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Memo

Date: August 24, 2006
To: Randal Thomas
From: Smith Siromaskul - OBDP Mobility
RE: Region 1 Mobility Thresholds

This memo serves as an addendum to the March 15, 2005 and April 25, 2005 memos that discuss the corridor delay thresholds proposed by OBDP to be included in the revised Corridor-Level TMPs for I-5 North, I-5 South, I-84 and US 26/97. This memo specifically addresses issues regarding the corridor delay thresholds for segments located within Region 1.

SUMMARY

Traffic patterns in Region 1 are different than the rest of the state. The levels of existing congestion in the Portland metropolitan area are unmatched anywhere else in the state. The heavy commuter influence on traffic patterns within the Portland metro area of Region 1 make it prudent to resegment the portions of the primary OTIA III corridors to allow the sections that are heavily influenced by Portland commuter traffic to become their own segments. Separating these segments from the rest of the corridors allows these segments to be managed in a different way that accounts for the characteristics that make them unique within the state.

The concept of delay thresholds that is being applied to the primary OTIA III corridors in the state is not appropriate for Region 1. The delay thresholds are too restrictive to allow necessary work to be completed. Using travel time as the threshold for the purposes of mobility management is restrictive enough to prohibit lane closures during peak hours while allowing additional flexibility during off-peak hours. *This will not change the current practice of the Region to limit work to overnight hours under almost all circumstances.* The peak travel time will be the travel time threshold during these hours.

KEY CORRIDORS WITHIN REGION 1

Draft Corridor-Level TMPs have been developed for each of four identified corridors as part of the OTIA III Program. Sections of three of the four corridors are located in Region 1. These three corridors include:

- US 26/97
- I-84
- I-5 North/OR 58

It is recognized that other highway corridors in the state will also play a key role in managing traffic mobility for Oregon's traveling public and trucking industry. Although Corridor-Level TMPs have not been developed for these routes, it is recognized that construction activities in these corridors will need to be coordinated with construction activities in the key OTIA III corridors to ensure that statewide mobility goals are achieved. This coordination will occur as

part of Corridor Mobility Committee and the Region 1 Mobility and Operations Committee activities.

REVISED CORRIDOR SEGMENTATION

Each OTIA III corridor was segmented to allow more refined analyses to be conducted during the development of the TMP and to better facilitate monitoring and evaluation of corridor performance during construction. The tables below summarize the segments for each corridor. The segments were selected with consideration of traffic volumes, population centers, roadway characteristics, segment lengths, and travel patterns.

A key reason for this memo is the recognition that traffic patterns and volumes in and near the Portland metropolitan area behave differently than the rest of the state. The level of existing congestion is higher than any other location in the state. The roadway users in the Portland metro area expect and tolerate more significant impacts to travel time from construction projects than drivers in other portions of the state.

Staging opportunities that may be present in other areas may not exist in the urban setting found in Portland. There is less room for diversion structures that would allow for maintaining the ideal number of travel lanes. In general, there is less flexibility in staging in the urban and suburban settings in the Portland metro area.

Other major differences in the Portland metro area include the heavy commuter influence on traffic patterns; minimal influence of seasonal variations; increased directional distributions; and a higher level of existing congestion.

Each of the three OTIA III corridors that enter Region 1 should be revised to isolate areas on each corridor that are significantly influenced by Portland commuter traffic. The segmentation section in the Corridor-Level TMPs will be revised during a future update to those documents.

US 26/97

Segment 1-A currently covers the expanse on US 26 between I-205 and OR 216 (near northern boundary of the Warm Springs Indian Reservation). This segment actually includes OR 212 from I-205 to the intersection of OR 212 and US 26 near the town of Boring. From that intersection, the US 26/97 corridor follows US 26 southeast to OR 216.

It is recommended that this segment be broken into two subsegments. The first subsegment, 1-A1, should include the entire OR 212 segment. The second subsegment, 1-A2, should include the entire US 26 component of the original segment 1-A.

I-5 North/OR 58

The breakpoint between segment 2-A and 2-B has been changed from OR 217 to the Willamette River Bridge. This coincides with the boundary between Region 1 and Region 2.

I-84

The breakpoint between segments 3-A and 3-B should be changed. The current boundary between these two segments is I-205. The recommended boundary is the East Troutdale

interchange located on the west bank of the Sandy River. This represents the location of a major drop in traffic as I-84 enters the Columbia River Gorge. Commuter traffic generally ends at this location. The revised segment 3-A should then be broken into two components, segment 3-A1 and 3-A2, by creating a new breakpoint at I-205. Traffic congestion west of I-205 is far more severe than congestion east of I-205.

These changes to segmentation on the corridors are meant to create separate segments on each of the three OTIA III corridors that enter Region 1. Segments 1-A1, 2-A, and 3-A now represent the entire length of each corridor (I-5, I-84, and US 26/97) that are located in Region 1 and are heavily influenced by Portland commuter traffic.

The tables below show only the segments on each of the three corridors whose lengths will change as a result of the recommended adjustments to corridor segmentation.

US 26/97 Segmentation

Segment	Highway	Segment Boundaries	Segment Length (Miles)
1-A1	OR 212	I-205 to US 26	12
1-A2	US 26	OR 212 to OR 126	48

I-5 North/OR 58 Segmentation

Segment	Highway	Segment Boundaries	Segment Length (Miles)
2-A	I-5	WA State Line to Willamette River	26
2-B	I-5	Willamette River to OR 22	37

I-84 Segmentation

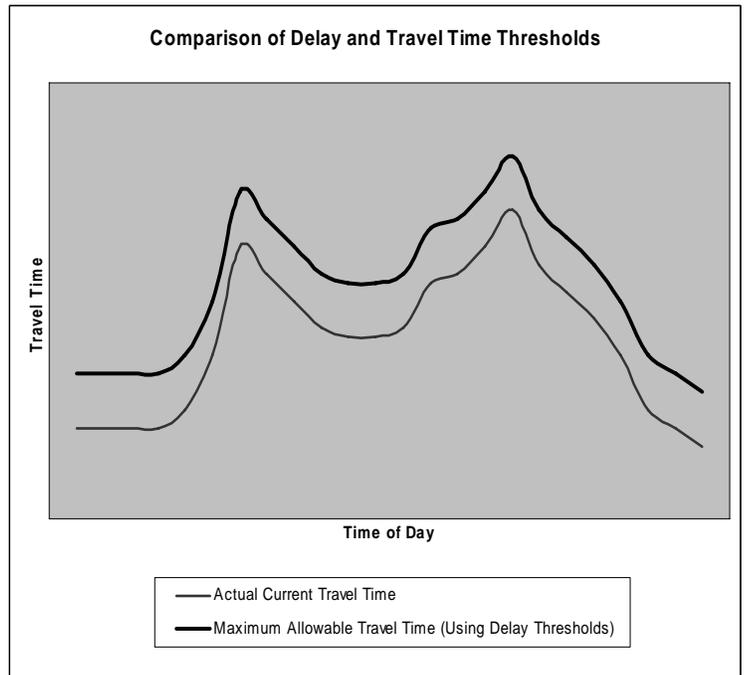
Segment	Highway	Segment Boundaries	Segment Length (Miles)
3-A1	I-84	I-5 to I-205	6
3-A2	I-84	I-205 to Sandy River	12
3-B	I-84	Sandy River to OR 35	46

THRESHOLDS

Each of the primary OTIA III corridors, I-5 North/OR 58, I-5 South, I-84, and US 26/97 have used the concept of thresholds as a tool to assist in managing these corridors to minimize delays to the traveling public and to maximize flexibility in completing the work in a timely manner. These corridors have used *delay* thresholds.

Delay is defined as the additional travel time that will be required to travel from one point to another as a result of construction activities. With this definition, recurring delay that results from existing capacity or geometric deficiencies is excluded. The delay threshold is a constant value throughout the day. Current travel times, accounting for congestion, incidents, weather, etc., fluctuate throughout the day. The maximum allowable travel time equals the sum of the current travel times plus the delay threshold and also fluctuates throughout the day. In the graph to the right, the distance in between the two lines represents the *delay threshold*.

While the delay threshold is being used effectively throughout the state, it is recognized that the existing traffic congestion in the Portland metro area is unique. Traffic volumes make daytime lane restrictions an unappealing option to be avoided whenever possible. Any lane restrictions that take place during the peak commuting hours would have profound impacts that would exceed any reasonable delay threshold that could be set. The resulting diversion to alternate routes would also significantly impact the surrounding roadway network. For these reasons, it has been the regular practice for Region 1 to limit any lane restrictions to the overnight hours.



The current delay thresholds being applied on corridors throughout the state are calculated by taking 10% of the peak non-construction travel time. Using data collected in the Portland metro area, the peak travel times have been collected and are shown in the table below. Also shown is the delay threshold for these segments assuming that the 10% is utilized.

Delay Thresholds using 10% Method

Segment	Segment Boundaries	Area Type	Segment Length (Miles)	Peak Travel Time (Min.)	Calc. Delay Threshold (Min.)
1-A1	OR 212: I-205 to US 26	Urban	12	28	3
2-A	I-5: WA State Line to Willamette River	Urban	26	50	5
3-A1	I-84: I-5 to I-205	Urban	6	28	3
3-A2	I-84: I-205 to Sandy River	Urban	12	17	2

While the recommended adjustments to corridor segmentation made earlier in this document allow for the new segments to share their traffic characteristics and behavior, the segments within the Portland metro area are very short when compared to their statewide counterparts. If the same 10% methodology used elsewhere in the state to determine the appropriate delay threshold were applied in the Portland area, the thresholds would be very low, to the point at which any work, even at night, would violate the segment thresholds.

As such, it is recommended that for corridor management purposes in the Portland metro area, a different approach should be taken. The recommended method must be restrictive enough to prohibit lane restrictions during the day, but not so restrictive that closing two out of three lanes

at a time is possible during the overnight hours to complete necessary work. For certain facilities within Region 1, it is likely, either now or in the near future, that significant delays may be generated if multiple lanes are closed regardless of the time of night. Whatever thresholds are put in place must allow for additional flexibility to incur delay during off-peak hours when their economic and operational impacts will not be as severe as they would be during the peak hours.

Another issue with using delay thresholds in Region 1 is the abundance of alternative routes. For the rest of the OTIA III corridors, travel demand is generally based on regional travel. Due to the topography across the state, regional alternate routes are rarely available for the primary OTIA III corridors. This is not the case in the Portland metro area. Traffic demand can be variable since alternate routes are available and real-time traffic information. These factors can change travel demand significantly on a given roadway. For example, construction or an incident on I-205 that is causing substantial congestion would likely result in diversion of traffic from I-205 that could increase traffic on I-5 and therefore the travel time on I-5. If there is a construction project on I-5 at that time that does not close any lanes, but merely shifts traffic from its normal pattern, the observed increase in travel time may be incorrectly attributed to the I-5 work zone. To make mobility management more straightforward, and remove the issue of interpretation of performance of each facility when compared to the threshold, it is recommended that the thresholds used in Region 1 be based on *travel time*. The recommended *travel time threshold* for each segment is shown in the table below.

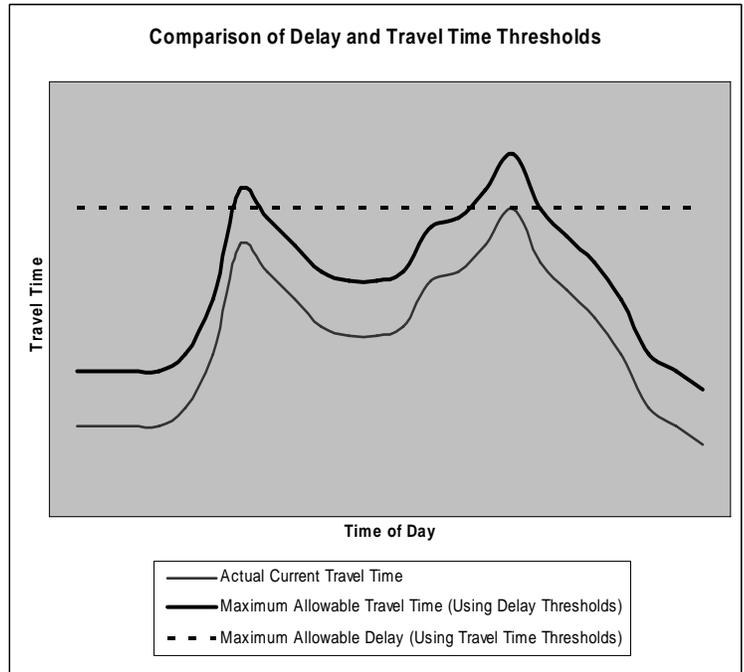
Recommended Travel Time Thresholds

Segment	Segment Boundaries	Area Type	Segment Length (Miles)	Peak Travel Time (Min.)	Travel Time Threshold (Min.)
1-A1	OR 212: I-205 to US 26	Urban	12	28	28
2-A	I-5: WA State Line to Willamette River	Urban	26	50	50
3-A1	I-84: I-5 to I-205	Urban	6	28	28
3-A2	I-84: I-205 to Sandy River	Urban	12	17	17

The recommended travel time threshold represents the maximum allowable travel time through the segment regardless of the time of day. Notice that the travel time threshold is equal to the peak travel time currently observed. In effect, utilizing the existing peak travel time as the travel time threshold reinforces the Region 1’s current practice of restricting work to overnight hours under almost all circumstances.

The graph to the right shows the difference between delay thresholds and travel time thresholds and their impact on the maximum allowable travel time at various times of the day.

It should be noted that though it appears that using travel time thresholds in place of delay thresholds may allow for extremely high construction-related delays during night-time hours, projects taking place in the overnight hours will still have to adhere to ODOT's work zone traffic analysis methodologies, which dictate when lanes should or should not be closed. The methodology bases the allowable work windows on traffic volume levels that do not induce significant delays.



It will still be the practice of the Region to limit work to overnight hours under almost all circumstances and the peak travel time will be the travel time threshold during these hours.

ON-GOING REVIEW AND REFINEMENT OF THE TRAVEL TIME THRESHOLDS

The TMPs are “living documents” and will be subject to on-going review and refinement. Similarly, the travel time thresholds will also be subject to on-going review and refinement.

INTENDED IMPLEMENTATION OF TRAVEL TIME THRESHOLDS IN REGION 1

Per the direct request of the Statewide Mobility Committee, Region 1 was asked to explicitly describe the manner in which the travel time thresholds will be implemented within the Region. The following is from an email from Eileen Phelan, Region 1 Mobility Liaison, dated August 22, 2006:

Region 1 does not as a normal practice close freeway lanes (I-5 or I-84) during weekday daylight hours and/or heavy commute periods for construction or scheduled maintenance activities except for very short-term tasks or those that require daylight/temperature critical activities. This rule is generally extended to expressways, such as the US 26 Sunset Highway or OR 217.