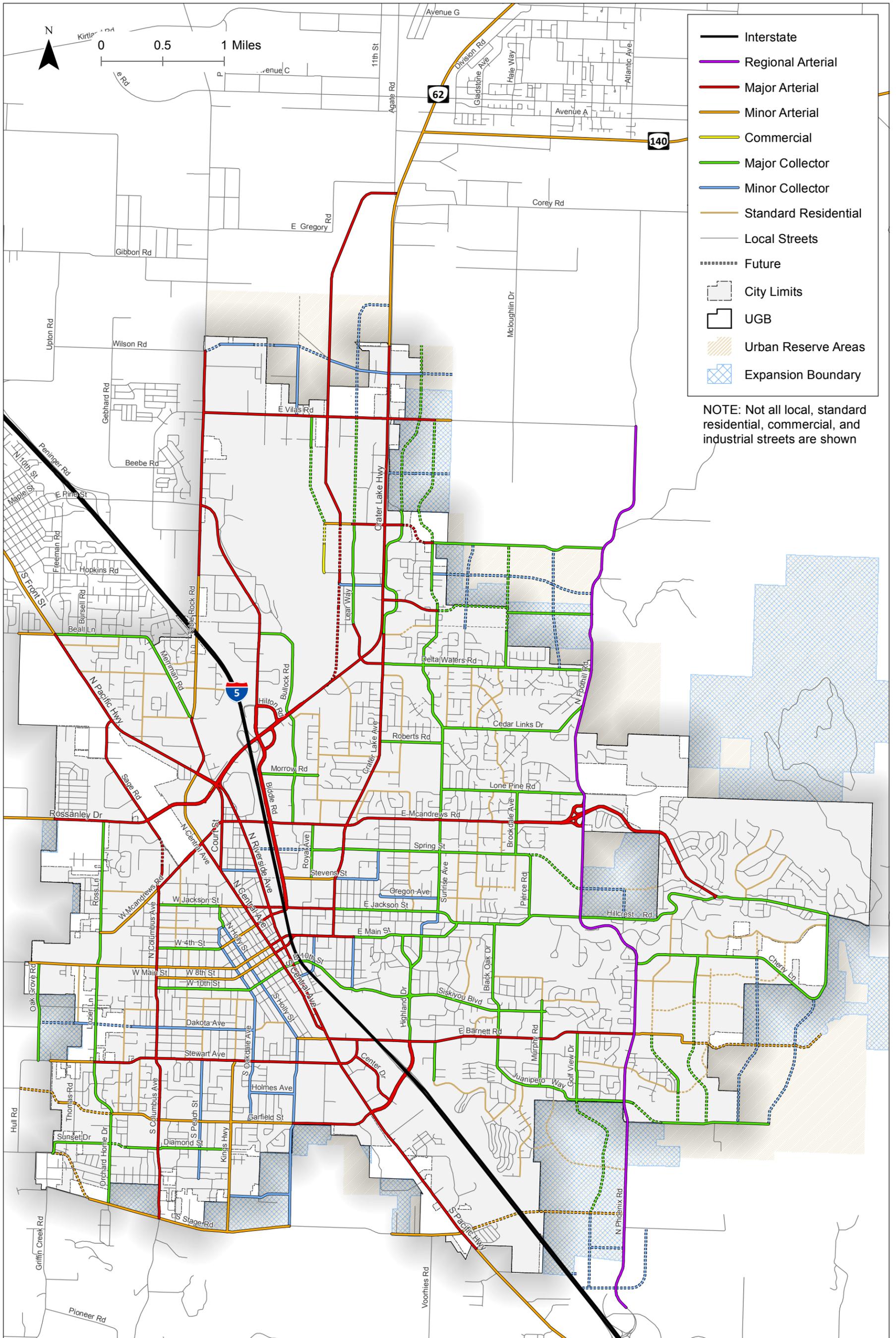
EXHIBITS

A: Functional Classification Map

B: Kittelson & Associates memorandum dated June 28, 2013

C: City of Bend Transportation Analysis regulations

D: City of Eugene Performance Measurements



Roadway Functional Classifications
Medford, Oregon

Figure
1

HI:2121255 - City of Medford TSP Supplemental Functional Classifications.mxd - Jacksonville - 7:48 PM 9/6/2017



Task 4.4: Performance Measures Review

Date: June 28, 2013 Project #: 10771
To: Alex Georgevitch, City of Medford
From: Joe Bessman, Julia Kuhn, and Matt Kittelson
Project: City of Medford TSP/UGB Amendment
Subject: Performance Measures Review

This memorandum presents a comparison of the performance measures being applied in other jurisdictions and on corridors. This effort identifies how other agencies manage their transportation system, particularly within urban environments. This also includes consideration of how a balance between multi-modal goals and development of parallel routes can be incorporated.

PERFORMANCE MEASURE REVIEW

To inform this process, performance measures of other agencies within Oregon and Washington were reviewed. The following items were reviewed:

- ODOT alternative mobility targets
- Draft TRIP97 performance metrics
- City of Eugene, Oregon
- City of Portland, Oregon
- City of Bend, Oregon
- City of Vancouver, Washington
- Downtown Vancouver multi-modal reductions

A review of each of these policies and approaches, and how they pertain or could be applied to Medford, is summarized below.

ODOT Alternative Mobility Targets

ODOT has historically relied on a volume-to-capacity ratio as a singular metric for highway performance. Within the 1999 Oregon Highway Plan, Policy 1F.6 describes the mobility standards for State Highway Facilities. This was prepared as two separate standards, one within the Portland-Metro Region to account for the higher congestion, and a second standard for all other areas of the State. The mobility standard varies based on whether or not the location is within an Urban Growth Boundary, a Metropolitan Planning Organization (MPO), the posted speed, the

State classification of the highway, and whether special highway designations have been applied. The Policy does not explicitly distinguish between signalized and unsignalized intersections, though regional interpretations may make this distinction by applying the minor street classification to stop-controlled intersections in considering the appropriate standard.

The framework for application of ODOT mobility targets is as follows:

- Assess the 30th highest annual hour
- Consider conditions during the peak fifteen minutes of this hour
- Include an 8-percent capacity reduction (ideal saturation flow rate reduction) at traffic signals in areas outside of the Portland-Metro area to account for reduced driver attentiveness in less congested areas.
- Consider conditions during the controlling period of the adopted Transportation System Plan(s), which requires analysis of 15-years (for compliance with the State Transportation System Plan) or more depending on City or County plans.

The application of these stringent mobility targets, particularly with less available funding, was considered through a joint committee meeting between the Land Conservation Development Commission and the Oregon Transportation Commission in 2011. This joint session led to the creation of Senate Bill 795, which required revisions to the mobility targets and to policies governing plan amendments to address the unintended consequences of these policies.

Changes that were subsequently implemented include revision of ODOT “mobility standards” to “mobility targets.” This maintained the same overall structure and application of the v/c ratio, but increased the mobility threshold across all classifications. At the same time, the OHP revisions now allow performance measures other than a v/c ratio so that agencies can better balance the economic, multi-modal, urban density, or community goals with automobile throughput.

While other measures and considerations are allowed, ODOT has provided additional guidance on ways that the existing v/c ratio can be modified as a surrogate for these other goals. Following guidance from ODOT’s December 30, 2009 interoffice memo¹, the following steps are provided for setting alternative mobility targets:

1. Identify all feasible improvements (based on reasonable expectations of funding likely through the planning horizon).
2. If the intersection meets the mobility target with improvements, no changes are needed.
3. If the intersection is greater than the mobility target but less than a v/c ratio of 1.0, establish the standard based on the projected performance.
4. Identify whether the overall hour (versus the 15 minute peak) can remain below a v/c ratio of 1.0.

¹ December 30, 2009 interoffice memo *Methodology for OHP Alternate Mobility Standards in Region 2*, written by Erik Havig.

5. Consider the average annual v/c ratio rather than the 30th highest design hour.
6. Consider an alternative analysis period (such as second highest hour).
7. All changes to highway mobility targets need to request adoption from the OTC.

These same steps are identified within the Planning Business draft for Alternative Mobility Targets², and continue to remain centered on the v/c ratio, but with changes to how it is applied, the hourly period it is applied within, and the seasonal period.

TRIP97 Performance Measures

Transportation Reinvestment Innovation and Planning (TRIP) US 97 is a multi-agency partnership established to develop a set of performance measures, funding mechanisms, and a governance structure to manage the US 97 corridor through Deschutes and Jefferson Counties in Central Oregon. The project was developed to fundamentally alter the “point” based analysis of each intersection on the highway, considering only automobile mobility during the peak-fifteen minutes of the 30th highest hour at the end of the planning horizon, and instead assessing the highway at a corridor level. This approach allows the partnership to prioritize investments based on where they could provide the greatest benefit to the system, and to better inform and balance the safety, mobility, and context tradeoffs being made.

The performance measures for TRIP97 encompass a range of metrics that allow the Partnership to assess how projects or growth affects the overall corridor vision. This vision identifies the overarching goals for the corridor, which includes an emphasis on safety, continued highway mobility, limiting impacts to the built and natural environment, improved local/supporting system connectivity and access to the highway, supporting job growth, and promoting alternative travel modes.

As the US 97 corridor includes both urban and rural segments, and “Main Street” as well as urban expressway segments, the performance measures could not be applied uniformly as different measures have varying degrees of importance depending on the context. To address this, performance measures were divided into two categories: 1) corridor metrics, that holistically evaluate the entire highway section between Deschutes and Jefferson Counties; and 2) segment metrics, that assess individual sections of the highway.

Corridor metrics are entirely monetizable, and lend themselves to a cost/benefit ratio. These measures provide a system perspective, and include the following metrics:

- Average Travel Time
- Travel Time Reliability
- Change in Job Potential

² Pre-dated draft 2013 Planning Business Line Item Operational Notice, *Alternative Mobility Targets*, number PB-02.

- Expected Crash Frequency
- Greenhouse Gas Emissions

Segment metrics include various units of measures, and cannot be readily combined. They are measured as a percent change relative to a standard or normalized value, and scored between +3 and -3. These values are then given a weighting by the managing agencies for each individual segment. These are then combined into a numeric score for each individual corridor segment. Segment metrics include the following:

- Average Travel Time
- Travel Time Reliability
- Side Street Delay
- Expected Crash Frequency
- Turning Movement Opportunities per Mile
- Percent of North-South traffic on US 97
- Multi-modal Level of Service

Analysis of these performance measures is provided by existing software programs, ODOT Travel Demand Models, and adaptation of tools that were constructed through national research efforts. It is expected that the tools will be simplified as software fully incorporates the Highway Capacity Manual 2010 methodologies.

TRIP97 Relevance to the City of Medford

The performance measures within TRIP97 provide a holistic assessment of the US 97 corridor, but the additional complexity would not be appropriate to apply on a citywide basis within the City of Medford. TRIP97 was intended to address larger-scale planning issues (such as UGB amendments or major employment centers) where the additional analysis effort is warranted. Within Medford, this construct would be best suited toward managing critical corridor segments, particularly those with changing characteristics or management goals, or of a regional importance.

City of Bend, Oregon

The City of Bend performance measures are intersection based, and vary by intersection control type. All operational analysis within the City of Bend is focused on the overall hour, though the City experiences sharp peaking characteristics around 5:00 p.m. A summary of performance measure by control type is provided below:

- Two-way stop-controlled intersections: The City of Bend does not have a performance standard for low-volume intersections. At stop-controlled intersections serving more than

100 peak hour trips on the minor (stop-controlled) approach the City requires that the approach operate better than Level of Service “F” (less than 50 seconds of delay).

- All-way stop-controlled intersections require that the overall average delay is less than 80 seconds (Level of Service “E” or better).
- The analysis of roundabouts is conducted based on the overall intersection, and requires that it operate below capacity (v/c ratio less than 1.0).
- Signalized intersections are required to operate with a v/c ratio of less than 1.0 (below capacity). Intersections that are located within historic areas, or built-out to its master-planned size must operate with a v/c ratio of less than 1.0 during the hour preceding or following the peak hour.

In addition to these standards, the City of Bend has a concurrency requirement to ensure transportation facilities are provided when needed. The City also contains a pro-rata contribution requirement, which allows the City to collect fees toward intersections that are currently operating acceptably where master-planned improvements are not in place. The pro-rata system is intended to avoid the “last man in” construct where the developer that exceeds the performance measure is required to pay the entire mitigation costs.

The City of Bend actively considers intersection safety in its mitigation needs. The City requires that intersection crash records be reviewed at all intersections, and actively enforces sight distance and clear zone requirements. The City places a high emphasis on pedestrian, transit, and bicycle connectivity during the site plan review phase of development projects, and actively looks to limit individual or direct property access where feasible.

Relevance to the City of Medford

The City of Medford’s performance standard is based on the peak 15-minute period and applies universally to all control types. As delay is defined differently for various control forms, Medford’s Level of Service “D” standard applies a more conservative requirement to minor stop-controlled intersections, where infrastructure improvements may be undesirable or unnecessary. The City of Bend assesses all of its intersections during the peak hour (rather than fifteen-minute period) and generally accepts all operations short of failure.

City of Eugene Performance Measures

Performance measures for the City of Eugene can be found within 9.9650 of the City’s Development Code. The City of Eugene (and Lane County) base intersection operations on level-of-service (LOS). Both jurisdictions currently specify the maintenance of LOS “D” at signalized intersections. This performance standard is used to ensure reliable and acceptable roadway system performance, and is applied to private developments, zone changes, and system planning.

As exception to this policy is within Eugene's Central Area Transportation Study (CATS) area boundary (primarily downtown and near the University of Oregon campus), where the city allows LOS "E" for intersection operations. The City code also notes that while service levels may be substandard, improvements may not be feasible. Where safety is not being compromised the City may accept the deficiency temporarily while system constraints (such as environmental, public agency financial resources, or land use constraints) are overcome or addressed through alternative strategies (such as Transportation Demand Management, land use changes, or short-term safety improvements).

The City of Eugene also provides requirements for transit, bicycle, and pedestrian modes. These are generally to increase the attractiveness, connectivity, and convenience of these travel modes. New bikeways are required as part of new or reconstructed arterial and major collector streets, and sidewalks are required along all arterial and collector roadways.

Relevance to the City of Medford

A similar approach to the City of Eugene's adopted CATS boundary could be applied to specific areas in Medford where higher tolerance for congestion would be allowed. This could include areas such as the identified Transit Oriented Districts, downtown area, or built-out areas where further widening would not be desirable. The City of Medford also provides general requirements for other travel modes so that system adequacy can be considered for all users.

City of Portland Performance Measures

Detailed analysis is typically required only for rezones, conditional uses, parking reviews, master plans, and impact mitigation plans. New development zoned outright typically is required only to assess the general safety and circulation needs at the access points, as system impacts are assumed to be accounted for within the City's adopted transportation plans.

Where assessment of facilities is required, the City of Portland typically uses a Level of Service "D" standard when assessing system adequacy per City Policy 11.13. The City allows alternative measures to be applied in mixed-use areas, areas with mode splits consistent with the established targets, areas with maximum parking ratios, or where adequate street connectivity exists.

Areas that currently exceed the performance standards, but are expected to meet the alternative requirements in the future must develop an action plan. This plan must assess future impacts of motor vehicle traffic on multimodal travel, establish mitigation strategies, and establish a performance standard and monitoring system to implement the action plan.

Relevance to Medford

The City of Portland maintains a similar Level of Service “D” approach, but is selective as to what development review processes this standard is applied to. The City also provides alternative performance measures, largely based on increasing modal splits or development/monitoring of action plans, where this standard cannot be met.

City of Bend Performance Measures

The City of Bend performance measures are intersection based, and vary by intersection control type. All operational analysis within the City of Bend is focused on the overall hour, though the City experiences sharp peaking characteristics around 5:00 p.m. A summary of performance measure by control type is provided below:

- Two-way stop-controlled intersections: The City of Bend does not have a performance standard for low-volume intersections. At stop-controlled intersections serving more than 100 peak hour trips on the minor (stop-controlled) approach the City requires that the approach operate better than Level of Service “F” (less than 50 seconds of delay).
- All-way stop-controlled intersections require that the overall average delay is less than 80 seconds (Level of Service “E” or better).
- The analysis of roundabouts is conducted based on the overall intersection, and requires that it operate below capacity (v/c ratio less than 1.0).
- Signalized intersections are required to operate with a v/c ratio of less than 1.0 (below capacity). Intersections that are located within historic areas, or built-out to its master-planned size must operate with a v/c ratio of less than 1.0 during the hour preceding or following the peak hour.

In addition to these standards, the City of Bend has a concurrency requirement to ensure transportation facilities are provided when needed. The City also contains a pro-rata contribution requirement, which allows the City to collect fees toward intersections that are currently operating acceptably where master-planned improvements are not in place. The pro-rata system is intended to avoid the “last man in” construct where the developer that exceeds the performance measure is required to pay the entire mitigation costs.

The City of Bend actively considers intersection safety in its mitigation needs. The City requires that intersection crash records be reviewed at all intersections, and actively enforces sight distance and clear zone requirements. The City places a high emphasis on pedestrian, transit, and bicycle connectivity during the site plan review phase of development projects, and actively looks to limit individual or direct property access where feasible.

Relevance to the City of Medford

The City of Medford's performance standard is based on the peak 15-minute period and applies universally to all control types. As delay is defined differently for various control forms, Medford's Level of Service "D" standard applies a more conservative requirement to minor stop-controlled intersections, where infrastructure improvements may be undesirable or unnecessary. The City of Bend assesses all of its intersections during the peak hour (rather than fifteen-minute period) and generally accepts all operations short of failure.

City of Vancouver, Washington Performance Measures

The City of Vancouver contains performance measures along with a concurrency requirement, similar to the City of Medford. The intersection performance measures are separated by intersection control type, distinguish between fully built-out areas (with an adopted corridor management plan), and provide exceptions to the adopted standards when significant safety hazards would be created or worsened with a proposed development.

The City performance standards, as identified in Vancouver Municipal Code Section 11.90.020(e)(2) are as follows:

- Signalized intersections must operate better than LOS "F"
- Signalized intersections at LOS "E" must have a v/c ratio less than 0.95.
- Unsignalized intersections must operate with a v/c ratio of less than 0.95 on any lane/approach.

Concurrency, defined as provision of adequate transportation facilities to serve demand, is measured by the City in terms of corridor travel speeds along the City's defined concurrency corridors. These corridors are comprised of City-managed arterials, which are further divided into smaller segments. Concurrency modeling is completed periodically by the City, and is based on traffic counts, expected regional growth, and trip information submitted by development projects. Corridor operating speeds are calculated using posted operating speeds, with travel times supplemented with signalized intersection delays. Corridor targets in the City range between 10 and 15 miles per hour, varying by roadway and by the individual segments.

When corridor service level deficiencies occur, pro-rata fees, minor intersection improvements, or capital improvement projects are identified for mitigation. These improvements supplement Transportation System Development Charges (Traffic Impact Fees in Vancouver) and other mitigation that may be needed.

Relevance to the City of Medford

The City of Vancouver distinguishes between intersection control types and generally accepts operations short of intersection failure. The City's concurrency process, while adding a degree of

difficulty to manage and assess, also includes a review of corridor travel speeds. The use of pro-rata fees to fund major infrastructure needs that are beyond the scope of a single developer helps the City maintain its concurrency policies while avoiding development moratoriums.

Downtown Vancouver Trip Reduction

The City of Vancouver downtown trip reduction methodology was an effort to refine the City's concurrency policies within their downtown. Growth within the area, and application of suburban trip generation rates was conflicting with the City's urbanization and density goals, while over-projecting traffic impacts. This analysis considered area-wide factors, mixed-use factors, and transportation demand management programs.

Area Factors

To calibrate the standard trip generation rates, which are based on drive-alone trends, information was obtained from census data within the affected downtown block groups, and compared to citywide census data to provide a relative comparison. This showed those living within the downtown made 10.7 percent fewer drive-alone commute trips, 68 percent more transit commute trips, and 3.8 times as many walking or bicycling commute trips. Overall, this showed approximately 20 percent fewer driving trips to the downtown than would be estimated using standard trip generation rates.

Mixed-Use Development

The location of various uses within close proximity results in interaction between uses, and within a downtown environment these trips are increasingly by walking or bicycling. The Vancouver methodology recommended internal reductions within the downtown area based on the methodologies and information compiled through National Cooperative Highway Research Program (NCHRP) 8-51. The project methodology avoids duplication of the area-wide adjustments in this process.

Transportation Demand Management

Florida Department of Transportation (FDOT) and the Environmental Protection Agency (EPA) have developed models to predict the level of automobile trip reductions through various combinations of Transportation Demand Management (TDM) strategies. These agencies created spreadsheet models to simplify this process. Through testing the EPA model (COMMUTER) was found most responsive to a wide range of program measures, and allowed testing of a range of typical to exemplary measures.

Taken as a whole, these three elements would allow development of the downtown to more realistically assess its impacts within the surrounding context, and would provide options for development to invest in TDM program elements in lieu of infrastructure improvements.

Relevance to the City of Medford

The outcome of this project resulted in a white paper and a spreadsheet calculator for City demonstration purposes and has not been adopted. However, the idea of calibrating travel patterns (particularly in Transit Oriented Development or within the downtown area) can be used to encourage density, more realistically reflect impacts (which can further reduce conflicts with the City's performance/concurrency requirements), or allow investment in demand management programs, infrastructure, or strategies.

CITY OF MEDFORD PERFORMANCE MEASURE RECOMMENDATIONS

Based on review of performance standards in other urban communities it is recommended that the City of Medford performance standards be revised to incorporate the following:

- Distinguish between intersection control types to reflect the changes in how level of service is defined for these different intersection types. Consider a system such as that within the City of Bend where low-volume unsignalized intersections may not have a specific standard (or include a standard that ensures secondary/parallel access routes and safety review).
- Distinguish between built-out and developing areas. Require higher reserve capacity in new areas, or areas built below the ultimate facility plans, and increased emphasis on parallel routes or multi-modal improvements in built environments.
- Implement a specific safety review/mitigation requirement. This will ensure that additional congestion is not creating an unsafe environment.
- Consider an hourly analysis versus a fifteen-minute peak. This will avoid infrastructure investments for temporary conditions that can be more readily planned around.
- Incorporate intersection capacity within the City performance measures. Capacity refers to the physical ability of an intersection to process travelers, whereas level of service refers to the delays that are experienced. Both measures are readily available from the same analysis software without additional effort.

In addition to the measures above that describe the framework of how the City assesses adequacy, further testing will be needed to assess whether Level of Service "D" is an appropriate standard. Acceptance of Level of Service "E" is likely needed in more developed urban areas, whereas Level of Service "D" can remain for construction projects or within developing areas.

Exhibit B

Following review and discussion with City of Medford and ODOT staff, this memorandum will be incorporated into Technical Memorandum #4, with additional testing of the recommended performance measures. Please let us know if you have any questions or comments regarding this qualitative comparison of UGB scenarios.

Chapter 4.7

TRANSPORTATION ANALYSIS Revised 6/16 Revised 12/16 Revised 5/17

Sections:

- 4.7.100 Purpose.** Revised 6/16 Revised 12/16
- 4.7.200 Authority.** Revised 6/16
- 4.7.300 Process.** Revised 6/16 Revised 5/17
- 4.7.400 Transportation Facilities Report.** Revised 6/16 Revised 12/16 Revised 5/17
- 4.7.500 Transportation Impact Analysis.** Revised 6/16 Revised 12/16
- 4.7.600 Significant Impacts and Mitigation Measures.** Revised 6/16 Revised 5/17
- 4.7.700 Proportionate Share Contribution.** Revised 6/16

Prior legislation: Ord. NS-2016.

4.7.100 Purpose. Revised 6/16 Revised 12/16

The City will review new development to ensure the transportation system provides for:

- Consistency with the Bend Comprehensive Plan.
- Orderly construction of the Bend Urban Area Transportation System Plan network of streets and walking, biking and transit facilities.
- Safety and operations.

Therefore, the City requires applicants to complete an assessment of the transportation system within the study area of the development for adequacy to serve the new development and to assess the impacts of the development on the nearby transportation system. The City will use these assessments to ensure safety and operations of the transportation system are met for vehicle, biking, walking and transit and may impose reasonable conditions and mitigation requirements on development in proportion to its impacts. [Ord. NS-2271, 2016; Ord. NS-2263, 2016]

4.7.200 Authority. Revised 6/16

The City Engineer may modify or waive the required information upon written request by the applicant if, in the City Engineer's determination, the requested modification(s) or waiver(s) are consistent with the purpose and intent of this chapter. The written request must identify the special circumstances that apply to the particular situation and explain how this chapter's purpose and intent are still fulfilled without the required information.

The City Engineer may expand the transportation study requirements and/or study area to address existing operational issues and/or any issue identified after the initial approval of a scope of work. [Ord. NS-2263, 2016]

4.7.300 Process. Revised 6/16 Revised 5/17

A. The following steps describe the process for assessing the transportation system:

Step 1. The applicant must prepare and submit a Transportation Facilities Report in accordance to BDC 4.7.400 containing the following information organized as follows:

- a. Description of the development;
- b. Trip generation;
- c. Transportation and parking demand management (TPDM) plan;

- d. Major intersections;
- e. Trip distribution;
- f. Transportation facilities evaluation.

Step 2. The City Engineer will review and evaluate the Transportation Facilities Report in accordance to [BDC 4.7.400\(D\)](#) to determine if a Transportation Impact Analysis is required. If a Transportation Impact Analysis is not required, the applicant may submit a development application including the Transportation Facilities Report. If a Transportation Impact Analysis is required, see Step 3. Step 1 and Step 3 may be combined.

Step 3. If required after Step 2 or if the applicant chooses do so concurrently with Step 1, the applicant must prepare and submit a Transportation Impact Analysis in accordance with [BDC 4.7.500](#) containing the following information organized as follows:

- a. Study area;
- b. Study analysis years;
- c. Study time periods;
- d. Traffic counts;
- e. Future traffic forecasts;
- f. Operations analysis methodology;
- g. Arterial and collector left turn, median refuge, and right turn lane assessment;
- h. Safety review;
- i. Walking, biking and transit friendly developments;
- j. Proportionate share contribution.

Step 4. If no significant impacts are identified, the applicant may submit a development application including the Transportation Impact Analysis and may also have to pay a proportionate share contribution if required under [BDC 4.7.700](#), Proportionate Share Contribution. Development with significant impacts will be required to propose mitigation in compliance with [BDC 4.7.600](#), Significant Impacts and Mitigation Measures, as part of the development application and may also have to pay a proportionate share contribution if required under [BDC 4.7.700](#), Proportionate Share Contribution. If mitigation measures have been determined for any significant impacts, then the applicant must include the Transportation Impact Analysis with the mitigation measures identified as part of a development application. [Ord. NS-2289, 2017; Ord. NS-2263, 2016]

4.7.400 Transportation Facilities Report. [Revised 6/16](#) [Revised 12/16](#) [Revised 5/17](#)

A. Applicability. A Transportation Facilities Report will be required when a development involves one or more of the following:

- 1. Land division application;
- 2. Site Plan Review application;
- 3. Master Plan;
- 4. Bend Comprehensive Plan map amendment;

5. Other development proposals as determined by the City Engineer.

B. Preparation. The Transportation Facilities Report must be prepared by a licensed Professional Engineer especially qualified in civil or traffic engineering by the State of Oregon. It is the responsibility of the Engineer to provide enough detailed information for the City Engineer to determine if a Transportation Impact Analysis is required.

C. Contents of the Transportation Facilities Report.

1. Description of the Development. Provide a description of the development sufficient to understand the proposed development's size, uses, operations, and interaction with the transportation system. At a minimum, the description must include both qualitative and quantitative descriptions, such as scale of development, day-to-day operations, deliveries, staffing, customer base (visitors, patients, employees, students, etc.), peak hours of operation, and identification of site access and on-site circulation needs.

2. Trip Generation. Provide a trip generation description for the proposal with the following applicable information:

a. Trip Credits and Vested Trips. If trip credits are being utilized from the existing on-site development or from a separate development approval, the trip generation description shall provide supporting documentation of those trip credits, and documentation of the authority to use those trip credits for the development proposal.

b. Base Trip Generation Rates. The City Engineer will determine which of the following to use for the base trip generation rates:

i. Local data;

ii. Average trip generation rates from the latest edition of the publication Trip Generation by the Institute of Transportation Engineers (ITE); or

iii. Other method approved by the City.

The procedure for identifying local trip generation rates shall comply with the guidelines for "Conducting a Trip Generation Study" in the ITE Trip Generation document.

c. Bend Comprehensive Plan Amendments. For Bend Comprehensive Plan amendment applications, the trip generation shall represent a reasonable build-out scenario supported through citation of nearby existing site trip generation rates and densities in order to ensure reasonable trip generation comparisons. If the Bend Comprehensive Plan amendment is accompanied by a concurrent Site Plan Review application, the trip generation for the site plan review application may be utilized instead. The amendment must comply with the Transportation Planning Rule, OAR [660-012-0060](#).

d. Pass-by Trips. Adjustments for pass-by trips may be applied depending on the adjacent transportation facility and City Engineer approval. The published average pass-by rate will typically be allowed for those land use categories that are provided in the ITE Trip Generation publication. Pass-by trips must always be accounted for in the site access analyses and sufficiently documented. Pass-by trip maps must be created for each pass-by route separately rather than a single combined map.

e. Site Internalization/Trip Sharing. Demonstrate how the site reduces vehicle trips through site design, including parking supply, land use mixes, and densities that promote reduced rates based upon those elements. City review of the proposal based on guidance from the state's Transportation Planning Rule may result in trip generation reductions.

3. Transportation and Parking Demand Management (TPDM) Plan. In compliance with [BDC Chapter 4.5](#), Master Planning and Development Alternatives, institutional and employment master plans must develop a TPDM plan. All other development applications may choose to develop a TPDM plan. The proposed measures of the TPDM plan will be evaluated to determine trip generation reduction rates. See [BDC Chapter 4.8](#), Transportation and Parking Demand Management (TPDM) Plan.
4. Major Intersections. From each access point (driveway or street) of the development onto and along the transportation system for a distance of one mile, identify the major (collector and arterial) intersections on a map.
5. Trip Distribution. Provide a trip distribution description and map that contains the following information:
 - a. Trip distribution assignments that replicate overall origin/destination patterns, including the major intersections identified in subsection (C)(4) of this section. Existing field count turning movement patterns are to be used as a guide for trip assignments as appropriate. The assignment should be adjusted to reflect future funded transportation facilities, improvements or services that are authorized in the Transportation System Plan and for which funding is in the City's approved Capital Improvements Program (CIP), the Statewide Transportation Improvement Program (STIP) or other approved funding plan.
 - b. Description of truck delivery routes, including over-dimensional loads if applicable, of travel to and from the site for a distance of one mile. The distance may be extended to identify freight routes for freight-intensive sites or those that generate over-dimensional loads.
6. Transportation Facilities Evaluation. The report must evaluate and document the following for compliance with this code, the Transportation System Plan and the City of Bend Standards and Specifications:
 - a. The existing transportation system infrastructure serving the site within the study area. The evaluation must include any future funded transportation system elements included in the City's approved five-year Capital Improvement Program, Statewide Transportation Improvement Program or other approved funding plan.
 - b. The following right-of-way information along the frontage of the proposed development:
 - i. Compliance with the required right-of-way width for the roadway classification.
 - ii. Compliance with the required street widths.
 - iii. Compliance with the required right-of-way or easement width for all trail and access corridors.
 - iv. Compliance with the required street frontage elements including curbs, bike facilities, park strips, sidewalks, driveways and driveway aprons, as well as curb ramps. All applicable elements shall be accessible per the City of Bend Standards and Specifications.
 - c. The following access information:
 - i. Legal access and recorded easements for all driveway and access systems serving the site. For all driveways and new intersections created by the development, intersection sight distance measurements must be provided for all movements into and out of the proposed accesses. Field measurements should be used wherever possible, although plan measurements from civil drawings may be utilized, particularly for planned intersections or driveways. Measurements need to account for vertical and horizontal curvature, grades, landscaping, and right-of-way limitations. Sight

Exhibit C

- distance measurements shall comply with City of Bend Standards and Specifications for the posted speed of the road or as approved by the City Engineer.
- ii. For arterial and collector street accesses and new street connections document the location of all existing driveways and street connecting points within 300 feet of the frontage of the property. Provide a driveway conflicting movement diagram and assessment showing overlapping conflicts with nearby existing driveways and street intersections.
- d. The following on-site circulation and/or street plan access information:
- i. The proposed street layout and determine if it matches the Transportation System Plan and if it matches into abutting and nearby approved development street layouts, abutting and nearby master plans or special planned areas and requirements of this code and provides for logical orderly development of adjoining properties.
 - ii. Truck circulation and entry/egress assessment including routing, turning movement, and delivery needs for all truck and emergency service vehicles. Identify any proposed special truck accommodations for freight service.
 - iii. Necessary public access, shared access, and shared parking easements are in place or will be required to be in place.
- e. The following existing and planned walking, biking and transit facilities and infrastructure serving the site from each access point (driveway or street) of the proposed development onto and along the transportation system for a distance of one-quarter mile:
- i. Location of all sidewalks, curb ramps, bike lanes, paths, crosswalks, pedestrian signal heads, push buttons, related signage, striping, and transit facilities along with pedestrian paths of travel between the transit facility and the site and to the buildings on the site.
 - ii. Barriers, deficiencies and high-pedestrian demand land uses including schools, parks, parking, senior housing facilities, and transit facilities.
- f. Truck circulation and entry/egress including routing, turning movement, and delivery needs for all truck and emergency service vehicles. Identify any proposed special truck accommodations for freight service.
- D. City Review and Evaluation.
1. If it is determined that any of the infrastructure or facilities are missing or substandard as identified in the Transportation Facilities Report, then the applicant will be required to comply with [BDC Title 3](#), Design Standards, and with the City of Bend Standards and Specifications.
 2. Based on information provided in the Transportation Facilities Report, the City Engineer will notify the applicant in writing if the Report is complete, and if not, what additional evaluation information is required. If no additional information is needed, the City Engineer will notify the applicant whether a Transportation Impact Analysis is required. The City Engineer will determine if a Transportation Impact Analysis is required by considering the following criteria:
 - a. Operations.
 - i. Poor roadway configuration and/or alignment, or capacity deficiencies that are likely to be compounded as a result of the proposed development;

Exhibit C.

- ii. Proposed street design creates inadequate circulation and does not minimize cut-through traffic or accommodate orderly development of adjacent properties;
 - iii. It is anticipated that the current or projected increase in trip generation of the roadway system in the vicinity of the proposed development will exceed the minimum operational criteria in BDC 4.7.500(B)(6); and
 - iv. Potential improvements to accommodate freight.
- b. Safety.
- i. Existing safety issues;
 - ii. Projected increase in trip generation that may have the potential to impact the safety of the existing transportation system; and
 - iii. A traffic safety hazard is created or exacerbated on any street, roadway segment, or intersection within the study area as a direct result of the proposed development.
- c. Walking, Biking and Transit Facilities.
- i. Potential impacts to priority walking and biking routes, school routes, transit connectivity and multimodal street improvements identified in the Transportation System Plan;
 - ii. Bike access to site has gaps and/or the bike lane is dropped, missing, or otherwise unusable; and
 - iii. Identified transit facilities and/or their pedestrian paths of travel between the transit facility and the site and to the buildings on site are not complete and additional analysis may be required.
3. In all instances, a Transportation Impact Analysis must be submitted for any proposed development that:
- a. Considers modification, installation, or removal of any traffic control device; or
 - b. Forecasts net increase in site traffic volumes greater than 100 average daily vehicle trips or off-site major intersections are impacted by 15 or more peak-hour vehicle trips per lane group within one mile. [Ord. NS-2289, 2017; Ord. NS-2271, 2016; Ord. NS-2263, 2016]

4.7.500 Transportation Impact Analysis. Revised 6/16 Revised 12/16

A. Preparation. If the City Engineer determines that a Transportation Impact Analysis is required, it must be prepared by a licensed professional engineer especially qualified in traffic engineering by the state of Oregon. The applicant's engineer shall consult with the City Engineer prior to preparing the Transportation Impact Analysis to determine the level of details to be included in the analysis.

B. Contents of the Transportation Impact Analysis Report.

- 1. Study Area. The study area must include all site access and adjacent roadways and intersections. The study area must also include all off-site major intersections impacted by 15 or more peak-hour vehicle trips per lane group within one mile of the site. The City Engineer must approve the defined study area prior to commencement of the Transportation Impact Analysis. The City Engineer may choose to waive the study of certain intersections if deemed unnecessary.

2. Study Analysis Years. The analysis shall be performed for all study roadways and intersections for the following years with and without the proposed development:
 - a. Existing conditions (current year);
 - b. Year of completion of the final phase (for phased projects, intermediate phases may be required to be analyzed); and
 - c. For an amendment to a functional plan, the Bend Comprehensive Plan, or a land use regulation the analysis year shall reflect the Transportation Planning Rule OAR 660-012-0060 requirements but in no case shall the analysis year be less than 10 years from the date of the preparation of the Transportation Impact Analysis. An analysis for an amendment to a functional plan, the Bend Comprehensive Plan or land use regulation must use the City of Bend's model as determined by the City Engineer.
3. Study Time Periods. Within each study year, an analysis must be performed for the following time periods:
 - a. Weekday p.m. peak hour (i.e., one hour between 4:00 p.m. and 6:00 p.m.); and
 - b. Additional time periods may be required based on City Engineer direction for the following:
 - i. Peak hour of the generator (i.e., peak hour for the proposed development);
 - ii. Peak hour of nearby generator sites (e.g., a non-school site may study a nearby school's peak hour); and
 - iii. Peak hour of cumulative nearby generators.
4. Traffic Counts. Once the study periods have been determined traffic counts must be done as follows:
 - a. Counts must be taken Tuesday through Thursday;
 - b. Counts may need to be adjusted as required by the City Engineer to reflect seasonal, schools, or other variations in traffic;
 - c. Unless approved by the City Engineer, counts must be no more than 12 months old from the date of development application submittal;
 - d. Additional hours of classified turning movement counts may be required based on City Engineer direction for the following:
 - i. To determine compliance with traffic signal or all-way stop warrants; or
 - ii. To determine the extent of over-capacity conditions.
 - e. Counts must include passenger cars, trucks, bikes and pedestrians. If high pedestrian and/or bike traffic is expected to be generated by the proposed development, as determined by the City Engineer, the Transportation Impact Analysis must consider improvements and connectivity to existing and proposed facilities.
5. Future Traffic Forecasts.
 - a. Traffic Forecast for Projects and Project Phasing.
 - i. Traffic forecast shall include all projects within the study area that have received approvals for development (master plans, land divisions, site plans, conditional use permits, and similar

Exhibit C

- approvals). They shall be identified, and their traffic generation included as cumulative traffic in the study. Proposed projects in the study area that have been submitted to the City for processing, but not yet approved, may also be included at the discretion of the City Engineer. The City Engineer will also specify an annual growth rate to be applied to existing volumes to account for other general traffic growth in and around the study area.
- ii. For phased developments, the traffic forecasts for the year of completion of each phase shall be calculated to be field counts plus traffic from projects within the study area that have received approvals for development (approved master plans, land divisions, site plans, conditional use permits, and similar approvals), plus an annual growth factor which would factor the existing counts up to the analysis year.
- b. Build-Out Studies for Bend Comprehensive Plan Amendments and Zone Changes.
 - i. Traffic projections for build-out scenarios must utilize the current transportation model used by the City or other approved model as approved by the City Engineer. The applicant's Engineer shall use the model projections post processed using NCHRP 255 as the basis for determining turning-movement volumes for the required intersection analysis. A manual assignment of the project traffic added to the build-out traffic may typically be used to determine total future traffic, as approved by the City Engineer.
6. Operations Analysis Methodology.
- a. The operations analysis must include the following:
 - i. Software inputs must utilize field conditions (e.g., measured field peak hour factor, saturation flow rates, lane utilization percentages, lane configurations, actual signal phasing and timing, and truck percentages). Other references and the City of Bend Standards and Specifications may be required to be utilized as approved by the City Engineer;
 - ii. An operations analysis for roundabouts performed in conformance with the City's Roundabout Operational Analysis Guidelines;
 - iii. An operations analysis for traffic signal and stop controlled intersections performed in conformance with the most recent version of the Highway Capacity Manual (HCM), the City of Bend Standards and Specifications or other reference approved by the City Engineer;
 - iv. Identify intersection operations in a table including volume to capacity ratios, delay, and queuing for critical movements as well as for the intersection as a whole including the following:
 - (A) Delays for two-way and four-way stop controlled study intersections including delays for lane groups, approaches, and intersections as a whole;
 - (B) Ninety-fifth percentile queue projected to block nearby critical system elements such as adjacent traffic signals, roundabouts, or at-grade rail crossings, or such that line of sight safety issues are identifiable; and
 - (C) Volume to capacity ratio for any approach or for the intersection as a whole for signalized and roundabout controlled study intersections.
 - v. Microsimulation modeling and analysis using a calibrated model for the transportation corridor as defined must be performed for interconnected traffic signals. Calibration must include field

Exhibit C

measured saturation flow rates, existing timing and phasing rotations, peak hour factors, available queue storage and queuing; and

b. The operations analysis must use existing transportation system conditions (intersection control type and street roadway geometry). Committed funded transportation facilities may also be considered in the analyses. Committed funded transportation facilities means future funded transportation facilities, improvements or services that are authorized in a local transportation system plan and for which funding is in the approved Capital Improvements Program (CIP), the Statewide Transportation Improvement Program (STIP) or other approved funding plan.

c. Operations Standards. The intersection analyses provided in the Transportation Impact Analysis will be evaluated for safety deficiencies and queuing deficiencies and compliance with this code, the Transportation Planning Rule, the Bend Urban Area Transportation System Plan, any applicable development agreements, and regional transportation system plans. Intersections under the jurisdiction of the Oregon Department of Transportation shall also be evaluated using the ODOT Analysis Procedures Manual for compliance with the Oregon Highway Plan. Intersections under the jurisdiction of Deschutes County that are outside the Urban Growth Boundary shall also be evaluated for compliance with Deschutes County Code. Intersections that do not comply with the criteria listed in those documents will be considered to have significant impacts for purposes of [BDC 4.7.600](#).

d. Projects are considered to have significant impacts on the arterial-collector system for purposes of [BDC 4.7.600](#) as identified below:

i. Two-Way Stop Control. Average delay for the critical lane group for approaches of an arterial or collector to another arterial or collector with greater than 100 peak hour trips is greater than or equal to 50 seconds during the peak hour;

ii. All-Way Stop Control. Average delay for the collector to collector and higher order intersection as a whole is greater than or equal to 80 seconds during the peak hour;

iii. If the ninety-fifth percentile queue exceeds the existing available storage or is projected to block nearby critical system elements such as adjacent traffic signals, roundabouts, or at-grade rail crossings, or such that line of sight safety issues are identifiable; or

iv. For signalized and roundabout collector to collector and higher order intersections under the jurisdiction of the City, the volume-to-capacity ratio for the intersection as a whole is greater than or equal to 1.0 during the peak hour.

e. Intersections under ODOT Jurisdiction.

i. In addition to the City operations standards, intersections on ODOT facilities will also be required to comply with ODOT mobility targets. Coordination with ODOT is required in the study process.

7. Arterial and Collector Left Turn, Median Refuge, and Right Turn Lane Assessment. Meeting the following criteria does not automatically require a pedestrian refuge or a turn lane to be installed. The City Engineer has the final determination during the review of proposed mitigation on the installation of a pedestrian refuge or a turn lane based on safety and operations of the system.

a. A median refuge assessment and a left and right turn lane assessment on arterial and collector streets must include the following information:

Exhibit C

- i. An assessment using Table 11 of the Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations Final Report and Recommended Guidelines (FHWA Publication Number HRT-04-100, September, 2005);
 - ii. An assessment using the Left and Right Turn Lane Criteria in the ODOT Analysis Procedures Manual (APM); and
 - iii. Provide the ninety-fifth percentile queue length for left, right and through turning vehicles.
 - b. Projects are considered to have significant impacts for purposes of [BDC 4.7.600](#) if Table 11 of the Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations Final Report and Recommended Guidelines identifies a candidate site(s) for the installation of a marked crosswalk or other needed pedestrian improvements at uncontrolled locations.
 - c. If the proposed development meets the criteria in the APM or exceeds the ninety-fifth percentile queue length for left or right turning vehicles, then the City Engineer has the final determination whether it is a significant impact for purposes of [BDC 4.7.600](#).
8. Safety Review.
- a. For the study area or those locations required by the City Engineer, document and review crash data from the ODOT Crash Analysis and Reporting Section (ODOT-CARS). Crash data can be requested directly from ODOT or the Bend Urban Area Metropolitan Planning Organization. Crash data must provide a five-year history of ODOT reported crashes and must be presented in tabular and crash diagram form. Crash data must include the following information:
 - i. Crash histories and a calculated crash rate;
 - ii. Crash patterns (was there an identifiable pattern to the crashes), crash types, and crash patterns affecting proposed development trips; and
 - iii. Whether any location within the study area is included within published safety studies, such as the Oregon Department of Transportation Safety Priority Index System lists, ODOT Safety Action Plan, or the City's Arterial and Collector Multimodal Safety Study.
 - b. Projects are considered to have significant impacts for purposes of [BDC 4.7.600](#) if there is a crash pattern, one or more fatalities or severe injury crashes, one or more reported crashes per 1,000,000 entering vehicles, or if it is included within a published safety study.
9. Walking, Biking and Transit Friendly Developments.
- a. Public and Private Schools (K-12), Colleges and Universities. Provide an analysis of walking, biking and transit facilities along and across arterial and collector roadways which accommodate safe, accessible and convenient access to and from the school. Elementary schools shall analyze the facilities within one mile of the school. All other schools, colleges and universities shall analyze the facilities within 1.5 miles of the school.
 - b. All Other Uses. Provide an analysis of walking, biking and transit facilities, including street crossings and access ways, which accommodate safe, accessible and convenient access from within new residential areas, planned developments, shopping centers, and commercial districts and residential areas, parks, shopping centers and transit facilities within one-quarter of a mile of the development. Residential developments must also provide the analysis to elementary schools within one mile and all other schools, colleges and universities within 1.5 miles of the development.

Exhibit C

C. Projects are considered to have significant impacts for purposes of BDC 4.7.600 if:

- i. A project fails to provide accessible and safe pedestrian and bike connections (i.e., curb extensions, pedestrian refuges, striping and/or signage) to schools, residential areas, parks, shopping areas, transit facilities and adjacent streets; or
- ii. The project disrupts existing or planned biking or walking facilities or conflicts with the adopted Bend Urban Area Bicycle and Pedestrian System Plan.

10. Proportionate Share Contribution. Provided proportionate share calculations in compliance with BDC 4.7.700, Proportionate Share Contribution. [Ord. NS-2271, 2016; Ord. NS-2263, 2016]

4.7.600 Significant Impacts and Mitigation Measures. Revised 6/16 Revised 5/17

A. Applicability. When significant impacts are identified as part of the Transportation Impact Analysis, mitigation measures must be included to address those impacts.

B. Preparation. Prior to proposing mitigation, the applicant's engineer shall consult with the City Engineer regarding potential mitigation options. The proposed mitigation and a concept-level drawing of the final intersection form must be prepared and submitted prior to a development application being deemed complete, unless approved otherwise by the City Engineer. Mitigation measures may be proposed by the applicant or recommended by ODOT or Deschutes County in circumstances where a state or county facility will be impacted by a proposed development. Deschutes County and/or ODOT must be consulted to determine if improvements proposed for their facilities comply with their standards and are supported by the respective agencies.

C. Intersection Operation Standards. If the Transportation Impact Analysis shows that the operation standards at the intersection will be exceeded or if the intersection already exceeds the standards, the applicant will be required to provide mitigation measures in compliance with subsection (F) of this section impacts.

D. Unique Situations.

1. Development proposals within Master Planned Developments or Special Planned Areas, as described in BDC Chapter 4.5, Master Planning and Development Alternatives, where a Transportation Mitigation Plan has been approved, may exceed the operation standards at affected intersections as long as the proposed development is consistent with the approved Transportation Mitigation Plan.

2. Widening to accommodate additional travel lanes will not be permitted in the following situations:

- a. Intersections and streets that are already constructed consistent with the Bend Urban Area Transportation System Plan (TSP) including streets identified by the TSP as "not being authorized for lane expansion";
- b. Intersections and streets located within or directly adjoining the City's Central Business District or historic district;
- c. Where no physical mitigation is available to improve intersection operations to the performance standard; or
- d. Where improvements may result in unacceptable tradeoffs to other modes of travel.

E. Timing of Improvements.

1. Unless a unique situation is identified in subsection (D) of this section, Unique Situations, mitigation shall be in place at the time of final platting of a land division, or at the time of final occupancy for

Exhibit C

commercial, industrial, institutional, mixed use, multi-family housing, triplex buildings and all other development. Mitigation for phased developments must be in place at the time specified in the approved decision.

Exception: Construction of emergency services access requirements may be needed earlier.

2. Development proposals within Master Planned Developments or Special Planned Areas, as described in [BDC Chapter 4.5](#), Master Planning and Development Alternatives, where a Transportation Mitigation Plan has been approved, shall refer to the Plan for the extent and timing of improvements.

F. Mitigation Measures. Mitigation measures must consider all users and include all or a combination of the following mitigation measures as approved at the discretion of the City Engineer, to mitigate the impacts of the proposed development:

1. Construct Transportation Mitigation.

a. The intersection form will be determined through the City's Intersection Form Evaluation Framework located in the City's Roundabout Evaluation and Design Guidelines document.

b. Mitigation must include the construction of the full intersection infrastructure and control required to bring the intersection into compliance with this code, the Bend Urban Area Transportation System Plan, and the City of Bend Standards and Specifications. Final intersection improvements, including type and geometry, will be determined by the City Engineer.

c. Intersection improvements must improve corridor operations in terms of progression and reduced corridor delay, and must be shown to cause no significant adverse impact to the corridor during integrated corridor operations.

d. Mitigation in the form of street widening must be constructed in conformance with the street classification of the Bend Urban Area Transportation System Plan and the cross-sections contained in this code or the City of Bend Standards and Specifications. As part of the development review process, the City Engineer may approve an alternate cross section if it meets operations standards.

e. Intersection and street improvements must balance operations and safety for all modes of travel. Walking and biking accommodations must be considered as part of any improvement.

2. Construct Interim Transportation Mitigation.

a. Construct Interim Mitigations. Interim mitigation measures may include but are not limited to upgraded operations controls, interconnected signals, signage, striping, pedestrian refuge, etc.

b. Improved signal timing and phasing may be achieved by installing the necessary communications and field equipment that would provide the increased capacity necessary to achieve the operation standards. For this to be acceptable as an interim measure, the applicant shall demonstrate through a field calibrated corridor operations model approved by the City Engineer that the proposed signal timing and phasing will provide the additional capacity necessary to meet the concurrency standards. Timing and phasing communications and field equipment are subject to approval of the City Engineer and/or ODOT.

3. Transportation and Parking Demand Management (TPDM) Plan. Implement an approved TPDM plan in compliance with [BDC 4.7.400\(C\)\(3\)](#), Transportation and Parking Demand Management (TPDM) Plan, and [BDC Chapter 4.8](#), Transportation and Parking Demand Management (TPDM) Plan.

Exhibit C

4. Walking, Biking and Transit. In addition to accommodating walking and biking as part of the intersection and street improvement mitigation, walking, biking and transit improvements may be considered as potential mitigation measures, particularly when they reduce the number of study area generated vehicle trips. Mitigation improvements may include accessible sidewalks, pedestrian refuges, bike lanes, curb extensions, traffic control devices, curb ramps, striping, signage and other elements. Negative impacts of intersection and street mitigation measures on walking and biking infrastructure, such as on crosswalks and roadway shoulders, must be avoided, minimized, and/or mitigated themselves. The City may require accessibility improvements, including compliant curb ramps along the proposed development and including safe and accessible paths of travel to and from the development, depending on the type and impacts of the development.

5. Payment in Lieu of Construction. If infrastructure construction is required above, the City may elect to accept a payment in an amount equal to the cost estimated by the City for the design, right-of-way acquisition, utility relocation and construction cost of the improvements in lieu of actual construction. The City will use these funds on the impacted corridor to improve multi-modal safety, operations and to relieve congestion. Once the City accepts a payment in lieu of construction, the proposed development may proceed even if the impact of the proposed development causes the operation standards to be exceeded.

6. Alternate Location Mitigation. Mitigation strategies at alternative locations or affecting alternative modes of travel may be proposed by the applicant and may be accepted by the City Engineer. At a minimum, the proposed improvements should meet the following criteria:
 - a. The overall improvements proposed should be proportional to the impacts created by the application;
 - b. The proposed improvement strategies must address a critical need or issue within the study area such as safety, connectivity, system capacity, and parallel routes;
 - c. The locations proposed for improvement must be within the study area;
 - d. The proposed improvements must not already be, or be in the process of being, a condition of approval of another development; and
 - e. All applicable analysis requirements for the primary location(s) shall apply to the analysis of the alternative location(s).

7. Suspend the Mobility Standard. The City Manager may suspend the mobility standard for a particular intersection or series of intersections under the City's jurisdiction when the intersection(s) may be in a condition that interim mitigation is not practical due to the large scale of the improvements or the City desires to maintain the current intersection's form. In such cases, developments impacting the intersection(s) do not have to analyze or mitigate impacts on the intersection(s). The City Manager will issue a written statement providing the duration and reason for the suspension of the mobility standard, and will maintain a list of all intersections where the mobility standard has been suspended. Suspending the mobility standard is not a limited land use decision or a land use decision. [Ord. NS-2289, 2017; Ord. NS-2263, 2016]

4.7.700 Proportionate Share Contribution. [Revised 6/16](#)

Each proposed development that submits a Transportation Impact Analysis will be required to contribute a proportionate share of the costs of the final improvements to the transportation system that will be required as a result of the cumulative impact that various developments combined will have on the intersections.

Developments must contribute their proportionate share or contribution for all intersections within the analysis area.

The City may use the proportionate share contributions for multi-modal improvements on the transportation corridor and surrounding system if the improvement project benefits safety and operations and helps to reduce congestion.

Proportionate share calculations must be submitted with the Transportation Impact Analysis. Proportionate share calculations are calculated based on the ratio of development trips to growth trips for the anticipated cost of the full Bend Urban Area Transportation System Plan intersection infrastructure. The formula is provided below:

$$\text{Proportionate Share Contribution} = \frac{[\text{Net New Trips} / (\text{Planning Period Trips} - \text{Existing Trips})] \times \text{Estimated Construction Cost}}$$

Net new trips are the total entering trips that are proposed to be added to the analysis area intersection by the development.

Exception: Intersections within the analysis area that are included in the City's Capital Improvement Plan or that are on the most current System Development Charge (SDC) fiscally constrained project list are exempt from proportionate share contribution. [Ord. NS-2263, 2016]

The Bend Code is current through Ordinance NS-2294, passed August 2, 2017.

Disclaimer: The City Recorder's Office has the official version of the Bend Code. Users should contact the City Recorder's Office for ordinances passed subsequent to the ordinance cited above.



Protected Bike Lane



A protected bike lane, sometimes called a “cycle track”, is an exclusive bicycle facility adjacent to, but separated from, the roadway. Separation is generally achieved using planters, parked cars, curbs, or posts to separate people biking from people driving. They are best on roads with few cross streets and driveways, particularly on roadways with high auto volumes and speeds. A protected bike lane provides a logical extension of a shared use path because it provides the sensation of riding on a path due to the separation from motorized traffic.

Grade Separated Crossings



A grade separated crossing occurs where an at-grade crossing is unsafe, such as crossing an interstate highway, or not practical. Grade separation in an urban context generally means that a facility for walking or bicycling is constructed below or above an existing roadway. Bridges across waterways are also considered grade separated crossings in Eugene.

Vehicular Performance Measurement

The City uses motor vehicle level of service (LOS) standards to evaluate acceptable vehicular performance on the City’s local, collector and arterial streets. LOS standards are presented as grades A (free flow traffic conditions) to F (congested traffic conditions). ODOT uses mobility targets based on volume to capacity (V/C) ratios to evaluate acceptable vehicular performance on state facilities. As V/C ratios approach 1.0, traffic congestion increases.

These standards and targets are used to:

- Identify vehicular capacity deficiencies on the roadway system;
- Evaluate the effects of amendments to transportation plans, acknowledged comprehensive plans and land-use regulations pursuant to the Transportation Planning Rule (TPR; Oregon Administrative Rules [OAR] 660-12-0060) on the city and state roadways;
- Evaluate the traffic impacts of development applications for consistency with the land-use regulations.

In some cases, it may not be possible or desirable to meet the designated mobility target or LOS standard. In those cases, an alternative mix of strategies such as land use, transportation demand management, safety improvements or increased use of active modes may be applied.



The use of mobility standards for roadways identifies the maximum amount of congestion that an agency has deemed to be acceptable. Such standards are commonly used to assess the impacts of proposed land use actions on vehicular operating conditions and are one measure staff uses to determine transportation improvement needs for project planning. Mobility standards are typically expressed as Volume-to-Capacity (V/C) Ratios and/or Level of Service (LOS), which are defined below.

- V/C** represents a facility’s level of saturation (i.e., what proportion of capacity is being used), with values ranging from 0.01 to 1.00. A lower ratio indicates smooth vehicular operations and minimal delays. As the ratio approaches 1.00, congestion and vehicular delays increase. At a ratio of 1.00, the intersection, travel lane, or automotive movement is saturated resulting in longer queues and delays.
- LOS** is a performance measure that is similar to a “report card” rating based on average vehicle delay. LOS A, B, and C indicate conditions where traffic moves without significant delays. LOS D and E indicate progressively worse operating conditions and more delay. LOS F represents conditions where average vehicle delay has become excessive and demand is near capacity. This condition is typically evident by long queues and delays, with intersection delays that may be difficult to measure because congestion may extend into and be affected by adjacent intersections. The table shows the average delay value (in seconds) corresponding to each LOS designation.

LOS	Signalized Intersections	Unsignalized Intersections
A	≤10 sec	≤10 sec
B	10–20 sec	10–15 sec
C	20–35 sec	15–25 sec
D	35–55 sec	25–35 sec
E	55–80 sec	35–50 sec
F	>80 sec	>50 sec

Table 4.1 presents mobility targets and LOS standards to be applied in the City of Eugene. Because mobility targets from the Oregon Highway Plan (OHP) are applied on state facilities, the City will seek ODOT amendment of the OHP to include alternative mobility on the identified ODOT facilities. ODOT performance standards are reflected in Table 4.1 for city streets near highway interchanges; this interchange influence area is generally defined as one-quarter mile from a ramp terminal or as the area between the ramp terminal and the first public street intersection.

Table 4.1: City of Eugene Vehicular Performance Measures

Jurisdiction	Roadway	Standard (peak hour, unless noted)
City	Citywide (unless otherwise specified)	LOS E
City	Eugene Downtown Traffic Impact Analysis Exempt Area	LOS F
ODOT	Randy Papé Beltline/Highway 99 ramp termini	1.0 V/C
ODOT	Randy Papé Beltline/Roosevelt Boulevard intersection	1.0 V/C
ODOT	Highway 99/Roosevelt Boulevard intersection	1.0 V/C
ODOT	Highway 99 from Roosevelt Boulevard to 5th Avenue; 6th and 7th Avenues to Garfield Street	1.0 V/C
ODOT	6th Avenue/Garfield Street intersection	1.0 V/C
ODOT	6th Avenue/Madison Street intersection	1.0 V/C



Jurisdiction	Roadway	Standard (peak hour, unless noted)
ODOT	6th Avenue/Chambers Street intersection	1.0 V/C (2 hour)
ODOT	7th Avenue/Chambers Street intersection	1.0 V/C
ODOT	6th and 7th Avenues from Madison Street to Lincoln Street	1.0 V/C
ODOT	Randy Papé Beltline/W 11th Avenue intersection	1.0 V/C (2 hour)
ODOT	River Road from Irving Road to River Avenue (Randy Papé Beltline Highway interchange influence area)	1.0 V/C
ODOT	Delta Highway from Green Acres Road to Goodpasture Island Road	1.0 V/C
ODOT	Coburg Road from Chad Drive to Elysium Avenue (Randy Papé Beltline Highway interchange influence area)	1.0 V/C
ODOT	Franklin Boulevard from Walnut Street to I-5	1.0 V/C

Some of the intersection and corridor locations listed in Table 4.1 are part of ODOT’s Beltline Facility Plan and the related National Environmental Policy Act (NEPA) project. At the time the 2035 TSP was drafted, the Facility Plan was complete but the NEPA project had not commenced. The recommended target threshold for the affected intersections/corridors will be refined to reflect NEPA findings. The 2035 TSP recognizes the need to coordinate with these efforts and will be updated accordingly.

Truck Routes

Both the 2035 TSP and the *Oregon Transportation Plan* (OTP, 2006) recognize the important role that an efficient and reliable transportation system plays in supporting the region’s economy, growth, and quality of life. Within the Eugene-Springfield area, highways, city streets, airports, pipelines, and railways provide freight mobility. Trucks, rail, and air service must function together to ensure the efficient and timely movement of freight to, within, and through the community.

Discussions with the TCRG, TAC, Lane Area Commission on Transportation (Lane ACT), and other public stakeholders, identified a concern that freight movement would be hindered by delays in traffic congestion.

As part of the needs analysis, changes to the existing freight and truck routes were identified to ensure consistency with state and federal designations and guidance. One way in which this need is being address is an amendment to the Street Classification Map to change the classification of the Northwest Expressway (from the northern UGB to River Road) from a Minor Arterial to a Major Arterial. The 2035 TSP policies support technological and information systems that will make freight delivery times more reliable.

A map of the state highway freight system from the 1999 Oregon Highway Plan is provided as Attachment E, Figure 1, State Highway Freight System.



Medford because the rules provide mitigation options when approving land use regulations and zone changes.

PRESENTATION OUTLINE

Introduction and Presentation –

Carla Paladino, Transportation Planning Rule (TPR)

Discussion and Direction – Mayor and City Council

OVERVIEW

Transportation Planning (Statewide Goal 12)

The Oregon Administrative Rule (OAR) related to Transportation Planning is found in OAR 660-012-0000 through 660-012-0070. The purpose of the rule is to create a safe and viable transportation system and develop transportation facilities and services in coordination with land development that accomplish a number of objectives. Some of the objectives include to:

- promote the development of transportation systems adequate to serve local, regional, and statewide needs and the mobility needs of those who are transportation disadvantaged;
- encourage and support a range of transportation choices for moving people that balance vehicular use with other modes of travel including walking, biking, and transit in order to reduce reliance on any one mode of transportation;
- provide for safe and convenient vehicular, transit, pedestrian, and bicycle access and circulation;
- facilitate safe, efficient and cost effective flow of freight and goods within regions and the state through a variety of modes including road, air, rail, and marine transportation;
- protect existing and planned transportation facilities, corridors, and sites for their intended purposes; and
- provide for the construction and implementation of transportation facilities, improvements, and services necessary to support comprehensive plans;

The City's updated Transportation Plan must satisfy the necessary elements provided in the rule (660-012-0020) including a determination of transportation needs and a road plan that lays out the system of arterials, collectors, and local street connections. The plan must include the functional classification of roads that are consistent with neighboring jurisdictions and regional plans. Other requirements include a public transportation plan, a bicycle and pedestrian plan, information regarding air, rail, water and pipeline transportation, a parking plan, and policies and land use regulations for implementing the Transportation System Plan. These are all elements that will be

included in the City’s Transportation System Plan. The focus of this memo has to do with changes made to the rule in 2012 related to policy and land use regulation provisions.

CHANGES TO THE TRANSPORTATION RULE

OAR 660-012-0060 – Plan and Land Use Regulation Amendments

Last month, staff provided the Council with examples and recommendations on potential code changes that will provide alternatives over the strict application of the level of service and concurrency standards. Council provided guidance on policies to pursue with the new plan. These policies included implementing a Roundabout First Policy, allowance for developers to pay a pro-rata share of needed improvements to a street or intersection, and exempt residences located above commercial development from trip generation calculations for purposes of assessing system development charges (SDC). These changes are meant to aid in promoting new development at its planned maximum density and intensity while maintaining an effective transportation system. Council was also interested in learning more about other policies and directed staff to provide more information. These items included pros and cons of requiring a traffic impact analysis (TIA) and improvements at the time of zone change versus development of the property and analysis of other modes as part of the TIA.

In the last five years the State has amended the transportation rule to provide jurisdictions more options when reviewing and approving amendments to a functional classification plan, the Comprehensive Plan, or a land use regulation, including a zone change. As the rule is written, jurisdictions must evaluate proposals (such as a zone change or Comprehensive Plan amendment) and determine if the change has a significant effect on an existing or planned transportation facility. An applicant is typically required to provide a traffic impact analysis in order to identify the impacts the proposed change will have on the transportation system. The rule indicates that an amendment significantly affects a facility if it would:

- a) change the functional classification of an existing or planned transportation facility;
- b) change standards implementing a functional classification system;
- c) effect the types or levels of travel or access that are inconsistent with the functional classification of an existing or planned transportation facility;
- d) degrade the performance of an existing or planned transportation facility such that it would not meet the performance standards identified in the TSP or Comprehensive Plan; or
- e) degrade the performance of an existing or planned facility that is otherwise projected to not meet the performance standards identified in the TSP or Comprehensive Plan. *See Exhibit A (Summary and Amendments to the TPR)*

If the City determines that a significant effect would result, then the City must ensure the allowed land uses are consistent with the planned function, capacity, and performance standards of the facility through one or more solutions in the rule. Some of the solutions include adopting measures that demonstrate allowed land uses are consistent with the function, capacity, and performance standards of the facility or amending the TSP to modify the planned function, capacity, or performance standards of the facility. A modification to a facility may be reducing the level of service standard.

The changes in 2012 added provisions that would allow the City to offset a significant effect by installing improvements that would benefit other modes, benefit other facilities not affected, or make improvements in other locations if evidence shows the system wide benefits help balance the problem identified. For example, if a proposed change affects an intersection or requires additional lanes, but the improvements are too costly or require dedication of right-of-way that could negatively impact existing development, the applicant could propose to upgrade a parallel street with bike lanes, sidewalks, or some other improvement. This allowance improves other parts of the transportation system rather than making changes to the facility in question. The City would need to codify how this requirement is implemented when an application for an amendment is reviewed. This concept of design/construction alternatives was introduced during the discussion of Level of Service and Concurrency.

The rule adds three other provisions that may serve the needs of the City and should be considered in the update to the Transportation System Plan and associated code amendments.

OAR 660-012-0060 (9)

This section of the rule relates to zoning map amendments and parameters by which a jurisdiction may find that the proposal does not significantly affect a transportation facility. The amendment must meet all of the following requirements:

1. The proposed zoning is consistent with the Comprehensive Plan map designation and the comprehensive plan map is not changed;
2. The jurisdiction has an acknowledged Transportation System Plan and the proposal is consistent with it;
3. The property is not exempted from this rule at the time of an Urban Growth Boundary amendment (per OAR 660-024-0020 (1)(d)) or the area was exempted from the rule but the jurisdiction has a subsequently acknowledged TSP amendment that accounts for the urbanization of the area.

This portion of the rule seems to imply that an applicant may not need to submit a traffic impact analysis with the zone change application if all of the requirements can be satisfied.

The Attorney's Office as asked to interpret whether this indeed is a correct interpretation of this provision. Legal staff explained that one could read into this rule to not require a traffic impact analysis based on the language and if a finding is made that other sections of the rule (OAR 660-0120-0060 (1) and (2)) are met. Unfortunately, since this portion of the rule is relatively new there is no current case law that has challenged or upheld such an interpretation making it difficult to provide exact direction on its use.

This provision could be helpful in recent cases where the General Land Use Plan (GLUP) designations were changed as in the first phase of the Urban Growth Boundary amendment through the Internal Study Areas project. Properties within the existing city limits were intensified to provide more development opportunities and, as such, have been accounted for in the updated Transportation System Plan. These lands may be candidates to test out this rule by not requiring a traffic impact analysis. The removal of this requirement would be a benefit to the property owner seeking a re-zone of the land to match the new GLUP designation by helping to save time and cost.

OAR 660-012-0060 (10)

The next part of the rule provides a jurisdiction with the option to amend the Comprehensive Plan or land use regulation without applying performance standards related to automobile traffic congestion (volume to capacity or V/C), delay (Level of Service), or travel time if the development is part of a designated multimodal mixed-use area (MMA).

An MMA is identified in the rule as a boundary adopted by a local jurisdiction through a comprehensive plan amendment and that is acknowledged as such by the State. The area is entirely within an Urban Growth Boundary, includes a concentration of wide range of uses including medium to high density residential, offices, retail, restaurants, and open space and includes civic or cultural uses or a core commercial area where multi-story buildings are permitted. The MMA has specific development requirements such that buildings and building entrances are oriented to the streets, includes street connections and crossings that make it safe and accessible from adjacent areas, provides one or more transit stops, and prohibits or limits uses of low-intensity such as industrial uses, automobile sales and services, and drive-through services.

The area must also be located at least one-quarter mile from a ramp terminal intersection of an existing or planned interchange. If the MMA is located within an adopted Interchange Area Management Plan (IAMP) or within one-quarter mile of an existing or planned interchange the agency responsible for that facility must concur in writing that the safety and operation of the interchange area is not impacted as described in the rule.

Areas designated as MMA's are not subject to motor vehicle performance standards, like level of service or volume/capacity ratios. There are opportunities for re-development and new development to be future candidates for this type of designation. Downtown, the Liberty Park neighborhood, and the Southeast Commercial Center are all good candidates for this designation.

OAR 660-012-0060 (11)

The final part of the rule provides a jurisdiction the ability to approve an amendment by only requiring partial mitigation of an affected facility. This provision is intended to apply when the amendment will create or retain industrial or traded-sector jobs with no or limited incidental retail uses permitted (not to exceed 5 percent of the net developable area).

The City could establish parameters when such partial mitigation is enabled such as creation or expansion of a certain amount of jobs and/or at certain wage rates. It also would need to be identified what type of required improvements warrant only partial mitigation and what are acceptable forms of mitigation.

Staff has heard from one member of the Citizen Advisory Committee that building flexibility and use of these rules into the City code and TSP are important considerations. *See Exhibit B (Memorandum from Mike Montero)*

STAFF RECOMMENDATION

- Allow mitigation measures to other modes or improvements on different streets or intersections to offset a failing facility
- Incorporate language related to Section 9 and identify when a traffic impact analysis may be waived with zone change applications
- Pursue the multimodal mixed-use area designation with the state for the Downtown, Liberty Park neighborhood, and the Southeast Commercial Center
- Establish criteria that would allow for partial mitigation of transportation facilities that creates industrial or traded sector jobs; expand this criteria locally to include other larger employers or housing developments

EXHIBITS

A – Summary and Amendments to the Transportation Planning Rule 660-012-0005 & 0060

B – Letter from Mike Montero dated September 22, 2017



Oregon

John A. Kitzhaber, M.D., Governor

Land Conservation and Development Commission

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Summary of Amendments to the Transportation Planning Rule (TPR) Regarding Plan and Land Use Regulation Amendments

Oregon Administrative Rule 660-012-0060

Summary of New Sections

Rezoning Consistent with Comprehensive Plan Map – Section (9)

If a proposed rezoning is consistent with the existing comprehensive plan map designation, and consistent with the acknowledged transportation system plan, then it can be approved without considering the effect on the transportation system. Special provisions in subsection (c) apply if the area was added to the urban growth boundary (UGB).

Compact Urban Development – Section (10)

Local governments can designate areas where traffic congestion (e.g., v/c ratio) does not have to be considered when rezoning property, amending comprehensive plan designations or amending development regulations.

- Subsection (b) lists the requirements for these multimodal mixed-use areas (MMA):
 - Must allow a range of uses, including residential (allowing at least 12 units per acre), offices, retail, services, restaurants, parks, plazas, civic, cultural and multi-story commercial buildings.
 - Must have appropriate development standards, including building entrances oriented to the street, a connected street network within and to the MMA, pedestrian-oriented street design, transit stops (if transit exists) and reduced requirements for off-street parking.
 - Must limit or prohibit low-intensity uses such as industrial, automobile sales, automobile services and drive-throughs.
 - Must be entirely within a UGB.
- If the MMA is near a freeway interchange, then the potential for backups on the off-ramps must be considered (see subsection (c)) and concurrence from the Oregon Department of Transportation (ODOT) is required.

Economic Development – Section (11)

If a proposed rezoning qualifies as economic development, then it can be approved without mitigating the full effect on traffic.

- Two definitions of economic development in subsection (a):
 - General definition: “Industrial or traded-sector jobs created or retained,” with details for these terms in paragraph (a)(C).
 - Smaller cities outside the Willamette Valley can use a broader definition that adds “prime industrial land” and “other employment uses” (which could include retail).
- Subsection (b) allows “partial mitigation,” but does not define how much mitigation is required because it will be different in every case based on the balance of economic benefit and traffic impacts.
 - Local government determines if benefits outweigh negative effects on the local system.
 - ODOT, coordinating with Business Oregon, makes the determination for the state system.
- Subsection (c) requires coordination with state, regional and other local governments.

Summary of Changes within Existing Sections

Transportation Demand Management – Subsection (1)(c)

When determining whether or not there is a “significant effect,” transportation demand management – or any other enforceable, ongoing condition of approval that would reduce the amount of traffic generated – can be factored in to eliminate or diminish the significant effect.

Other Modes, Facilities or Locations – Subsection (2)(e)

- Three new options for addressing a significant effect, including improvements to:
 - Other modes (example: the significant effect is motor vehicle traffic congestion, the mitigation could be adding sidewalks and bicycle lanes).
 - Other facilities (example: the significant effect occurs along one street, the mitigation could be on another parallel street).
 - Other locations (example: the significant effect occurs at one intersection, the mitigation could be at other intersections along the same highway).
- If the significant effect occurs on a state highway, then these options are only allowed with ODOT concurrence. If on a county road within a city, then county concurrence is required.

Failing Facilities – Subsection (3)(a)

If a facility is projected to fail to meet the performance standards at the planning horizon, and if there are no funded improvements that would fix this, then a proposed rezoning must avoid further degradation at the time of development, but is not required to provide mitigation to meet the performance standards.

Additional Information

Complete Rule Text as Amended

www.oregon.gov/LCD/docs/rulemaking/2009-11/TPR/TPR_Amendments-Legislative_Style.pdf

Rulemaking Process

These amendments were adopted by the Land Conservation and Development Commission December 8, 2011 and took effect January 1, 2012.

www.oregon.gov/LCD/Rulemaking_TPR_2011.shtml

Oregon Highway Plan

The Oregon Transportation Commission adopted amendments to Oregon Highway Plan in coordination with the TPR amendments.

www.oregon.gov/ODOT/TD/TP/OHP2011.shtml

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Disclaimer

This brief summary does not explain all of the requirements. Applying these rules to any specific situation requires careful consideration of the full text of the rule, other administrative rules, local regulations, the Oregon Highway Plan and relevant case law.

January 18, 2012

Amendments to the Transportation Planning Rules

Oregon Administrative Rules 660-012-0005 & 0060

Adopted by the Oregon Land Conservation and Development Commission December 9, 2011.

Filed with the Secretary of State December 30, 2011. Effective January 1, 2012.

Additions are **bold and underlined**. Deletions are [~~struck through in brackets~~].

660-012-0005

Definitions

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

(2) "Accessway" means a walkway that provides pedestrian and or bicycle passage either between streets or from a street to a building or other destination such as a school, park, or transit stop. Accessways generally include a walkway and additional land on either side of the walkway, often in the form of an easement or right-of-way, to provide clearance and separation between the walkway and adjacent uses. Accessways through parking lots are generally physically separated from adjacent vehicle parking or parallel vehicle traffic by curbs or similar devices and include landscaping, trees and lighting. Where accessways cross driveways, they are generally raised, paved or marked in a manner which provides convenient access for pedestrians.

(3) "Affected Local Government" means a city, county or metropolitan service district that is directly impacted by a proposed transportation facility or improvement.

(4) "Approach Road" means a legally constructed, public or private connection that provides vehicular access either to or from or to and from a highway and an adjoining property.

(5) "At or near a major transit stop": "At" means a parcel or ownership which is adjacent to or

includes a major transit stop generally including portions of such parcels or ownerships that are within 200 feet of a transit stop. "Near" generally means a parcel or ownership that is within 300 feet of a major transit stop. The term "generally" is intended to allow local governments through their plans and ordinances to adopt more specific definitions of these terms considering local needs and circumstances consistent with the overall objective and requirement to provide convenient pedestrian access to transit.

(6) "Committed Transportation Facilities" means those proposed transportation facilities and improvements which are consistent with the acknowledged comprehensive plan and have approved funding for construction in a public facilities plan or the Six-Year Highway or Transportation Improvement Program.

(7) "Demand Management" means actions which are designed to change travel behavior in order to improve performance of transportation facilities and to reduce need for additional road capacity. Methods may include, but are not limited to, the use of alternative modes, ride-sharing and vanpool programs, [~~and~~]trip-reduction ordinances, **shifting to off-peak periods, and reduced or paid parking**.

(8) "Influence area of an interchange" means the area 1,320 feet from an interchange ramp terminal measured on the crossroad away from the mainline.

(9) "Local streets" means streets that are functionally classified as local streets to serve primarily local access to property and circulation within neighborhoods or specific areas. Local

streets do not include streets functionally classified as collector or arterials.

(10) "Local Street Standards" include but are not limited to standards for right-of-way, pavement width, travel lanes, parking lanes, curb turning radius, and accessways.

(11) "Major" means, in general, those facilities or developments which, considering the size of the urban or rural area and the range of size, capacity or service level of similar facilities or developments in the area, are either larger than average, serve more than neighborhood needs or have significant land use or traffic impacts on more than the immediate neighborhood:

(a) "Major" as it modifies transit corridors, stops, transfer stations and new transportation facilities means those facilities which are most important to the functioning of the system or which provide a high level, volume or frequency of service;

(b) "Major" as it modifies industrial, institutional and retail development means such developments which are larger than average, serve more than neighborhood needs or which have traffic impacts on more than the immediate neighborhood;

(c) Application of the term "major" will vary from area to area depending upon the scale of transportation improvements, transit facilities and development which occur in the area. A facility considered to be major in a smaller or less densely developed area may, because of the relative significance and impact of the facility or development, not be considered a major facility in a larger or more densely developed area with larger or more intense development or facilities.

(12) "Major transit stop" means:

(a) Existing and planned light rail stations and transit transfer stations, except for temporary facilities;

(b) Other planned stops designated as major transit stops in a transportation system plan and existing stops which:

(A) Have or are planned for an above average frequency of scheduled, fixed-route

service when compared to region wide service. In urban areas of 1,000,000 or more population major transit stops are generally located along routes that have or are planned for 20 minute service during the peak hour; and

(B) Are located in a transit oriented development or within 1/4 mile of an area planned and zoned for:

(i) Medium or high density residential development; or

(ii) Intensive commercial or institutional uses within 1/4 mile of subsection (i); or

(iii) Uses likely to generate a relatively high level of transit ridership.

(13) "Metropolitan area" means the local governments that are responsible for adopting local or regional transportation system plans within a metropolitan planning organization (MPO) boundary. This includes cities, counties, and, in the Portland Metropolitan area, Metro.

(14) "Metropolitan Planning Organization (MPO)" means an organization located within the State of Oregon and designated by the Governor to coordinate transportation planning in an urbanized area of the state including such designations made subsequent to the adoption of this rule. The Longview-Kelso-Rainier MPO is not considered an MPO for the purposes of this rule.

(15) "Minor transportation improvements" include, but are not limited to, signalization, addition of turn lanes or merge/deceleration lanes on arterial or collector streets, provision of local streets, transportation system management measures, modification of existing interchange facilities within public right of way and design modifications located within an approved corridor. Minor transportation improvements may or may not be listed as planned projects in a TSP where the improvement is otherwise consistent with the TSP. Minor transportation improvements do not include new interchanges; new approach roads within the influence area of an interchange; new intersections on limited access roadways, highways or expressways; new collector or

arterial streets, road realignments or addition of travel lanes.

(16) "ODOT" means the Oregon Department of Transportation.

(17) "Parking Spaces" means on and off street spaces designated for automobile parking in areas planned for industrial, commercial, institutional or public uses. The following are not considered parking spaces for the purposes of OAR 660-012-0045(5)(c): park and ride lots, handicapped parking, and parking spaces for carpools and vanpools.

(18) "Pedestrian connection" means a continuous, unobstructed, reasonably direct route between two points that is intended and suitable for pedestrian use. Pedestrian connections include but are not limited to sidewalks, walkways, accessways, stairways and pedestrian bridges. On developed parcels, pedestrian connections are generally hard surfaced. In parks and natural areas, pedestrian connections may be soft-surfaced pathways. On undeveloped parcels and parcels intended for redevelopment, pedestrian connections may also include rights of way or easements for future pedestrian improvements.

(19) "Pedestrian district" means a comprehensive plan designation or implementing land use regulations, such as an overlay zone, that establish requirements to provide a safe and convenient pedestrian environment in an area planned for a mix of uses likely to support a relatively high level of pedestrian activity. Such areas include but are not limited to:

- (a) Lands planned for a mix of commercial or institutional uses near lands planned for medium to high density housing; or
- (b) Areas with a concentration of employment and retail activity; and
- (c) Which have or could develop a network of streets and accessways which provide convenient pedestrian circulations.

(20) "Pedestrian plaza" means a small semi-enclosed area usually adjoining a sidewalk or a transit stop which provides a place for pedestrians to sit, stand or rest. They are usually paved with concrete, pavers, bricks or similar material and include seating, pedestrian scale lighting and

similar pedestrian improvements. Low walls or planters and landscaping are usually provided to create a semi-enclosed space and to buffer and separate the plaza from adjoining parking lots and vehicle maneuvering areas. Plazas are generally located at a transit stop, building entrance or an intersection and connect directly to adjacent sidewalks, walkways, transit stops and buildings. A plaza including 150-250 square feet would be considered "small."

(21) "Pedestrian scale" means site and building design elements that are dimensionally less than those intended to accommodate automobile traffic, flow and buffering. Examples include ornamental lighting of limited height; bricks, pavers or other modules of paving with small dimensions; a variety of planting and landscaping materials; arcades or awnings that reduce the height of walls; and signage and signpost details that can only be perceived from a short distance.

(22) "Planning Period" means the twenty-year period beginning with the date of adoption of a TSP to meet the requirements of this rule.

(23) "Preliminary Design" means an engineering design which specifies in detail the location and alignment of a planned transportation facility or improvement.

(24) "Reasonably direct" means either a route that does not deviate unnecessarily from a straight line or a route that does not involve a significant amount of out-of-direction travel for likely users.

(25) "Refinement Plan" means an amendment to the transportation system plan, which resolves, at a systems level, determinations on function, mode or general location which were deferred during transportation system planning because detailed information needed to make those determinations could not reasonably be obtained during that process.

(26) "Regional Transportation Plan" or "RTP" means the long-range transportation plan prepared and adopted by a metropolitan planning organization for a metropolitan area as provided for in federal law.

(27) "Roads" means streets, roads and highways.

(28) "Rural community" means areas defined as resort communities and rural communities in

accordance with OAR 660-022-0010(6) and (7). For the purposes of this division, the area need only meet the definitions contained in the Unincorporated Communities Rule although the area may not have been designated as an unincorporated community in accordance with OAR 660-022-0020.

(29) "Transit-Oriented Development (TOD)" means a mix of residential, retail and office uses and a supporting network of roads, bicycle and pedestrian ways focused on a major transit stop designed to support a high level of transit use. The key features of transit oriented development include:

- (a) A mixed-use center at the transit stop, oriented principally to transit riders and pedestrian and bicycle travel from the surrounding area;
- (b) High density of residential development proximate to the transit stop sufficient to support transit operation and neighborhood commercial uses within the TOD;
- (c) A network of roads, and bicycle and pedestrian paths to support high levels of pedestrian access within the TOD and high levels of transit use.

(30) "Transportation Facilities" means any physical facility that moves or assist in the movement of people or goods including facilities identified in OAR 660-012-0020 but excluding electricity, sewage and water systems.

(31) "Transportation System Management Measures" means techniques for increasing the efficiency, safety, capacity or level of service of a transportation facility without increasing its size. Examples include, but are not limited to, traffic signal improvements, traffic control devices including installing medians and parking removal, channelization, access management, ramp metering, and restriping of high occupancy vehicle (HOV) lanes.

(32) "Transportation Needs" means estimates of the movement of people and goods consistent with acknowledged comprehensive plan and the requirements of this rule. Needs are typically based on projections of future travel demand resulting from a continuation of current trends as modified by policy objectives, including those

expressed in Goal 12 and this rule, especially those for avoiding principal reliance on any one mode of transportation.

(33) "Transportation Needs, Local" means needs for movement of people and goods within communities and portions of counties and the need to provide access to local destinations.

(34) "Transportation Needs, Regional" means needs for movement of people and goods between and through communities and accessibility to regional destinations within a metropolitan area, county or associated group of counties.

(35) "Transportation Needs, State" means needs for movement of people and goods between and through regions of the state and between the state and other states.

(36) "Transportation Project Development" means implementing the transportation system plan (TSP) by determining the precise location, alignment, and preliminary design of improvements included in the TSP based on site-specific engineering and environmental studies.

(37) "Transportation Service" means a service for moving people and goods, such as intercity bus service and passenger rail service.

(38) "Transportation System Plan (TSP)" means a plan for one or more transportation facilities that are planned, developed, operated and maintained in a coordinated manner to supply continuity of movement between modes, and within and between geographic and jurisdictional areas.

(39) "Urban Area" means lands within an urban growth boundary, two or more contiguous urban growth boundaries, and urban unincorporated communities as defined by OAR 660-022-0010(9). For the purposes of this division, the area need only meet the definition contained in the Unincorporated Communities Rule although the area may not have been designated as an unincorporated community in accordance with OAR 660-022-0020.

(40) "Urban Fringe" means:

- (a) Areas outside the urban growth boundary that are within 5 miles of the urban growth boundary of an MPO area; and

(b) Areas outside the urban growth boundary within 2 miles of the urban growth boundary of an urban area containing a population greater than 25,000.

(41) “Vehicle Miles of Travel (VMT)”: means automobile vehicle miles of travel. Automobiles, for purposes of this definition, include automobiles, light trucks, and other similar vehicles used for movement of people. The definition does not include buses, heavy trucks and trips that involve commercial movement of goods. VMT includes trips with an origin and a destination within the MPO boundary and excludes pass through trips (i.e., trips with a

beginning and end point outside of the MPO) and external trips (i.e., trips with a beginning or end point outside of the MPO boundary). VMT is estimated prospectively through the use of metropolitan area transportation models.

(42) “Walkway” means a hard surfaced area intended and suitable for use by pedestrians, including sidewalks and surfaced portions of accessways.

Stat. Auth.: ORS 197.040

Stats. Implemented: ORS 195.012, 197.040, 197.712, 197.717, 197.732

660-012-0060

Plan and Land Use Regulation Amendments

(1) ~~[Where]~~ **If** an amendment to a functional plan, an acknowledged comprehensive plan, or a land use regulation (including a zoning map) would significantly affect an existing or planned transportation facility, **then** the local government ~~must~~ ~~[shall]~~ put in place measures as provided in section (2) of this rule, **unless the amendment is allowed under section (3), (9) or (10) of this rule** ~~[to assure that allowed land uses are consistent with the identified function, capacity, and performance standards (e.g. level of service, volume to capacity ratio, etc.) of the facility]~~. A plan or land use regulation amendment significantly affects a transportation facility if it would:

- (a) Change the functional classification of an existing or planned transportation facility (exclusive of correction of map errors in an adopted plan);
- (b) Change standards implementing a functional classification system; or
- (c) **Result in any of the effects listed in paragraphs (A) through (C) of this subsection based on projected conditions** ~~[As]~~ measured at the end of the planning period identified in the adopted ~~[transportation system plan]~~ **TSP. As part of evaluating projected conditions, the amount of traffic projected to be generated within the area of the amendment may be reduced if the**

amendment includes an enforceable, ongoing requirement that would demonstrably limit traffic generation, including, but not limited to, transportation demand management. This reduction may diminish or completely eliminate the significant effect of the amendment. ~~[:]~~

- (A) ~~[Allow land uses or levels of development that would result in t]~~ **Types or levels of travel or access that are inconsistent with the functional classification of an existing or planned transportation facility;**
- (B) **Degrade** ~~[Reduce]~~ the performance of an existing or planned transportation facility **such that it would not meet the** ~~[below the minimum acceptable]~~ performance standards identified in the TSP or comprehensive plan; or
- (C) **Degrade** ~~[Worsen]~~ the performance of an existing or planned transportation facility that is otherwise projected to **not meet the** ~~[perform below the minimum acceptable]~~ performance standards identified in the TSP or comprehensive plan.

(2) ~~[Where]~~ **If** a local government determines that there would be a significant effect, ~~[compliance with section (1) shall be accomplished]~~ **then the local government must ensure that allowed land uses are consistent with the identified**

function, capacity, and performance standards of the facility measured at the end of the planning period identified in the adopted TSP through one or a combination of the [following:] remedies listed in (a) through (e) below, unless the amendment meets the balancing test in subsection (2)(e) of this section or qualifies for partial mitigation in section (11) of this rule. A local government using subsection (2)(e), section (3), section (10) or section (11) to approve an amendment recognizes that additional motor vehicle traffic congestion may result and that other facility providers would not be expected to provide additional capacity for motor vehicles in response to this congestion.

(a) Adopting measures that demonstrate allowed land uses are consistent with the planned function, capacity, and performance standards of the transportation facility.

(b) Amending the TSP or comprehensive plan to provide transportation facilities, improvements or services adequate to support the proposed land uses consistent with the requirements of this division; such amendments shall include a funding plan or mechanism consistent with section (4) or include an amendment to the transportation finance plan so that the facility, improvement, or service will be provided by the end of the planning period.

~~(c) Altering land use designations, densities, or design requirements to reduce demand for automobile travel and meet travel needs through other modes.]~~

~~(c)[d])~~ Amending the TSP to modify the planned function, capacity or performance standards of the transportation facility.

~~(d)[e])~~ Providing other measures as a condition of development or through a development agreement or similar funding method, including, **but not limited to**, transportation system management measures~~[- demand management]~~ or minor transportation improvements. Local governments shall, as part of the amendment, specify when measures or improvements provided pursuant to this subsection will be provided.

(e) Providing improvements that would benefit modes other than the significantly affected mode, improvements to facilities other than the significantly affected facility, or improvements at other locations, if the provider of the significantly affected facility provides a written statement that the system-wide benefits are sufficient to balance the significant effect, even though the improvements would not result in consistency for all performance standards.

(3) Notwithstanding sections (1) and (2) of this rule, a local government may approve an amendment that would significantly affect an existing transportation facility without assuring that the allowed land uses are consistent with the function, capacity and performance standards of the facility where:

~~[(a) The facility is already performing below the minimum acceptable performance standard identified in the TSP or comprehensive plan on the date the amendment application is submitted;]~~

~~(a)[b])~~ In the absence of the amendment, planned transportation facilities, improvements and services as set forth in section (4) of this rule would not be adequate to achieve consistency with the identified function, capacity or performance standard for that facility by the end of the planning period identified in the adopted TSP;

~~(b)[e])~~ Development resulting from the amendment will, at a minimum, mitigate the impacts of the amendment in a manner that avoids further degradation to the performance of the facility by the time of the development through one or a combination of transportation improvements or measures;

~~(c)[d])~~ The amendment does not involve property located in an interchange area as defined in paragraph (4)(d)(C); and

~~(d)[e])~~ For affected state highways, ODOT provides a written statement that the proposed funding and timing for the identified mitigation improvements or measures are, at a minimum, sufficient to avoid further degradation to the performance of the affected

state highway. However, if a local government provides the appropriate ODOT regional office with written notice of a proposed amendment in a manner that provides ODOT reasonable opportunity to submit a written statement into the record of the local government proceeding, and ODOT does not provide a written statement, then the local government may proceed with applying subsections (a) through (c) of this section.

(4) Determinations under sections (1)-(3) of this rule shall be coordinated with affected transportation facility and service providers and other affected local governments.

(a) In determining whether an amendment has a significant effect on an existing or planned transportation facility under subsection (1)(c) of this rule, local governments shall rely on existing transportation facilities and services and on the planned transportation facilities, improvements and services set forth in subsections (b) and (c) below.

(b) Outside of interstate interchange areas, the following are considered planned facilities, improvements and services:

(A) Transportation facilities, improvements or services that are funded for construction or implementation in the Statewide Transportation Improvement Program or a locally or regionally adopted transportation improvement program or capital improvement plan or program of a transportation service provider.

(B) Transportation facilities, improvements or services that are authorized in a local transportation system plan and for which a funding plan or mechanism is in place or approved. These include, but are not limited to, transportation facilities, improvements or services for which: transportation systems development charge revenues are being collected; a local improvement district or reimbursement district has been established or will be established prior to development; a development agreement has been adopted; or conditions of

approval to fund the improvement have been adopted.

(C) Transportation facilities, improvements or services in a metropolitan planning organization (MPO) area that are part of the area's federally-approved, financially constrained regional transportation system plan.

(D) Improvements to state highways that are included as planned improvements in a regional or local transportation system plan or comprehensive plan when ODOT provides a written statement that the improvements are reasonably likely to be provided by the end of the planning period.

(E) Improvements to regional and local roads, streets or other transportation facilities or services that are included as planned improvements in a regional or local transportation system plan or comprehensive plan when the local government(s) or transportation service provider(s) responsible for the facility, improvement or service provides a written statement that the facility, improvement or service is reasonably likely to be provided by the end of the planning period.

(c) Within interstate interchange areas, the improvements included in (b)(A)-(C) are considered planned facilities, improvements and services, except where:

(A) ODOT provides a written statement that the proposed funding and timing of mitigation measures are sufficient to avoid a significant adverse impact on the Interstate Highway system, then local governments may also rely on the improvements identified in paragraphs (b)(D) and (E) of this section; or

(B) There is an adopted interchange area management plan, then local governments may also rely on the improvements identified in that plan and which are also identified in paragraphs (b)(D) and (E) of this section.

(d) As used in this section and section (3):

(A) Planned interchange means new interchanges and relocation of existing interchanges that are authorized in an adopted transportation system plan or comprehensive plan;

(B) Interstate highway means Interstates 5, 82, 84, 105, 205 and 405; and

(C) Interstate interchange area means:

(i) Property within **one-quarter**~~[one-half]~~ mile **of the ramp terminal intersection** of an existing or planned interchange on an Interstate Highway~~[as measured from the center point of the interchange]~~; or

(ii) The interchange area as defined in the Interchange Area Management Plan adopted as an amendment to the Oregon Highway Plan.

(e) For purposes of this section, a written statement provided pursuant to paragraphs (b)(D), (b)(E) or (c)(A) provided by ODOT, a local government or transportation facility provider, as appropriate, shall be conclusive in determining whether a transportation facility, improvement or service is a planned transportation facility, improvement or service. In the absence of a written statement, a local government can only rely upon planned transportation facilities, improvements and services identified in paragraphs (b)(A)-(C) to determine whether there is a significant effect that requires application of the remedies in section (2).

(5) The presence of a transportation facility or improvement shall not be a basis for an exception to allow residential, commercial, institutional or industrial development on rural lands under this division or OAR 660-004-0022 and 660-004-0028.

(6) In determining whether proposed land uses would affect or be consistent with planned transportation facilities as provided in **sections** ~~[0060]~~(1) and (2), local governments shall give full credit for potential reduction in vehicle trips for uses located in mixed-use, pedestrian-friendly

centers, and neighborhoods as provided in **subsections** (a)-(d) below;

(a) Absent adopted local standards or detailed information about the vehicle trip reduction benefits of mixed-use, pedestrian-friendly development, local governments shall assume that uses located within a mixed-use, pedestrian-friendly center, or neighborhood, will generate 10% fewer daily and peak hour trips than are specified in available published estimates, such as those provided by the Institute of Transportation Engineers (ITE) Trip Generation Manual that do not specifically account for the effects of mixed-use, pedestrian-friendly development. The 10% reduction allowed for by this section shall be available only if uses which rely solely on auto trips, such as gas stations, car washes, storage facilities, and motels are prohibited;

(b) Local governments shall use detailed or local information about the trip reduction benefits of mixed-use, pedestrian-friendly development where such information is available and presented to the local government. Local governments may, based on such information, allow reductions greater than the 10% reduction required in **subsection (a) above**;

(c) Where a local government assumes or estimates lower vehicle trip generation as provided in **subsection (a) or (b) above**, it shall assure through conditions of approval, site plans, or approval standards that subsequent development approvals support the development of a mixed-use, pedestrian-friendly center or neighborhood and provide for on-site bike and pedestrian connectivity and access to transit as provided for in **OAR 660-012-0045(3) and (4)**. The provision of on-site bike and pedestrian connectivity and access to transit may be accomplished through application of acknowledged ordinance provisions which comply with **OAR 660-012-0045(3) and (4)** or through conditions of approval or findings adopted with the plan amendment that assure compliance with these

rule requirements at the time of development approval; and

(d) The purpose of this section is to provide an incentive for the designation and implementation of pedestrian-friendly, mixed-use centers and neighborhoods by lowering the regulatory barriers to plan amendments which accomplish this type of development. The actual trip reduction benefits of mixed-use, pedestrian-friendly development will vary from case to case and may be somewhat higher or lower than presumed pursuant to **subsection** (a) above. The Commission concludes that this assumption is warranted given general information about the expected effects of mixed-use, pedestrian-friendly development and its intent to encourage changes to plans and development patterns. Nothing in this section is intended to affect the application of provisions in local plans or ordinances which provide for the calculation or assessment of systems development charges or in preparing conformity determinations required under the federal Clean Air Act.

(7) Amendments to acknowledged comprehensive plans and land use regulations which meet all of the criteria listed in **subsections** (a)-(c) below shall include an amendment to the comprehensive plan, transportation system plan the adoption of a local street plan, access management plan, future street plan or other binding local transportation plan to provide for on-site alignment of streets or accessways with existing and planned arterial, collector, and local streets surrounding the site as necessary to implement the requirements in ~~[Section]~~**OAR 660-012-0020(2)(b)** and ~~[Section]~~**660-012-0045(3)**~~[of this division]:~~

(a) The plan or land use regulation amendment results in designation of two or more acres of land for commercial use;

(b) The local government has not adopted a TSP or local street plan which complies with ~~[Section]~~**OAR 660-012-0020(2)(b)** or, in the Portland Metropolitan Area, has not complied with Metro's requirement for street connectivity as contained in Title 6, Section 3 of the Urban Growth Management Functional Plan; and

(c) The proposed amendment would significantly affect a transportation facility as provided in **section** ~~[0060]~~(1).

(8) A "mixed-use, pedestrian-friendly center or neighborhood" for the purposes of this rule, means:

(a) Any one of the following:

(A) An existing central business district or downtown;

(B) An area designated as a central city, regional center, town center or main street in the Portland Metro 2040 Regional Growth Concept;

(C) An area designated in an acknowledged comprehensive plan as a transit oriented development or a pedestrian district; or

(D) An area designated as a special transportation area as provided for in the Oregon Highway Plan.

(b) An area other than those listed in **subsection** (a) **above** which includes or is planned to include the following characteristics:

(A) A concentration of a variety of land uses in a well-defined area, including the following:

(i) Medium to high density residential development (12 or more units per acre);

(ii) Offices or office buildings;

(iii) Retail stores and services;

(iv) Restaurants; and

(v) Public open space or private open space which is available for public use, such as a park or plaza.

(B) Generally include civic or cultural uses;

(C) A core commercial area where multi-story buildings are permitted;

(D) Buildings and building entrances oriented to streets;

(E) Street connections and crossings that make the center safe and conveniently accessible from adjacent areas;

(F) A network of streets and, where appropriate, accessways and major driveways that make it attractive and

highly convenient for people to walk between uses within the center or neighborhood, including streets and major driveways within the center with wide sidewalks and other features, including pedestrian-oriented street crossings, street trees, pedestrian-scale lighting and on-street parking;

- (G) One or more transit stops (in urban areas with fixed route transit service); and
- (H) Limit or do not allow low-intensity or land extensive uses, such as most industrial uses, automobile sales and services, and drive-through services.

(9) Notwithstanding section (1) of this rule, a local government may find that an amendment to a zoning map does not significantly affect an existing or planned transportation facility if all of the following requirements are met.

- (a) The proposed zoning is consistent with the existing comprehensive plan map designation and the amendment does not change the comprehensive plan map;**
- (b) The local government has an acknowledged TSP and the proposed zoning is consistent with the TSP; and**
- (c) The area subject to the zoning map amendment was not exempted from this rule at the time of an urban growth boundary amendment as permitted in OAR 660-024-0020(1)(d), or the area was exempted from this rule but the local government has a subsequently acknowledged TSP amendment that accounted for urbanization of the area.**

(10) Notwithstanding sections (1) and (2) of this rule, a local government may amend a functional plan, a comprehensive plan or a land use regulation without applying performance standards related to motor vehicle traffic congestion (e.g. volume to capacity ratio or V/C), delay or travel time if the amendment meets the requirements of subsection (a) of this section. This section does not exempt a proposed amendment from other transportation performance standards or policies that may apply including, but not limited to, safety for all modes, network connectivity for all modes (e.g. sidewalks,

bicycle lanes) and accessibility for freight vehicles of a size and frequency required by the development.

(a) A proposed amendment qualifies for this section if it:

(A) is a map or text amendment affecting only land entirely within a multimodal mixed-use area (MMA); and

(B) is consistent with the definition of an MMA and consistent with the function of the MMA as described in the findings designating the MMA.

(b) For the purpose of this rule, “multimodal mixed-use area” or “MMA” means an area:

(A) with a boundary adopted by a local government as provided in subsection (d) or (e) of this section and that has been acknowledged;

(B) entirely within an urban growth boundary;

(C) with adopted plans and development regulations that allow the uses listed in paragraphs (8)(b)(A) through (C) of this rule and that require new development to be consistent with the characteristics listed in paragraphs (8)(b)(D) through (H) of this rule;

(D) with land use regulations that do not require the provision of off-street parking, or regulations that require lower levels of off-street parking than required in other areas and allow flexibility to meet the parking requirements (e.g. count on-street parking, allow long-term leases, allow shared parking); and

(E) located in one or more of the categories below:

(i) at least one-quarter mile from any ramp terminal intersection of existing or planned interchanges;

(ii) within the area of an adopted Interchange Area Management Plan (IAMP) and consistent with the IAMP; or

(iii) within one-quarter mile of a ramp terminal intersection of an existing

or planned interchange if the mainline facility provider has provided written concurrence with the MMA designation as provided in subsection (c) of this section.

(c) When a mainline facility provider reviews an MMA designation as provided in subparagraph (b)(E)(iii) of this section, the provider must consider the factors listed in paragraph (A) of this subsection.

(A) The potential for operational or safety effects to the interchange area and the mainline highway, specifically considering:

(i) whether the interchange area has a crash rate that is higher than the statewide crash rate for similar facilities;

(ii) whether the interchange area is in the top ten percent of locations identified by the safety priority index system (SPIS) developed by ODOT; and

(iii) whether existing or potential future traffic queues on the interchange exit ramps extend onto the mainline highway or the portion of the ramp needed to safely accommodate deceleration.

(B) If there are operational or safety effects as described in paragraph (A) of this subsection, the effects may be addressed by an agreement between the local government and the facility provider regarding traffic management plans favoring traffic movements away from the interchange, particularly those facilitating clearing traffic queues on the interchange exit ramps.

(d) A local government may designate an MMA by adopting an amendment to the comprehensive plan or land use regulations to delineate the boundary following an existing zone, multiple existing zones, an urban renewal area, other existing boundary, or establishing a new boundary. The designation must be accompanied by findings showing how the area meets the definition of an MMA. Designation of an

MMA is not subject to the requirements in sections (1) and (2) of this rule.

(e) A local government may designate an MMA on an area where comprehensive plan map designations or land use regulations do not meet the definition, if all of the other elements meet the definition, by concurrently adopting comprehensive plan or land use regulation amendments necessary to meet the definition. Such amendments are not subject to performance standards related to motor vehicle traffic congestion, delay or travel time.

(11) A local government may approve an amendment with partial mitigation as provided in section (2) of this rule if the amendment complies with subsection (a) of this section, the amendment meets the balancing test in subsection (b) of this section, and the local government coordinates as provided in subsection (c) of this section.

(a) The amendment must meet paragraphs (A) and (B) of this subsection or meet paragraph (D) of this subsection.

(A) Create direct benefits in terms of industrial or traded-sector jobs created or retained by limiting uses to industrial or traded-sector industries.

(B) Not allow retail uses, except limited retail incidental to industrial or traded sector development, not to exceed five percent of the net developable area.

(C) For the purpose of this section:

(i) “industrial” means employment activities generating income from the production, handling or distribution of goods including, but not limited to, manufacturing, assembly, fabrication, processing, storage, logistics, warehousing, importation, distribution and transshipment and research and development.

(ii) “traded-sector” means industries in which member firms sell their goods

or services into markets for which national or international competition exists.

(D) Notwithstanding paragraphs (A) and (B) of this subsection, an amendment complies with subsection (a) if all of the following conditions are met:

(i) The amendment is within a city with a population less than 10,000 and outside of a Metropolitan Planning Organization.

(ii) The amendment would provide land for "Other Employment Use" or "Prime Industrial Land" as those terms are defined in OAR 660-009-0005.

(iii) The amendment is located outside of the Willamette Valley as defined in ORS 215.010.

(E) The provisions of paragraph (D) of this subsection are repealed on January 1, 2017.

(b) A local government may accept partial mitigation only if the local government determines that the benefits outweigh the negative effects on local transportation facilities and the local government receives from the provider of any transportation facility that would be significantly affected written concurrence that the benefits outweigh the negative effects on their transportation facilities. If the amendment significantly affects a state highway, then ODOT must coordinate with the Oregon Business Development Department regarding the economic and job creation benefits of the proposed amendment as defined in subsection (a) of this section. The requirement to obtain concurrence from a provider is satisfied if the local government provides notice as required by subsection (c) of this section and the provider does not respond in writing (either concurring or non-concurring) within forty-five days.

(c) A local government that proposes to use this section must coordinate with Oregon Business Development Department,

Department of Land Conservation and Development, area commission on transportation, metropolitan planning organization, and transportation providers and local governments directly impacted by the proposal to allow opportunities for comments on whether the proposed amendment meets the definition of economic development, how it would affect transportation facilities and the adequacy of proposed mitigation. Informal consultation is encouraged throughout the process starting with pre-application meetings. Coordination has the meaning given in ORS 197.015 and Goal 2 and must include notice at least 45 days before the first evidentiary hearing. Notice must include the following:

(A) Proposed amendment.

(B) Proposed mitigating actions from section (2) of this rule.

(C) Analysis and projections of the extent to which the proposed amendment in combination with proposed mitigating actions would fall short of being consistent with the function, capacity, and performance standards of transportation facilities.

(D) Findings showing how the proposed amendment meets the requirements of subsection (a) of this section.

(E) Findings showing that the benefits of the proposed amendment outweigh the negative effects on transportation facilities.

Stat. Auth.: ORS 183 & 197.040

Stats. Implemented: ORS 195.025, 197.040, 197.230, 197.245, 197.610 - 197.625, 197.628 - 197.646, 197.712, 197.717 & 197.732

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September 22, 2017

Mr. Matt Brinkley, Planning Director
City of Medford, Planning Department
City Hall, Lausmann Annex
Medford, OR 97501

RE: Comments Medford Draft Transportation System Plan

Dear Mr. Brinkley:

Thank you for the opportunity to provide input in the City's process to update its Transportation System Plan (TSP). As discussed at the City's Ward 4 meeting of September 13, 2017 (which was attended by city staff and Councilor Wallen) the following represents the substance of my comments provided at that meeting.

Once the TSP is adopted and acknowledged, it represents the regulatory framework that governs how the City implements meeting future urban demands. Historically, Medford has relied upon its Level of Service (LOS) D as its minimum performance standard which is used for land use applications. While this measurement once appropriately served city needs, recent "on the ground" unintended, adverse and irrevocable consequences for regional growth impact have revealed the need for revisions. Transportation funding constraints has contributed to problems.

The unintended consequences can best be explained by regional events that occurred over a decade ago. During that period of high demand for urban housing and employment, the city's LOS D performance measure (combined with funding limitations for the South Medford Interchange) constrained Medford's ability to sufficiently meet its share of regional housing and employment growth. As a result, a significant part of the growth that would have normally occurred in Medford was instead met in neighboring communities. However, because Medford was and remains the regional center, the result of its constricted growth was greater commuting times, air contaminant discharges and fuel consumption. Such consequences are not easily reversed and are expensive to mitigate.

Medford funds new transportation capacity to meet the transportation impacts of local and regional growth is through the collection of Street System Development Fees (SSDC's) for new development, while funding for the maintenance of existing streets is from monthly utility fees. Regional demand that *cannot be met* in Medford due to excessively strict performance measures also constrains local funding for needed transportation improvements.

This situation is by no means unique to the City of Medford. The following amendments made by the State of Oregon recognize that local governments may need to adopt flexibility into their transportation plans to manage the transportation system to limit the consequences associated with performance measure and funding limitations. This State document provides language that can be incorporated into the city's TSP. These appear to provide implementation language well suited to meet a number of expressed Council objectives for this TSP update.

Goal 1 - Plan, manage and invest comprehensively and strategically.

Provide a transportation system that serves a range of transportation modes while enhancing the City's public health and safety, economic vitality, and community livability.

Objective 1: Provide a street network that is safe, convenient, and attractive for all users traveling by foot, bicycle, transit or automobile.

Action Items:

1-a: Ensure the City's Level of Service (LOS) "?" standards are maintained along arterial and collector roadways during peak travel periods; signal timing and other best practices that minimize lane expansions should be pursued prior to roadway expansion.

The following selected excerpts from the Transportation Planning Rule — OAR 660-012-0060 (11) and (11) (b) — as amended in January 2012 — appears to provide the City substantial flexibility *provided that the TSP update properly incorporates such flexibility*. The provisions provide that a “balancing test” may sometimes be employed to allow for partial mitigation under qualifying circumstances. The TSP should explicitly authorize the City's use of this provision and the balancing test it establishes.

(11) A local government may approve an amendment with partial mitigation as provided in section (2) of this rule if the amendment complies with subsection (a) of this section; the amendment meets the balancing test in subsection (b) of this section....

(11) (b) A local government may accept partial mitigation only if the local government determines that the benefits outweigh the negative effects on local transportation facilities and the local government receives from the provider of any transportation facility that would be significantly affected written concurrence that the benefits outweigh the negative effects on their transportation facilities.

If the city agrees that under certain circumstances, it might be appropriate to only require a needed transportation improvement to be partially (rather than fully) mitigated, the city might also consider establishing various “tests” to guide when partial mitigation is available. For instance, the city might provide that only the partial mitigation of transportation impacts is acceptable when it will produce or retain employment. There are likely several other circumstances under which only partial mitigation would be desirable. These should be identified and incorporated into the TSP.

Additionally, OAR 660-012-0060(6) (a) and (b)¹ acknowledges that traffic impacts are reduced by certain kinds of mixed-use development and provides for a reduction in the calculated traffic impacts. Many Medford development projects are of a mixed-use nature and this flexibility — like those mentioned above for OAR 660-012-0060(11) — should be written into the TSP so flexibility is enabled and can be used as appropriate.

¹ OAR 660-012-0060(6)(a) Absent adopted local standards or detailed information about the vehicle trip reduction **benefits of mixed-use, pedestrian-friendly development**, local governments shall assume that uses located within a mixed-use, pedestrian-friendly center, or neighborhood, will generate **10% fewer daily and peak hour trips than are specified in available published estimates, such as those provided by the Institute of Transportation Engineers (ITE) Trip Generation Manual** that do not specifically account for the effects of mixed-use, pedestrian-friendly development. The 10% reduction allowed for by this section shall be available only if uses which rely solely on auto trips, such as gas stations, car washes, storage facilities, and motels are prohibited; (emphasis added)

(b) Local governments shall use detailed or local information about the trip reduction benefits of mixed-use, pedestrian-friendly development where such information is available and presented to the local government. Local governments may, based on such information, allow reductions greater than the 10% reduction required in subsection (a) above; In addition, recent stabilized transit funding creates a sustainable VMT reduction asset. Coordination with and possible incorporation of RVTD's Strategic Plan should also be considered.

The desirable areas of flexibility noted above are best implemented by making explicit in the TSP that such flexibility is available.

Thank you for the opportunity to comment. My comments are not intended to be exhaustive, but indicative of available implementation policies that the City should consider as part of this TSP update/amendment.

MONTERO & ASSOCIATES, LLC



Michael A. Montero
President

MAM/c

cc File



Planning Department

Working with the community to shape a vibrant and exceptional city

MEMORANDUM

Subject Transportation System Plan – Bicycle and Pedestrian Level of Traffic Stress

File no. CP-16-036

To Planning Commission

From Kyle Kearns, Planner II

Date December 6, 2017

LEVEL OF TRAFFIC STRESS OVERVIEW

Similar to level of service (LOS), level of traffic stress (LTS) is a measurement for how well a transportation facility functions. Whereas LOS measures the operations of stopped controlled intersections on a graduated scale from A through F, LTS measures the level at which pedestrians and bicyclist experience stress on a transportation facility on a graduated scale of LTS 1 through LTS 4. Currently the City of Medford does not recognize LTS as a standard as the level of traffic stress analysis was not performed or adopted into code for the previous TSP from 2004. The intent of this memo is to provide information regarding LTS and to outline potential next steps for its application within the Transportation System Plan and the City of Medford.

MEASURING LEVEL OF TRAFFIC STRESS

The Oregon Department of Transportation (ODOT) has adopted the criteria used for measuring LTS and it can be viewed in the Analysis Procedures Manual (APM).¹ Within the APM the methodologies for measuring both bicycle level of stress (LTS) and pedestrian level of stress (PLTS) are outlined separately. However, ODOT encourages that both analyses be done concurrently, and in the case of Medford’s 2038 TSP update, both LTS and PLTS were analyzed at the same time. Each LTS is briefly summarized within this memo. For a “cheat sheet” on how LTS and PLTS is measured, see Exhibit A.

Bicycle Level of Traffic Stress (LTS)¹

Once the analysis of the bicycle network is performed, each segment of the network is assigned an LTS rating. The LTS rating is determined using several factors, which include: posted roadway speed, roadway width, presence and width of bike lane, and presence and width of parking lane. The outcome of the analysis determines the rating for each roadway and multi-use path within the City, assigning a rating to each direction the road

or path travels in. ODOT also recognizes four types of bicycle riders often paired with the LTS analysis, and together one can begin to understand the implications of the different levels of LTS. The four distinct riders/LTS categories are:

Bicycle LTS Classifications

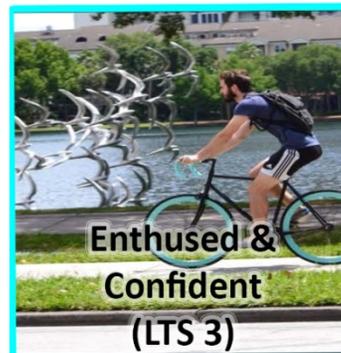
LTS 1: Traffic stress is considered low. Facilities require little attention and are suitable for all cyclists. Traffic speeds are low with no more than one lane in each direction. Children age 10 and up can adequately use LTS 1 facilities, which include residential streets and some separated facilities.

LTS 2: Facilities with little stress but need more attention than an LTS 1 facility. Speeds are still low, with a maximum of three travel lanes in both directions. LTS 2 facilities are suitable for teenagers and up. Typical facilities include low speed collectors with bike lanes or central business districts.

LTS 3: Traffic stress is considered moderate on LTS 3 facilities, allowing for up to five travel lanes in both directions and moderate traffic speeds. Facilities with an LTS of 3 are suitable for observant adult cyclist. Typical facilities include low-speed arterials with bike lanes or moderate speed, non-multilane roadways.

LTS 4: Traffic stress is considered high and typical users of these facilities are skilled cyclist only. Speeds are moderate to high, with two to over five lanes in both directions. Typical facilities include high-speed roadways with narrow or no bike lanes.

Types of Riders



Source: Dill & McNeil, PSU

Pedestrian Level of Traffic Stress (PLTS)¹

Much like LTS, PLTS is a measurement of the stress experienced by pedestrians while using pedestrian facilities, particularly sidewalks or multi-use paths. Where bicycle level of traffic stress can be paired with defined user groups, pedestrian level of traffic stress blankets all users into one grouping, that of the pedestrian. PLTS is separated into four distinct rankings, on a graduated scale of PLTS 1 through PLTS 4.

To determine PLTS the analysis considers roadway posted speed, roadway width (# of lanes), sidewalk width, sidewalk condition, buffer type, buffer width, and land use. Certain factors may be trumped by others; for example a roadway may have a low posted speed (25 MPH), a tree buffer, and a residential land use (all PLTS 1 & 2 factors) but the condition of the sidewalk is in complete disrepair with cracks, roots, and uneven pavement assigning a PLTS 4 to the facility. The four levels of PLTS and the types of facilities that would receive the ranking are:

PLTS 1: Facilities with little to no traffic stress suitable for all users, including children under 10 and people using wheeled mobility devices (WhMD)². A buffer between the pedestrian and motor vehicle must be present and either traffic speeds must be low or motor vehicles must be far from the pedestrian. Some examples include separated multi-use paths or sidewalks adjacent to buffers with a minimum 10 foot width.



Low roadway speeds, bike lanes and parking in between the sidewalk and the road, and sidewalk width all attribute to the PLTS rating of 1.

PLTS 2: Facilities will have little traffic stress, but require more attention than a PLTS 1 facility. All users should be able to use a PLTS 2 facility, with some limitations for children under 10 and people with WhMD. Roadways will have higher speeds or volumes, but most users are comfortable using them. Facilities are similar to PLTS 1 facilities but may have a smaller buffer and/or sidewalk widths or are in higher traffic volume areas.



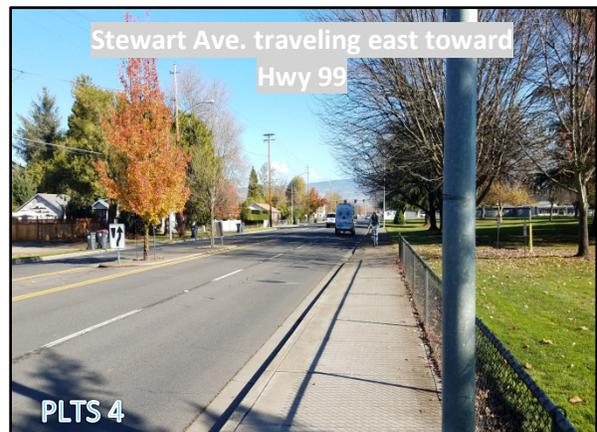
Low roadway speeds, surrounding land uses, sidewalk width and the bike lane in between the sidewalk and roadway give this a PLTS of 2.

PLTS 3: Facilities are considered to have moderate stress and are suitable for adults. Even the most capable of adults would feel uncomfortable, but safe using a PLTS 3 facility. Individuals using a WhMD may find portions of a PLTS 3 facility impassable requiring the use of a bike lane, travel lane, or shoulder to continue travel along the facility. Examples of PLTS 3 facilities include sidewalks adjacent to a five foot buffer along a five lane road or a curb tight sidewalk along a 35 MPH road.



Higher roadway speeds, small buffer widths, lack of items in buffer, surrounding land uses, and sidewalk condition contribute to a PLTS 3.

PLTS 4: Facilities will have a high level of traffic stress and are typically only used by able-bodied adults, with limited route choices along the facility. Traffic speeds are moderate to high along a PLTS 4 facility and often have narrow or no pedestrian facilities provided. Use of these roadways is often driven by need more than desire. Examples include moderate/high speed roads without a sidewalk or freeway interchanges.



High roadway speeds, no buffers, sidewalk gaps, curb tight sidewalks, and sidewalk condition contribute to a PLTS 4 on all of Stewart Ave.

USING LEVEL OF TRAFFIC STRESS AS A TOOL

Having only been released in May of 2012³, the level of traffic stress analysis is still new and has yet to receive a wide application. Jackson County uses the bicycle level of traffic stress analysis in their TSP to locate deficient facilities, but beyond the analysis only policy suggestions were made in regard to LTS. Some Oregon cities that have used the LTS analysis in their adopted TSP include West Linn and The Dalles; some other cities are in the process of performing the analysis such as Gladstone, Brookings, and Gresham. The use of PLTS has yet to receive any notable consideration within a TSP.

Staff reviewed the potential applications of both the bicycle and pedestrian LTS analysis and the implications for the 2018-2038 TSP Update. A map of the LTS analysis can be found in Exhibit B and a map of the PLTS analysis can be found in Exhibit D.

Bicycle and Pedestrian LTS as a Tool

Within the draft 2018-2038 TSP Update bicycle LTS is used to help identify the most critical deficiencies in the bicycle system as well as to prioritize the needs of the bicycle network. Exhibit B includes the LTS analysis used in the TSP to identify these aforementioned deficiencies. The LTS analysis enables an objective review of the perceived safety of a roadway for bicycle users; as such the LTS analysis has been used to aid in the drafting of the bicycle project list and aspirational bicycle network goals. The Bicycle Improvement Needs for Low-Stress Connection (Exhibit C) map shows the suggested facilities for achieving a system wide network with an LTS of 2. This map was used to aid in prioritizing bicycle projects to the Tier 1 list as well as identifying system wide needs for the future.

ODOT adapted the bicycle level of traffic stress analysis to apply it to pedestrian facilities as well, which is provided for in the APM.¹ PLTS is used to identify the most critical deficiencies in the pedestrian network, much like LTS. The analysis of Medford's pedestrian network was performed and mapped; however it was not provided for in the draft TSP. A PLTS 2 is considered a minimum target for pedestrian facilities as most users would be comfortable using it. Higher levels of traffic stress may be acceptable in areas depending on land use, traffic volumes, roadway classification, and population types.

LTS differs in application from level of service (LOS). Currently, LOS is used in a manner that requires development to maintain an LOS that meets the City's standard at stop controlled intersections. However, LOS only applies to automobile traffic thus creating inconsistencies when measuring other transportation modes and how they are impacted by development. Currently, Medford does not recognize LTS as a method for determining transportation infrastructure adequacy upon development. When considering LTS or PLTS for policy implementation, achieving an LTS 2 is the most realistic standard as it would reach a broader audience of users. Some possible applications of LTS and PLTS include:

- Incorporate PLTS analysis into TSP
- Require an LTS/PLTS 2 for all development, when applicable
 - o Greenfield, infill especially
- Focus on LTS/PLTS 2 in specific geographic locations or corridors
- Ensure roadway cross-sections achieve LTS/PLTS 2 standard

EXHIBITS

A: BLTS and PLTS Cheat Sheet

B: Bicycle Level of Traffic Stress Analysis Map

C: Bicycle Improvements Map (to achieve LTS 2)

D: Pedestrian Level of Traffic Stress Analysis Map

Sources

¹ Oregon Department of Transportation, Transportation Development Division, Planning Section, Transportation Planning Analysis Unit. "Analysis Procedures Manual Version 2." Sept. 2017. www.oregon.gov/ODOT/Planning/Documents/APMv2.pdf.

² A wheeled mobility device (WhMD) includes walkers, manual wheelchairs, power base chairs, and light weight scooters. Each of these devices requires the operator to maneuver and set the direction of travel. All of these devices can be operated independently and do not require additional people to maneuver the device. The American with Disability Act (ADA) (1990) sets limits on the vertical change in a surface to 0.5 inches.

³ Mekuria, Maaza C., et al. Low-Stress Bicycling and Network Connectivity. Mineta Transportation Institute, College of Business, San Jose State University, 2012, transweb.sjsu.edu/project/1005.html.

Exhibit A

BLTS and PLTS Cheat Sheet

Bicycle Level of Traffic Stress

Assumptions and Scoring

Non-residential streets in the City of Medford (ranging from Commercial Streets to Major/Regional Arterials) were assigned a bicycle level of traffic stress (BLTS) score. The methodology for assigning BLTS scores to Medford Streets was based on Chapter 14 of Oregon Department of Transportation's (ODOT) Analysis Procedure's Manual (APM)¹. BLTS scores are based on a range of criteria, including:

- Posted speed
- Roadway width
- Presence and width of a bike lane
- Presence and width of a parking lane

A combination of GIS data provided by the City and Jackson County (roadway speeds, roadway functional classification, bicycle facilities) and manual data collected using aerial imagery from Google Earth (roadway widths, bike lane widths and parking facilities and widths) was used to determine appropriate BLTS scores. BLTS scores were assigned to both sides of each street to provide a more detailed depiction of barriers and opportunities for bicyclists travelling in Medford.

The following tables list the scoring criteria used to assign BLTS roads to Medford Streets. **Table 1** details the criteria used for streets with both a bike lane and adjacent parking lane. **Table 2** details the criteria used for streets with a bike lane and without an adjacent parking lane. **Table 3** details the criteria used for streets where cyclists must travel in mixed traffic (no bicycle facilities available). **Table 4** details the assumptions used to score future (unbuilt) streets in Medford's network.

A key efficiency offered by the BLTS analysis is that it follows the "weakest link principle", in which the dimension with the worst level of traffic stress governs. For instance, a roadway with a posted speed of 30 miles per hour and three travel lanes per direction will receive an LTS score of 4, overriding the lower stress value of the speed component.

¹ Oregon Department of Transportation. *Analysis and Procedures Manual Version 2*. February 2017.

Table 1: Bike Lane with Adjacent Parking Lane Criteria (ODOT APM - Chapter 14 - Exhibit 14-3)

1 Lane Per Direction				≥ 2 Lanes per direction ¹	
Prevailing or Posted Speed	≥ 15' bike lane + parking	14' - 14.5' bike lane + parking	≤ 13' bike lane + parking or Frequent blockage ²	≥ 15' bike lane + parking	≤ 14.5' bike lane + parking or Frequent blockage ²
≤ 25 mph	LTS 1	LTS 2	LTS 3	LTS 2	LTS 3
30 mph	LTS 1	LTS 2	LTS 3	LTS 2	LTS 3
35 mph	LTS 2	LTS 3	LTS 3	LTS 3	LTS 3
≥ 40 mph	LTS 2	LTS 4	LTS 4	LTS 3	LTS 4

¹Streets with two-way left turn lanes were assumed to have 2 lanes per direction

²Typically occurs in urban areas (i.e. delivery trucks, parking maneuvers, stopped buses)

Table 2: Bike Lane without Adjacent Parking Lane Criteria (ODOT APM - Chapter 14 - Exhibit 14-4)

1 Lane Per Direction					≥ 2 Lanes per direction ¹	
Prevailing or Posted Speed	≥ 7' (buffered bike lane)	5.5' - 7' bike lane	≤ 5.5' bike lane	Frequent bike lane blockage ²	≥ 7' (buffered bike lane)	< 7' bike lane or frequent blockage ²
30 mph	LTS 1	LTS 1	LTS 2	LTS 3	LTS 1	LTS 3
35 mph	LTS 2	LTS 3	LTS 3	LTS 3	LTS 2	LTS 3
≥ 40 mph	LTS 3	LTS 4	LTS 4	LTS 4	LTS 3	LTS 4

¹Streets with two-way left turn lanes were assumed to have 2 lanes per direction

²Typically occurs in urban areas (i.e. delivery trucks, parking maneuvers, stopped buses)

Table 3: Urban/Suburban Mixed Traffic Criteria (ODOT APM - Chapter 14 - Exhibit 14-5)

Prevailing or Posted Speed	Unmarked Centerline	1 lane per direction	2 lanes per direction ¹	3+ lanes per directions
≤ 25 mph	LTS 1	LTS 2	LTS 3	LTS 4
30 mph	LTS 2	LTS 3	LTS 4	LTS 4
≥ 35 mph	LTS 3	LTS 4	LTS 4	LTS 4

¹Streets with two-way left turn lanes were assumed to have 2 lanes per direction

Table 4: Future Streets - Assumptions

Functional Classification	Assumed Speed	Lanes per Direction ¹	Bike Lane ¹	Buffer ¹	Parking ¹	BLTS ¹
Major Arterial	40 mph	3	5'	3'	-	3
Regional Arterial	40 mph	3	5'	3'	-	3
Minor Arterial	35 mph	2	5'	3'	-	2
Major Collector	30 mph	2	5'	-	-	3
Minor Collector	30 mph	1	5'	-	7'	3
Commercial ²	30 mph	1	-	-	7'	2

¹Per Updated Functional Classification Cross Sections for the City of Medford

²LTS Score assumes that Commercial Streets have unmarked centerlines - a centerline would increase the score to an LTS 3

Pedestrian Level of Traffic Stress

Assumptions and Scoring

Non-residential streets in the City of Medford (ranging from Commercial Streets to Major/Regional Arterials) were assigned a pedestrian level of traffic stress (PLTS) score. The methodology for assigning PLTS scores to Medford Streets was based on Chapter 14 of Oregon Department of Transportation’s (ODOT) Analysis Procedure’s Manual (APM). PLTS scores are based on a range of criteria, including:

- Posted Speed
- Roadway Width
- Sidewalk Width
- Sidewalk Condition
- Buffer Type
- Buffer Width

A combination of GIS data provided by the City and Jackson County (roadway speeds, roadway functional classification and sidewalk location) and manual data collected using aerial imagery from Google Earth (roadway width, sidewalk width/condition and buffer width/type) was used to determine appropriate PLTS scores. PLTS scores were assigned to both sides of each street to provide a more detailed depiction of barriers and opportunities for pedestrians travelling in Medford.

The following tables list the scoring criteria used to assign PLTS roads to Medford Streets. **Table 5** details the criteria used to assign scores based on sidewalk width and condition. **Table 6** details the criteria used to assign scores based on buffer type and roadway speed. **Table 7** details the criteria used to assign scores based on roadway speed and buffer width. **Table 8** details the assumptions used to score future (unbuilt) streets in Medford’s network.

A key efficiency offered by the PLTS analysis is that it follows the “weakest link principle”, in which the dimension with the worst level of traffic stress governs. For instance, a roadway with a posted speed of 40 miles per hour, a brand new six-foot sidewalk and no buffer (curb tight) will receive an LTS score of 4, overriding the lower stress value of the sidewalk condition component.

Table 5: Sidewalk Condition (ODOT APM - Chapter 14 - Exhibit 14-16)

Actual/Effective Sidewalk Width (ft.) ¹		Sidewalk Condition				
		Good	Fair	Poor	Very Poor	No Sidewalk
Actual	< 4'	PLTS 4	PLTS 4	PLTS 4	PLTS 4	PLTS 4
	≥ 4' to < 5'	PLTS 3	PLTS 3	PLTS 3	PLTS 4	PLTS 4
	≥ 5	PLTS 2	PLTS 2	PLTS 3	PLTS 4	PLTS 4
Effective	≥ 6 ²	PLTS 1	PLTS 1	PLTS 2	PLTS 3	PLTS 4

¹Effective width is the available/usable area for the pedestrian. Does not include areas occupied by store fronts or curbside features.

²Effective width should be proportional to volume since higher volume sidewalks should be wider than the base six feet. Use a minimum PLTS 2 for higher volume sidewalks that are not proportional.

Table 6: Physical Buffer Type (ODOT APM - Chapter 14 - Exhibit 14-17)

Physical Buffer Type				
Buffer Type ¹	Prevailing or Posted Speed			
	≤ 25 mph	30 mph	35 mph	≥ 40 mph
No Buffer (curb tight)	PLTS 2	PLTS 3	PLTS 3	PLTS 4
Solid Surface	PLTS 2 ²	PLTS 2	PLTS 2	PLTS 2
Landscaped	PLTS 1	PLTS 2	PLTS 2	PLTS 2
Landscaped with trees	PLTS 1	PLTS 1	PLTS 1	PLTS 2
Vertical	PLTS 1	PLTS 1	PLTS 1	PLTS 2

¹Combined Buffers: If two or more of the buffer conditions apply, use the most appropriate, typically the lower stress level.

²If street furniture, street trees, lighting, planters, surface change etc. are present then the PLTS can be lowered to PLTS 1.

Table 7: Total Buffering Width (ODOT APM - Chapter 14 - Exhibit 14-18)

Total Number of Travel Lanes (both directions)	Total Buffering Width (ft.) ¹				
	<5	≥ 5 to < 10	≥ 10 to < 15	≥ 15 to < 25	≥ 25
2	PLTS 2	PLTS 2	PLTS 1	PLTS 1	PLTS 1
3	PLTS 3	PLTS 2	PLTS 2	PLTS 1	PLTS 1
4 to 5	PLTS 4 ²	PLTS 3	PLTS 2	PLTS 1	PLTS 1
6	PLTS 4 ²	PLTS 4 ²	PLTS 3	PLTS 2	PLTS 2

¹Total buffering width is the summation of the width of buffer, width of parking, width of shoulder and width of the bike lane on the same side of the roadway as the pedestrian facility is being evaluated.

²Sections with a substantial physical barrier/tall railing between the travel lanes and the walkway can be lowered to PLTS 3.

Table 8: Future Streets – Assumptions

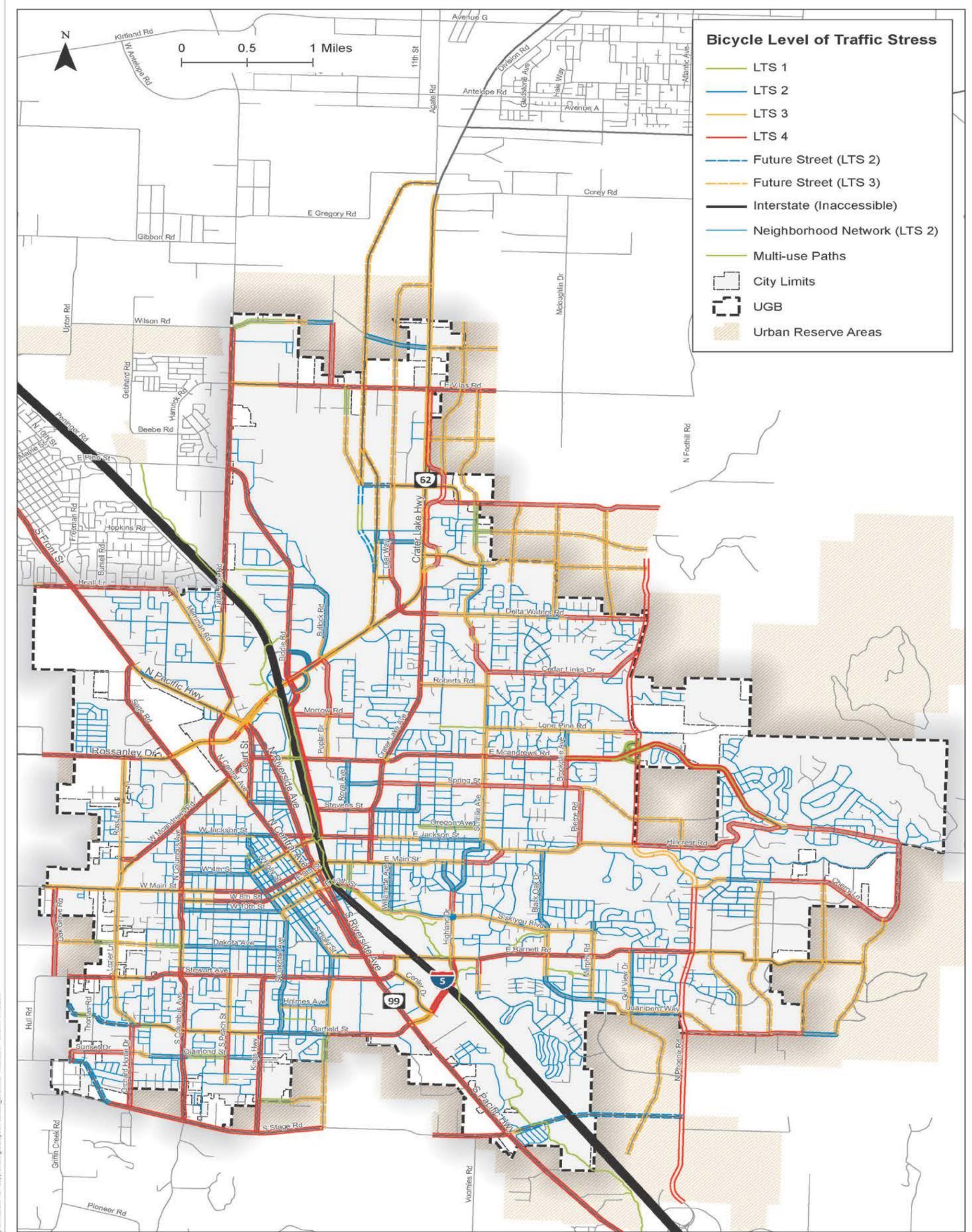
Functional Classification	Assumed Speed	Sidewalk Width ¹	Sidewalk Condition ¹	Buffering Width ¹	Travel Lanes	Buffer Type ¹	PLTS ¹
Major Arterial	40 mph	5'	Good	18'	5	Landscape + Trees	2
Regional Arterial	40 mph	5'	Good	18'	5	Landscape + Trees	2
Minor Arterial	35 mph	5'	Good	18'	3	Landscape + Trees	2
Major Collector	30 mph	5'	Good	15'	3	Landscape + Trees	2
Minor Collector	30 mph	5'	Good	20'	2	Landscape + Trees	2
Commercial ²	30 mph	5'	Good	15'	2	Landscape + Trees	2

¹Per Updated Functional Classification Cross Sections for the City of Medford

Chapter 14 of the APM includes an additional set of scoring criteria in its PLTS Methodology: General Land Use. The General Land Use criteria takes into account the effects that adjoining land uses can have on the walkability and desirability of certain facilities for pedestrians. While the General Land Use Criteria provides insights into areas that may be more or less friendly to pedestrians, it doesn't provide direct insight into the role that the Medford TSP could play in improving PLTS in the City. Consequently, the project team made the decision to omit the General Land Use criteria from the PLTS analysis of Medford Streets.

Exhibit B

Bicycle Level of Traffic Stress Analysis Map



**Bicycle Level of Traffic Stress
 Medford, Oregon**

**Figure
 2**

Coordinate System: NAD 1983 StatePlane Oregon South FIPS 3602 Feet



Exhibit C
Bicycle Improvements Map
(to achieve LTS 2)

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Figure 8 Bicycle Facility Improvement Needs for Low-Stress Connection

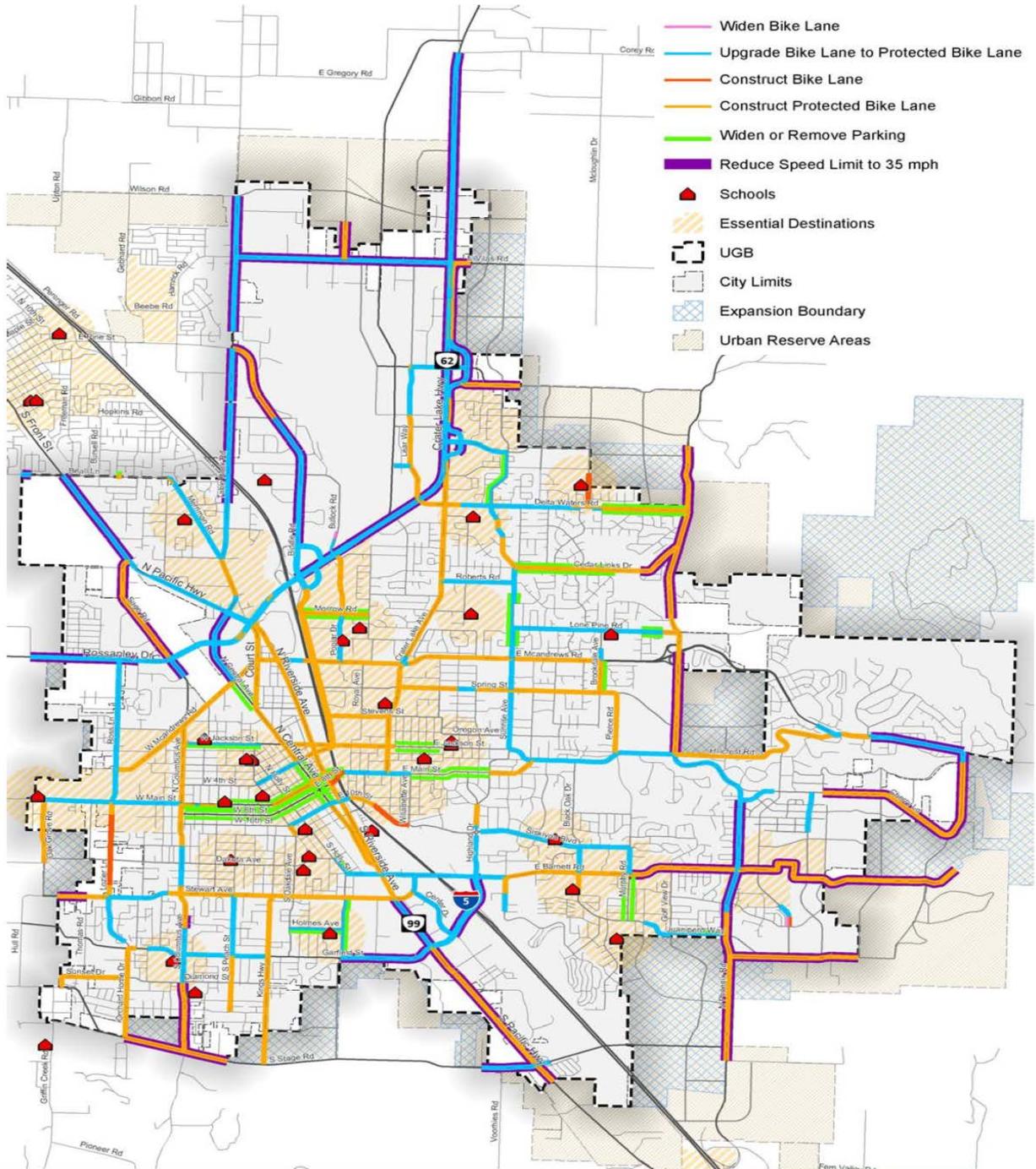
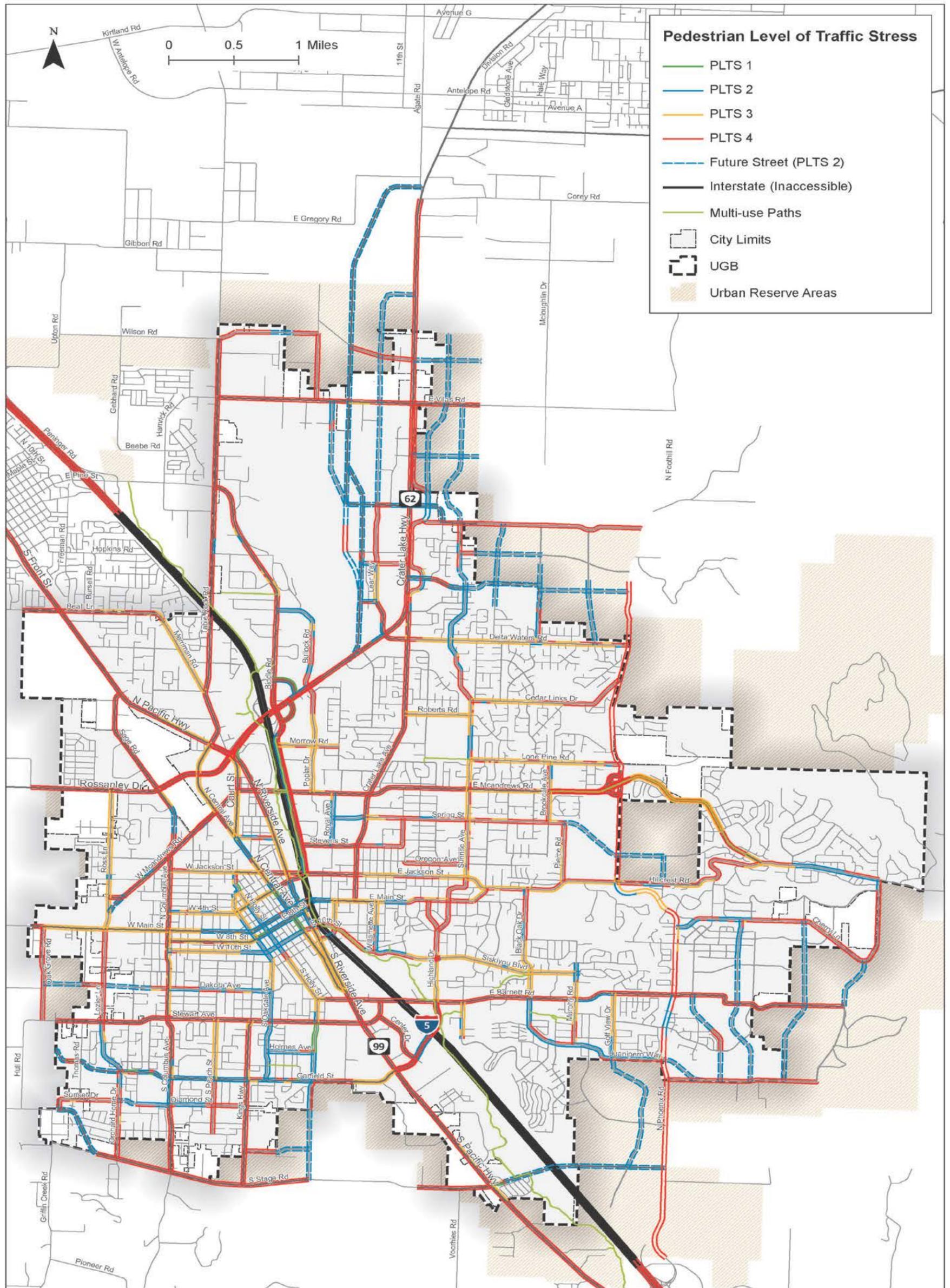


Exhibit D

Pedestrian Level of Traffic Stress Analysis Map



**Pedestrian Level of Traffic Stress
 Medford, Oregon**

**Figure
 2**

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Coordinate System: NAD 1983 StatePlane Oregon South FIPS 3602 Feet