

Reevaluating level-of-service as both a measure and its weight

Why?

Level-of-Service (LOS) has been the dominant performance measure for roadway design, and continues to drive transportation agencies toward overbuilt, expensive, car-oriented highways and sprawling development. No statement encouraging design flexibility and innovation or new design guidance will shift practices away from over-designing roadways unless state DOTs take steps to change expectations around LOS.

Currently, engineers are tasked with finding the ideal solution for every congestion and safety issue, but most DOTs simply do not have the resources to build every large project to address every issue. This is particularly important because there is often a sharp increase of marginal costs for improvements made to keep LOS above a certain threshold at all times. The cost to maintain a LOS B or C through the peak 15 minute period could drive project costs up dramatically, when it may actually be reasonable and acceptable to allow LOS D or F for that small window.

Additionally, the current project development process in many states consider the needs of vehicles, including speculative long-term increases in traffic volume that may not come to pass, without an understanding or discussion with the community about other needs in the corridor. This focus can lead to the development of large, expensive projects that takes a DOT decades to fund and build, drain resources, and may not address the concerns of the community.

There are several options for state DOTs to replace, supplement, or change how they use LOS in design and funding decisions. DOTs can change guidance on LOS applications by (1) relaxing LOS standards in urban/urbanizing contexts, (2) changing the weighting of LOS in comparison to other measures in urban environments, and (3) consider alternative performance measures to LOS, like VMT.

Relax LOS standards and focus on community goals

DOTs should reconsider their priorities around LOS, and provide guidance on how to balance tradeoffs as well as set expectation on what level of improvement is trying to be accomplished. Some key questions that should be asked, but are not often considered, include:

- What are acceptable levels of delay and design guidelines for the many types of modal users, density of land uses, roadway type?
- What problems warrant a multimillion-dollar investment?
- At what point in the process are alternative modes of travel considered?

While a project may have several goals, certain goals take higher priority by default. For example, to achieve LOS C, all other priorities may become secondary to the flow of traffic as a result. If DOTs want to address community concerns, project goals should reflect the community's input and priorities, not a one-size-fits-all LOS goal. For example, if the community wants a safe, walkable corridor, the goals set for a project may not include decrease in delay for vehicles.

This is especially challenging when projects are developed to address lower LOS at peak periods. DOTs should reconsider designing improvements and investing limited resources to address the most congested 15 minutes of the AM and PM peaks.

In addition, especially with state-of-repair projects, project teams may not have information about what that community wants, what questions to ask to anticipate conflicts in needs, or how to resolve those conflicts. DOTs should have procedures in place to ensure that project teams collect this information consistently—otherwise LOS will continue to drive design decisions by default.

Relaxing expectations around LOS can remove one of the biggest barriers to making lower-cost investments while still addressing much of the identified need. USDOT has developed case studies outlining several alternative metrics to LOS to consider.¹

WSDOT: Accepting lower performance

The Washington State Department of Transportation, which has pioneered a statewide practical solutions approach, includes “accepting lower performance” as one of six strategies staff should consider to address performance gaps. As WSDOT notes, the benefits of addressing the performance gap do not always outweigh the cost of investing in a solution.

Give other measures greater weight

DOTs should supplement LOS by giving other measures, like accessibility and safety, the same weight to address the state's priorities more accurately. Work and non-work accessibility measures better capture the goal of getting people and goods where they need to go in a reasonable amount of time. The measures used in project development should also reflect the community's input and priorities, not a one-size-fits-all LOS goal.

For many of the same reasons mentioned above, giving LOS less weight in relation to other goals can lead to more successful, cost-effective projects. Additionally, there is a steep increase of marginal costs for improvements made to keep LOS above “F” at all times. This is especially problematic when achieving a certain level-of-service stands in direct conflict with other goals for the project, such as pedestrian safety.

WSDOT: Emphasizing other performance measures

WSDOT is currently working to change which performance measures it uses in day-to-day decisions to place greater emphasis on the broader outcomes the state has identified that

¹ U.S. Department of Transportation. Level of Service Case Studies. December 2017.
<https://www.transportation.gov/office-policy/transportation-policy/level-service-case-studies>

its transportation network should help advance. These performance measures will feed into a new Practical Solutions Performance Framework WSDOT is developing to bring the state's six transportation policy goals (mobility, environment, economic vitality, preservation, safety, and stewardship) directly into its decision making at every level, from statewide planning down to roadway design. The new framework will help WSDOT make a more intentional determination about which transportation problems are most critical and which potential investments will move the state toward its vision for the future, rather than defaulting to traditional measures focused on vehicle throughput.

Consider replacing LOS in development review with alternative measures like vehicle miles traveled

Focusing on preserving LOS can lead to roadway expansions that induce more vehicle trips, ultimately degrading LOS again. This is an expensive cycle. DOTs should consider replacing the use of LOS in land development approval with a measure like vehicle miles traveled (VMT). There is precedent for this already in California, discussed below. A more productive approach seeks to minimize traffic from development before resorting to just building expensive, bigger and wider roads. This approach is discussed in greater detail in the Practical Solutions Memo in this series titled "How to address land use and context."

A new report, *Modernizing Mitigation*, from the State Smart Transportation Initiative provides more information about how to implement VMT measures for decision-making in place of LOS, as well as examples of how this new practice is working in California regions.² USDOT also provides an analysis of LOS alternatives used by both state and local agencies.³

California: Measuring VMT

Many states such as California have accepted that the LOS in highly urbanized areas will be "F" for single-occupancy vehicle movement during the peak hour(s). In other words, they have decided on a number of hours during peak period for which LOS F is acceptable, based on technical, political, and financial constraints. In states where LOS F during peak hours is assumed, the conversation shifts to predictability of traffic flow performance metrics and capacity within alternate corridors and transit.

As a result of California state legislation (SB 743),⁴ the DOT and localities are shifting to using vehicle miles traveled instead of LOS in development review and approval.⁵ This change is the result of recognition that using LOS measures to assess the need for additional roadway capacity during development review increases the cost of infill

² State Smart Transportation Initiative. *Modernizing Mitigation: A Demand-Centered Approach*. September 2018. <https://smartgrowthamerica.org/resources/modernizing-mitigation-a-demand-centered-approach/>

³ U.S. Department of Transportation. *Level of Service Case Studies*. December 2017. <https://www.transportation.gov/office-policy/transportation-policy/level-service-case-studies>

⁴ State of California. Senate Bill No. 743. Retrieved December 2018. http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB743.

⁵ State Smart Transportation Initiative. *California moves to reform traffic mitigation process*. November 2014. <https://www.ssti.us/2014/11/pasadena-development-review-moves-away-from-auto-delay-and-toward-auto-miles-traveled/>

development and incentivizes suburban sprawl. The state will better achieve its Greenhouse Gas emission reduction goals and improve the affordability of its communities by using performance measures that incentivize alternative modes of transport and density and mix of land uses.

The Governors' Institute on Community Design worked throughout 2017-2018 helping a small group of state departments of transportation question and assess the underlying assumptions that result in giant highway solutions for every transportation problem. This memo is part of a series about the states that are finding success through what's known as practical solutions, a way for transportation departments to meet changing demands and plan, design, construct, operate, and maintain context-sensitive transportation networks that work for all modes of travel.

The Governors' Institute on Community Design, a program of Smart Growth America, helps state leaders address economic development, housing, transportation, and other pressing issues that relate to how communities grow and develop.

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