REFERENCE EXAMPLES: LEVEL OF SERVICE ALTERNATIVES

CLARK COUNTY | TRANSPORTATION SYSTEM PLAN SOUNDING BOARD

Clark County's adopted level of service (LOS) standard for street segments and intersections is a volume-to-capacity ratio. This LOS standard measures the volume of vehicle traffic relative to a street or intersection's vehicle capacity.

This document provides a few reference examples for further research on alternatives to this LOS standard, as follow-up to discussion from the July 20, 2021, Transportation System Plan (TSP) Sounding Board meeting. Conversation in the meeting built from slide 36 in the meeting's presentation slidedeck.

Background

The Growth Management Act defines transportation concurrency to mean that necessary improvements are in place at the time of development, or that funding is in place to complete the necessary improvements within six years (RCW 36.70A.070(6), RCW 36.70A.108).

Concurrency programs often drive infrastructure funding decisions. In effect, "you get what you measure."

The Puget Sound Regional Council (PRSC) has a useful planning resource, the *Planning for Whole Communities Toolkit*. To reduce the amount of redirecting to various websites, from this toolkit, I have taken out excerpts of information on Multimodal LOS, Person Capacity vs. Automobile Capacity, and Person Delay. The full Toolkit can be found at the follow link, for more information about multimodal concurrency:
https://www.psrc.org/sites/default/files/mmlos.pdf

Planning for Whole Communities Toolkit (PSRC, 2014)

Multimodal Level of Service (LOS) Standards

Transportation Concurrency - City of Bellingham (cob.org)

Bellingham's Multimodal Transportation Concurrency Program (BMC 13.70) features multimodal level of service (LOS) standards and performance measures that include sidewalks, bike lanes, WTA transit, multiuse recreation trails, as well as vehicles, and is designed to help the City achieve 2016 Comprehensive Plan Transportation Element goals directing infill growth primarily to Urban Villages and to help complete sidewalks and bicycle lanes throughout the City.

American Planning Association Case Study Moving Beyond the Automobile Multi-modal Transportation Planning in Bellingham, Washington

http://www.planning.org/practicingplanner/print/2009/fall/case. (cob.org)

Person Capacity vs. Automobile Capacity

Capacity Plan-Based Transportation Concurrency System - City of Redmond The City of Redmond uses this tool to manage the pace of development while providing transportation improvements for all users, including bicyclists, pedestrians, drivers, and transit riders. The concurrency concept in Redmond is simple – compare system demand to system supply by comparing Transportation Mobility Units (TMU). This approach estimates person demand by mode of travel to the supply (available supply of mobility units) and then uses this comparison to apply the concurrency review process when development occurs.

Figure 1 Redmond Concurrency Concept

Image Source: City of Redmond

Additional information: City of Redmond, "Concurrency Management and Level of Service"
https://www.redmond.gov/DocumentCenter/View/843/AppendixCPDF?bidId=

Person Delay

Another example of multimodal level of service that addresses people as opposed to vehicles is measuring person delay.

This measure uses microsimulation to evaluate the delay per person for each mode of travel at an intersection. This allows for all the various transportation modes to be combined and compared equally. In addition, this microsimulation is conducive to evaluating alternatives in project development. Some benefits of using person delay are that all modes are accounted for (including vehicle and transit occupancy) and it provides insight into how different types of improvements can benefit different modes. This example of person delay is from the UC Davis Campus and from the Fehr and Peers MMLOS Toolkit. Bellingham's Multimodal Transportation Concurrency Program (BMC 13.70) was one of the first in the nation to move beyond traditional auto-oriented level-of-service measurements to assess the adequacy of the citywide transportation network and has been featured in a wide variety of state and national publications.

Pedestrian LOS

The 2010 Highway Capacity Manual (1) (HCM) includes methodologies for calculating Pedestrian Level of Service (PLOS) as part of "Multimodal LOS" analysis. Click this link for more information: Final Report Potential Modification of the HCM Pedestrian Level of Service Model for Arterial Roadways.

The intent of the PLOS score is to provide a way of measuring the perceived levels of safety and comfort of pedestrians walking along a roadway environment. The methodology provides for readily measurable roadway and traffic values to be entered in a model that provides a numerical PLOS value. This numerical score is then translated into a pseudo-academic letter grade scaled from "A" to "F" using the stratification shown in Figure 2. The HCM methodology is essentially the standard for transportation engineering analysis in numerous locations throughout the United States. Figure 2 Pedestrian LOS Numerical Score vs. Letter Grades Numerical LOS Score Letter Grade ≤1.5 A >1.5 and ≤2.5 B >2.5 and ≤3.5 C >3.5 and ≤4.5 D >4.5 and ≤5.5 E >5.5 F There is a perception amongst practitioners that the existing HCM methodology does not provide results that are consistent with actual conditions along a roadway based upon the constituent links and intersections. This project is to develop a model that provides more intuitive results than the existing HCM model. The model is to be developed using a theoretical construct tested against existing evaluations. The results are submitted to a panel of practitioners from the Transportation Research Board Highway Capacity and Quality of Service Committee Pedestrians and Bicycles Subcommittee.

Figure 2 Pedestrian LOS Numerical Score vs. Letter Grades

Numerical LOS Score	Letter Grade
≤1.5	A
>1.5 and ≤2.5	B
>2.5 and ≤3.5	C
>3.5 and ≤4.5	D
>4.5 and ≤5.5	E
>5.5	F

Image Source: Florida Department of Transportation

Clark County current Level of Service Standards

Urban Collector and Arterial Streets inside Vancouver Urban Growth Boundary

- Volume to Capacity Ratio
    - > 0.9 indicates failure

Intersections of Regional Significance outside of Vancouver Urban Growth Boundary

- Two (2) cycle lengths or
- Two hundred forty (240) seconds of delay
- Whichever is less

Defined in CCC 40.350.020.G