

This Week's Survey Results (Survey 2)

Multimodal Level of Service

Earlier this month, *The Urban Transportation Monitor* sent via e-mail survey questionnaires on Multimodal Level of Service to 400 city and county traffic engineers. Responses were received from 44 cities and counties. This represents a return rate of 11%.

The results of the survey are published here.

How satisfied are you with the Highway Capacity Manual (HCM) LOS methodology, providing six levels of quality of service based on capacity?

	Percentage of Respondents
very satisfied	5%
satisfied	30%
neutral	30%
unsatisfied	35%
very unsatisfied	0%

What are the main reasons for your answer to the previous question?

- It is the national standard and Florida has been and will continue to be a major contributor.
- Current delay thresholds somewhat reflect driver perceptions. LOS stated here is motor vehicle delay, not quality of service. Quality of service involves more than motor vehicle delay.
- Doesn't encompass all travel modes and reflect varying tolerances to delay depending on location.
- It goes into a great level of detail and it penalizes high capacity bike and walk areas for being too successful. A full sidewalk should not have a direct relationship to a lower LOS.
- I was glad to see the multi-modal LOS features in the new manual but was disappointed after testing the tool. Parameters that we reasonably expected to "move the dial" did not significantly change the LOS. There seems to be a sensitivity issue with the new procedures. For example, we analyzed a segment with and without a physically buffered bikeway and the results were unrealistically close.
- Too auto focused. Not convinced that capacity is best indicator of service.
- More levels will be more difficult to explain the difference.
- The bar for assigning A, B etc. is set too low. Politically it is difficult to defend a standard of LOS A or B for bikes or pedestrians when we are experiencing LOS F for vehicles, yet bike/ped LOS A and B are not that great. Very data intensive, does not lend itself to system planning nor to development review, and difficult for advocates to apply the methodology.
- It's too complicated.
- The Level of Service concept of A to F is not matching the public's reality. No one wants their student to get a D, but that's really not bad in our urban settings.
- HCM is clear and easy to follow. Additionally, several software programs are based on the HCM methodology to make it easier to do the calculations.
- Scoring on a point system seems too subjective. The research findings were based on limited funding and are bound to be overturned in the future.
- Auto LOS is widely recognized as a poor performance measure to use for design transportation systems in urban areas as it ignores other important goals, including multimodal access, safety, and land use goals.
- Only accounts for vehicles.
- The public has a hard time understanding how a D is considered acceptable.
- First of all, it has been used for a long time. Second, it is not just based on capacity, but also other criteria pertaining to each specific type of facility and modes of transportation. I have seen different, more complicated definitions of LOS, such as A-G, being used in other publications, but just a different way of characterizing the LOS. A-F grade is acceptable and relates with humans' expectations reasonably well.

Multimodal Level of Service (Continued)

- I work for a State DOT. While they sometimes raise other concerns, besides capacity, the public we serve seem to be concerned primarily about capacity, meaning the ability to go where they want when they want with as little delay as possible.
- Level of Service is easily understood by non-professionals and the new multimodal LOS provides comparative performance measures using the same tool.
- It appears to be the best tool around. It is popular, the concepts are relatively easy to follow, and it does take account of driver behavior.
- The HCM methodology is not a bad method, but quality of service could be based on more factors than just capacity.
- Capacity (defined as roadway capacity for the purposes of the following comments) is only one of many considerations when assigning LOS to facilities. Capacity is applicable for vehicle flow but is not as applicable in determining bicycle, pedestrian and transit LOS for a chosen facility. Assigning LOS grades based primarily on capacity is misleading and almost useless for bicycle and pedestrian facilities in particular.

Should LOS be based on traveler perceptions?

	Percentage of Respondents
yes definitely	13%
yes	30%
neutral	39%
no	17%
definitely not	0%

What are the main reasons for your answer to the previous question?

- From a planning perspective, LOS is used to determine the number of lanes needed for future demand. The future is difficult to predict so perception would be difficult to measure. The perception seems to come into play more when doing operational types of analysis to understand or help predict traveler behavior as part of active traffic management strategies.
- There may be some value in LOS delay thresholds being different in urban and rural areas. For instance, LOS D/E is 55 seconds of vehicle delay. Perhaps this could be increased for urban areas where drivers tolerate a higher level of congestion and costs to improve to LOS D are high, which may prevent agencies from doing any improvements at all.
- I would say yes - but this could be very hard to collect.
- Perception is important, but some empirical data should also play an important role.
- Only in terms of multi modal — where perception (of safety, especially) has a big impact. For instance, a wide, smooth bike lane may have more than enough capacity but if on a 60 mph road, it's actual utilization may never come close to its theoretical capacity.
- Traveler perceptions is not a very good indicator.
- Perception of safety and comfort is what leads people to walk or ride. In the US, crowding (v/c) is typically not an issue for bikes and pedestrians.
- I work with the public. I know perception is very different among people.
- There is good and bad with that. The problem with the LOS is that if your city's policy is to increase active transportation, then the performance measures are not aligned with what the perception is.
- Not just traveler perceptions, but also tangible field conditions.
- The term 'service' is typically defined as subjective to the person receiving the service. "
- Engineers prefer a numerical result and so does the public from engineers. Somehow, perception has to be determined numerically.
- My answer is ""maybe" because I do think that there should be some sort of standard and if it was based on travel perceptions, we wouldn't have any consistency nationwide since people in larger areas tend to have higher thresholds for congestion.
- End user perceptions should play a part.
- Such as pedestrian, bicyclists and transit, the LOS should be based on traveler perceptions. Even the current A-F LOS designation based on capacity also ties indirectly with travelers' perceptions as well, because it has to do with spatial density of the vehicles on roadways.
- In a perfect world, I would say ""yes, definitely." Realizing, however, that perceptions vary with the individual and can be difficult to assess, there may be practical limits to what we can do in this regard. We need to use quantitative, calculable measures.
- Performance is mostly a determination of traveler perception of acceptability.
- The LOS is a combination of driver perception and capacity i.e. physical space and time to process vehicles

Multimodal Level of Service (Continued)

What should LOS be based on?

- Volume to capacity.
- Delay of all modes, comfort (speed, variation in speed, lane changes, driveway/side street friction, etc.), appearance (vegetation, active frontages, human-scale references).
- Delay for motor vehicles is good. More quality-based for pedestrians and bicyclists.
- A simple set of measures that can be easily gathered. More detailed analysis can be left to engineering judgment. The LOS should be a screening process, not a full design.
- Physical conditions, including dimensions (road, lanes, sidewalks), volumes, width, parking availability, pavement condition, number of driveways, accident history, etc.
- Roadways need to consider intersection capacity and other facilities should account for perceptions, though quantified, that could increase or decrease capacity accordingly.
- Volume to capacity in addition to delay.
- Speed and volume of adjacent vehicle traffic; presence/volumes of buses and trucks; presence and type of buffer from adjacent traffic; width of b/p facility; pavement quality; presence of illumination; attractiveness of adjacent land uses; and presence of landscaping.
- I think we should keep the Automobile LOS. It will be affected by bicyclists and pedestrians. The city has adopted a complete streets approach to traffic impact analysis. I would like to see the automobile LOS only considered as an impact but make sure new developments are upgrading bicycle and pedestrian facilities to current standards.
- It should be a function of community values.
- Traveler perceptions, all users of the roadway: bikers, pedestrians, etc.
- The conditions used are fine, but the output should be based on a measure of effectiveness rather than a unitless point rating system
- All factors: vehicles, signal timing, pedestrians, bikers, etc.
- More than just peak 15 minutes.
- As it stands now, different criteria have been used in different facilities and modes of transportation. If you were to propose new criteria in addition to those, I will suggest the "safety" measure. That will also tie into the Highway Safety Manual.
- For about 30 years now we've been using some variant of delay as the measure for intersections and elements thereof. It seems like a good basis, if a cumbersome one to calculate. Computationally, capacity is easier, but I don't think it serves the public as well.
- Varies based on the mode of transportation. Motorized transportation - Delay, Transit - Delay, Crowding, Headway. Pedestrian and Bicycle - More Environmental/Comfort and Safety.
- The facility's performance.
- The LOS should be based on several factors, including capacity, traveler's perception, volume and various travel modes of users.

Which transportation modes do you believe the concept of LOS is applicable to?

	Percentage of Respondents
auto only	14%
all highway modes (auto, bicycle, pedestrian, transit, truck)	82%
other	4%

Does your agency believe that auto, bicycle, pedestrian, and transit LOS should all be evaluated on urban streets?

	Percentage of Respondents
yes definitely	35%
yes	30%
neutral	30%
no	5%
definitely not	0%

Multimodal Level of Service (Continued)

What are the main reasons for your answer to the previous question?

- Our agency has been on the forefront conducting research and implementing bike, pedestrian, and auto level of service.
- Policy says yes, still working on how to incorporate evaluation into analysis and design.
- Such policy decision has not been investigated and presented to decision makers.
- Still figuring this out.
- We wish to improve conditions for all users of the street system; working toward moving away from an auto-centric LOS-based impact analysis to a complete streets approach so that we can pursue multi-modal mitigations that can also demonstrate a quantifiable improvement over existing conditions.
- The City of Austin is committed to the complete streets approach to managing our rights of way. All modes need space, and streets should serve the community — not the other way around.
- To identify the improvements in modes.
- ODOT is interested but typically does not assign resources to evaluate bike/ped/transit LOS on urban arterials. The only policy standard in place is v/c - currently practitioners have no way to make tradeoffs between modes.
- We believe that a project’s impact on all modes of transportation should be considered when processing a new development.
- Yet, the new LOS does not reflect our needs.
- It will be hard to evaluate LOS for other than vehicles. Additionally, it will cost a lot and take more time. There should be other ways to evaluate the roadway LOS for other modes than the HCM methodology.
- Depends on the type of study. For routine, small projects, multimodal LOS would be overkill and yield little in terms of unusual findings.
- If LOS is used as a performance measure, it should cover all users. However, this still leaves important goals, such as safety and land use, unaccounted for.
- The last five years or so, the public has become smarter in their understanding of what the LOS does not include. This city also has heavy bicycle traffic.
- All are viable transportation modes. Frequently improving corridors to accommodate acceptable LOS for cars means providing no accommodations for other users (LOS F for ped, bike and transit).
- On the rural area as well.
- There are probably only one or two dozen people in my agency more than vaguely aware that LOS can be calculated for other modes. Our governor has mandated a “complete streets” policy, but we are still working through what that means.
- Why should LOS not apply to urban streets?
- The discussion in the office is going in that direction, but many are skeptical. The level of congestion, vehicular and pedestrian, in NYC poses challenges to the HCS in simulating New York conditions. Thus, adding more modes to the same shared network is simply problematic.
- I think that the character of the street should determine what level of services should be evaluated.
- A multimodal transportation district was established in central Tallahassee in 2009.

How should the LOS be reported for the different modes using an urban street?

	Percentage of Respondents
report the LOS for each mode separately	50%
report one overall LOS for the street	23%
other	27%

How should each mode be treated independently (current HCM approach) or is it better to use each simultaneous, interactive multimodal LOS approach?

	Percentage of Respondents
mode should be treated independently	44%
a simultaneous, interactive multimodal approach?	33%
other	23%

Multimodal Level of Service (Continued)

What are the main reasons for your answer to the previous question?

- If there are no bike or pedestrian facilities on the network, it may not make sense to do an interactive approach, for example along an interstate or other facilities connecting regions where the context is to move people and freight only. Should there be a consideration for LOS of rail, aviation, and truck? There seem to be two types of multimodal (1) the urban street concept where bike, ped, auto and transit are all working to move people and (2) inter-regional concept where rail, aviation, truck, and auto are moving people and goods.
- More effort is needed to design all streets with a simultaneous, interactive multimodal design approach, but in all cases the LOS for one mode will have a higher priority than others, so overall street LOS should reflect individual LOS for each mode as well as composite.
- Knowing the modal components of an overall multimodal score may allow some adjusting to take place. If a multimodal standard is used, it would be beneficial to know how each mode contributes to this score when tradeoffs have to be made to adjust the overall score.
- This question needs a lot of thought. I don't think the industry is ready to answer this question. ODOT is looking at Traffic Level of Stress as a good screening indicator, along with the Travel Cost Index (TCI), to simultaneously measure accessibility across all modes.
- Four separate calculations adds to the cost and data collection of analyses is one key reason; difficult to collect all the data required for the current HCM method.
- Each mode is important and no one mode should dominate a street's score.
- To identify the improvements needed in each mode.
- Method should allow trade-offs and comparison of alternatives but not report as single LOS. MMLoS should be a tool - decision-makers (not just engineers) still have to make the tough decisions.
- I think the most important LOS is for the auto, but I think the LOS should be considered for other modes of transportation also.
- There are many different situations that are important here.
- It is better to evaluate the overall LOS for roadways and recommend improvements that will improve the overall system rather than focusing in evaluating one mode and come up with improvements to that mode which for sure will affect other modes. For example, better vehicle LOS mean higher speeds and would impact pedestrian and bike activities.
- Each mode has a different perspective. Combining mode LOS would dilute the amount of information that is available.
- Theoretically, the current HCM does use simultaneous calculations, in that changes to auto design affect ped LOS. However, refinement of the models is likely needed to get these relationships right.
- Each of the modes can be treated separately, but possibly the engineer/planner should have the means to determine for the locale the percentage of impact of each individual mode to the total result.
- One simultaneous LOS for all modes of transportation might be interesting and useful. I need to see it before convincing myself that it is definitely useful. On the downside, the unified multimodal LOS index will require much more data to derive the level of service.
- On every road and street I work with, the auto LOS would or should dominate the calculation, but we value non-auto travelers as well. Having a composite measure could allow us to better observe how changes in volume or capacity for one mode would affect the LOS of the others.
- An independent analysis helps isolate the mode performance, although an interactive multimodal LOS could be beneficial in measuring the interaction of modes.
- When one mode is as dominant as is the case auto or pedestrian, then the very minor modes can easily be skewed in relation to the dominant modes.
- A multimodal approach would certainly be more advantageous in balancing the needs of all transportation modes
- Every place is unique and a single approach will not work for every community. Flexibility is preferred.

Do you believe your agency's engineering department would be supportive of a multimodal LOS approach or would it be more supportive of a traditional auto only approach?

	Percentage of Respondents
multimodal approach	6%
auto only approach	83%
other	11%

Multimodal Level of Service (Continued)

If a professionally acceptable multimodal LOS approach(es) was available do you believe your agency would attempt to use it?

	Percentage of Respondents
yes	96%
no	4%

Would it be desirable for each mode to have independent nationally recognized approach (e.g., Transit Capacity and Quality of Service Manual) or would it be desirable to have the modal approaches contained in one nationally recognized document (e.g., HCM, AASHTO's "Green Book" [Geometric Design of Urban Streets and Highways])?

	Percentage of Respondents
one document for all modes	74%
independent documents for each mode	0%
other	26%

Any other comments?

- New data sources are coming online so fast. I think we need to move more to engineering judgment and farther away from cookbook manuals - they are out of date by the time they come online.
- One publication is enough. Too many documents cost too much.
- I would prefer a national approach, or at least by region, as it makes it easier for the city to determine a means for LOS which is the same for all studies.
- Good proposal. A paradigm-shift step.
- My comments above about what would be "desirable" notwithstanding, realizing that resources are finite, I would have difficulty advising my congressman to support capacity-related research on modes other than autos and transit. The bicycle and pedestrian modes need facilities, but in most of the country, they don't have enough volume for capacity to be an issue.
- It would normally be tested, and if proven to be effective, then it could be adopted.