

Appendix K

Level of Service Standard and Measurements

Definition

Level of service (LOS) is a mechanism used to determine how well a transportation facility is operating from a traveler's perspective.

Typically, six levels of service are defined and each is assigned a letter designation from A to F, with LOS A representing the best operating conditions, and LOS F the worst.

The Highway Capacity Manual (2010) defines level of service as a quantitative stratification of a performance measure or performance measures that represent quality of service.

Quality of service describes how well a transportation facility or service operates from a traveler's perspective.

Guidance on Establishing Level of Service

- Washington State's Growth Management Act (GMA) (RCW 36.70A.070) requires local jurisdictions to establish LOS standards for all locally owned arterials and transit routes to serve as a gauge to judge performance of the system. These standards should be regionally coordinated.
- The county-wide planning policies for Thurston County state: "The transportation element of each jurisdiction's comprehensive plan will include LOS standards for all arterials and transit routes and services. Each jurisdiction will coordinate these LOS standards with all adjacent jurisdictions. Transit LOS standards will be consistent with Intercity Transit policies."

Regional Level of Service Standards

During the two-hour p.m. peak, the regional LOS standards are as follows:

- LOS E or better in urban centers and corridors.
- LOS D or better elsewhere inside city limits, urban growth boundaries, and rural/urban transition areas.
- LOS C or better elsewhere in rural areas.

Strategy Corridors

Strategy corridors are places where road widening is not a preferred option to address congestion problems. This may be because the street or road is already at the maximum number of lanes, or that adjacent land uses are either fully built out or are environmentally sensitive. In strategy corridors, LOS may exceed adopted standards, suggesting instead that a different approach is needed for maintaining access in these areas.

In urban areas, these approaches can include:

- Increased transit service
- More sidewalks or bicycle facilities
- A complete and connected street grid
- Transportation technology measures that improve system operating efficiency
- Access management
- Parking management
- Incentives for employees to telework or carpool.

In rural areas, alternatives to road widening can include:

- Intersection improvements
- Connections to regional trails
- Extending/increasing transit service

- The *GMA* also directs local jurisdictions to include LOS for state-owned transportation facilities in comprehensive plans, (RCW 47.06 and 47.80), to gauge the performance of the system. The purposes of reflecting LOS standards for state highways in the local comprehensive plan are to monitor the performance of the system, to evaluate improvement strategies, and to facilitate coordination between the county's or city's six-year street, road, or transit program and the Office of Financial Management's 10-year investment program.
- Public Highways and Transportation (RCW 47.80.030) requires that regional transportation plans establish LOS standards for state highways and state ferry routes, with the exception of transportation facilities of statewide significance.
- Washington State Statewide Transportation Planning (RCW 47.06.140) requires the Department of Transportation, in consultation with local governments, to set LOS standards for state highways and state ferry routes of statewide significance.

Measuring Level of Service

There are many ways to measure LOS, with some being more appropriate for different levels of analysis:

1. **Generalized planning**, the broad type of planning application that includes statewide analyses, initial problem identification, and future year analyses.
2. **Conceptual planning**, an analysis performed to support decisions related to design concept and scope.
3. **Operational analysis**, or a detailed analysis of a roadway's present or future LOS. The Highway Capacity Manual identifies methods of performing such an analysis.

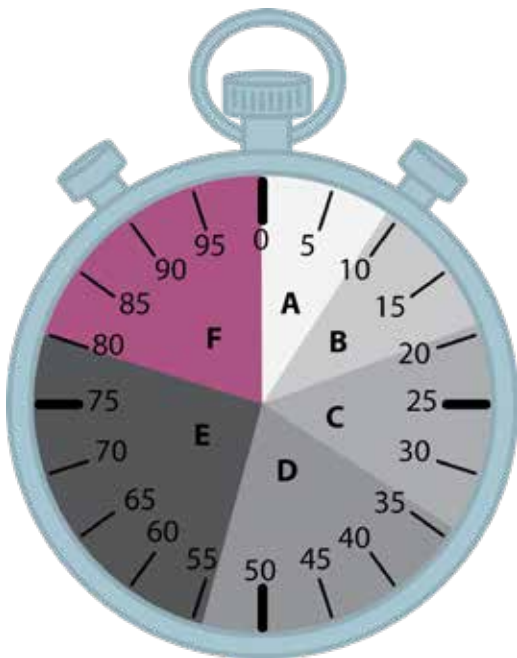
The following examples focus on generalized and conceptual planning, and not operational analysis.

Vehicle Level of Service

Volume-to-capacity (V/C) ratio for traffic can be used for generalized planning, such as that used to identify study areas. When using a V/C ratio, demand or volume (V) is compared to the estimated capacity (C) of each roadway during the evening peak period. The V/C ratio is separated into six levels, and assigned a letter from A to F.

Level of Service	Description	Volume-to-Capacity Ratio
A	Highest driver comfort; free flowing	<.60
B	High degree of driver comfort; little delay	0.60 – 0.70
C	Acceptable level of driver comfort; some delay	0.70 – 0.80
D	Some driver frustration; moderate delay	0.80 – 0.90
E	High level of driver frustration; high levels of delay	0.90-1.00
F	Highest level of driver frustration; excessive delays	>1.00

For conceptual planning, V/C ratios are not adequate measures of quality of service, and other supplemental methods, such as intersection delay, can be used for vehicle LOS. Intersection delay measures the time spent waiting in a signalized intersection.



Intersection Delay is measured in seconds.

Measuring Roadway Level of Service

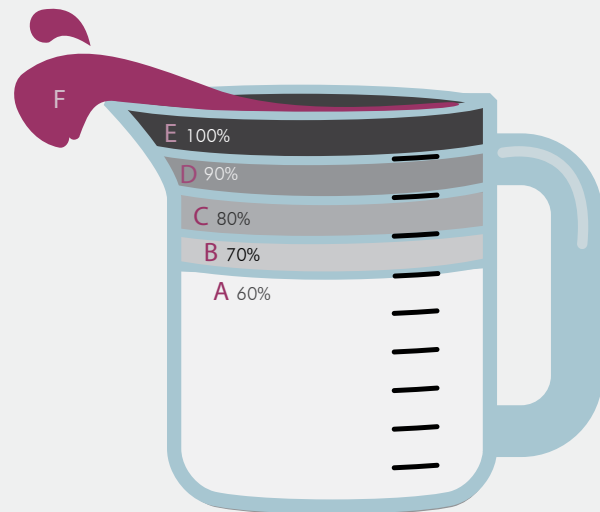
Roadway LOS may be based on a number of factors, including:

- Traffic volume compared to facility capacity
- Travel time
- Multiple variables (e.g. distance traveled, road conditions, safety hazards)

Roadway LOS may be measured at:

- An intersection
- A road segment
- A traffic corridor
- A transportation analysis zone

Local jurisdictions are exploring innovations in level of service for transportation that can take into account overall people-moving performance (multimodal level of service).

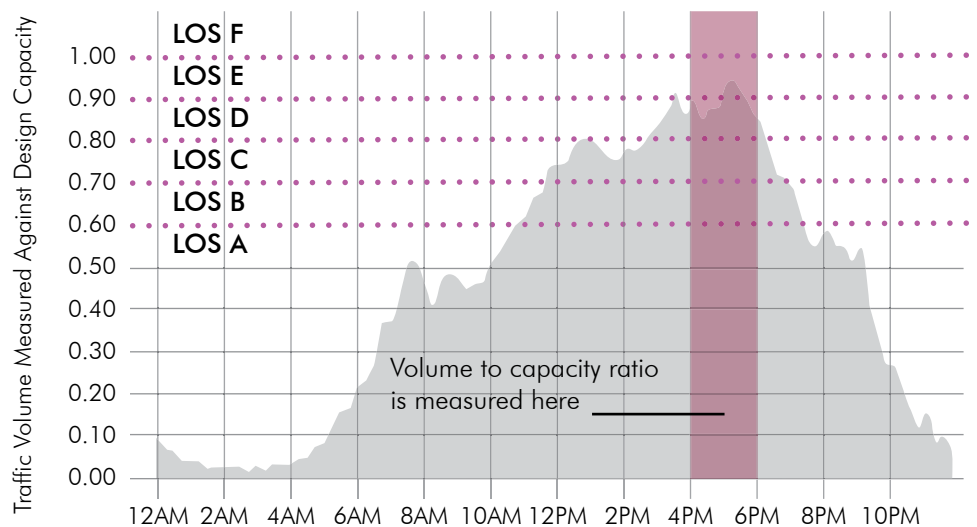


Roadway level of service measures how “full” the roads are.

Two-Hour Roadway Level of Service

The RTP contains a LOS standard for a two-hour p.m. peak level of service. This simply means that measurements of LOS are the average of the two consecutive busiest hours during the afternoon (p.m.) peak travel period (local evening rush hour). A two-hour period is used to accommodate “peak spreading,” the tendency for drivers to shift their commutes out of the busiest period to avoid congestion.

Traffic Volume Measured Against Design Capacity



Source: TRPC.

Applying Regional Level of Service

The Thurston region uses the regional LOS standards for guidance as a minimum standard for local planning efforts, to ensure that local comprehensive plan LOS standards are regionally coordinated. The regional LOS standards are set in consultation with local jurisdictions. The RTP recognizes that the LOS standards for locally-owned arterials and transit routes will be set by local jurisdictions in their local comprehensive plans, and measurement of LOS occurs at the local, not regional, level. In general, local LOS standards will be the same or more stringent than regional LOS standards. If inconsistencies arise, they are resolved in a collaborative process.

A planning LOS evaluation is also used to identify study areas in Chapter 4 Future Conditions. This evaluation is for general planning purposes.

Concurrency

Concurrency is one of the goals of the GMA and refers to the timely provision of public facilities and services relative to the demand for them. To maintain concurrency means that adequate public facilities are in place to serve new development as it occurs or within a specified time period. The GMA gives special attention to concurrency for transportation.

The GMA requires that transportation improvements or strategies to accommodate development impacts need to be made concurrently with land development. “Concurrent with the development” is defined by the GMA to mean that any needed

“improvements or strategies are in place at the time of development, or that a financial commitment is in place to complete the improvements or strategies within six years.” (RCW 36.70A.070(6)(b)). Local governments have flexibility regarding how to apply concurrency within their plans, regulations, and permit systems.

As part of the requirement to develop a comprehensive plan, jurisdictions are required to establish LOS standards (RCW 36.70A.070(6)(a)). Once a jurisdiction sets a LOS, it is used to determine whether the impacts of a proposed development can be met through existing capacity and/or to decide what level of additional facilities will be required.

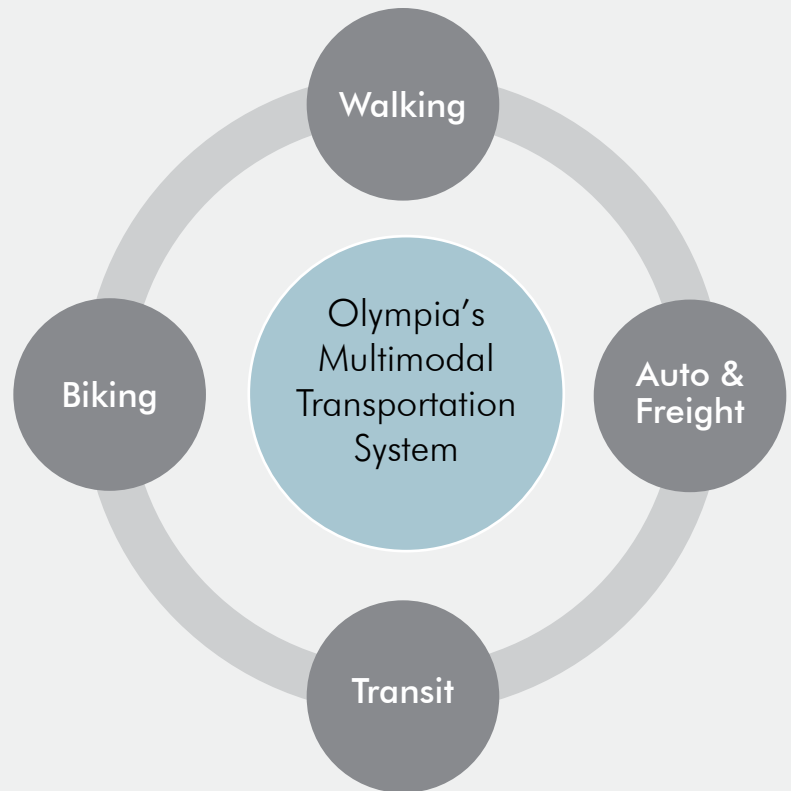
Multimodal Concurrency

Many jurisdictions within Washington State are moving toward multimodal concurrency programs. The City of Olympia, for example, is building a new transportation concurrency program that will formally factor walking, biking, and transit into the transportation system's expansion. This type of multimodal concurrency program assumes that as more people live and work in an area, they may want to travel by walking, biking, and transit. In turn, Olympia's street system should grow in ways to support those modes.

Olympia's new multimodal concurrency program is based on multimodal LOS measures. The specifics and project lists are being developed through their transportation master plan.

- **Walking and Biking.** The measure is how much of the needed infrastructure is in place for people to walk and bike. For example, Olympia's goal is to have sidewalks and bike lanes on all their arterials and collectors.
- **Auto and Freight.** The measure is how congested a corridor is for vehicles.
- **Transit.** The measure is how well buses stay on schedule. Signal modifications are an example of a project that improves the efficiency of buses on Olympia's streets.

This new approach to concurrency reflects Olympia's vision of building a multimodal transportation system. As they grow, they provide people with a wide range of safe and inviting options for getting around.



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