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Approaching Industry Standard for Multimodal LOS?

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Mr. Christopher DeRosia P.E., PTOE 06-08-2021 05:24 PM
Hi Everyone: 3-4 years ago I heard a planner in Colorado discuss their dissatisfaction with the curr...

1. Approaching Industry Standard for Multimodal LOS?

0 Recommend



PTOE
Mr. Christopher DeRosia P.E., PTOE

Actions

Posted 06-08-2021 05:24 PM

Reply

@ITEPortland2023 Call for Abstracts

Hi Everyone:

3-4 years ago I heard a planner in Colorado discuss their dissatisfaction with the current methods for determining multimodal LOS. I believe they were referring to the brand new at the time HCM methods? This planner suggested other methods were being developed locally though I was never able to follow-up and see anything concrete. It has been a little while since I have worked on a multimodal project and I'd like to learn of where we stand.

Could any engineers (or technical minded planners) who have more recent qualifications engineering and designing ped/bike facilities informed by multimodal LOS analysis results please share any guidance? I have one agency client inquiring about this and I am also looking to upskill in this area before my next multimodal project.

Thanks!

Christopher DeRosia P.E., PTOE
Transportation Engineer
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chrisderosia@gmail.com

2. RE: Approaching Industry Standard for Multimodal LOS?

0 Recommend



Bill Schultheiss P.E.

Actions

Posted 06-08-2021 07:06 PM
Edited by Bill Schultheiss P.E. 06-08-2021 07:00 PM

Reply

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The problem with the Multimodal LOS in the HCM is it compares apples (traffic delay) to oranges (pedestrian and bicyclist comfort). It doesn't make any actual sense, but sounds amazing in the context of talking to traffic engineers. As long as you realize it is comparing these differences - you can be clear that you are using this tool as an assessment of tradeoffs between comfort of the vulnerable users versus the delay of motorists (and transit users). The other shortcoming is that the LOS model for bicyclists is dated. It was developed in the early 2000s and does not allow an assessment or consideration of protected bike lanes or shared use paths - two bikeway types which are essential for improving bicycling conditions and mode share. So when your overall LOS score is reporting, A - F using these models, just beware of these limitations.

Bill Schultheiss, P.E.
Director of Design and Engineering

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3. RE: Approaching Industry Standard for Multimodal LOS?

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PTOE
Mr. Christopher DeRosia P.E., PTOE

Actions

Posted 06-09-2021 02:59 PM

Reply

@ITEPortland2023 Call for Abstracts

Thanks Bill! I agree, in feeling the environment in modern day creates pressure that often results in oversimplification in practice. We can't lose sight of the need to be scientific in our approaches to adequately substantiate our recommendations. I'm not sure how much we'll dig into this for then though I will do my best to post again later to share what we develop.

Christopher DeRosia P.E., PTOE
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Original Message

4. RE: Approaching Industry Standard for Multimodal LOS?

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Posted 06-09-2021 12:54 PM

Reply

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Christopher,
I agree with Bill's comments regarding HCM Multimodal LOS, but I'll take it a step further. LOS metrics cannot be the same for modes that are distinctly different. The other major

Mr. Christopher
Comeau FAICP-
CTP

Actions

problem is that coarse LOS metrics in a national manual cannot incorporate the finer-scale details of local land use context, character, goals, policies, and strategies based on community preference. There is no universal metric and if there were, it would result in Anywhere, USA. Each community needs to 1.) Determine what they want (goals/policies/outcomes) and 2.) Create metrics that help to achieve that. It's that simple. A long time ago, a wise colleague of mine explained "You will get what you measure." In Bellingham, Washington we developed an innovative [Multimodal Transportation Concurrency Program](#) in 2007-2008 with metrics for vehicles, transit, pedestrian, bicycle, and multiuse trails that are registered with various land use contexts throughout the city. We track our progress and publish a [Transportation Report on Annual Mobility \(TRAM\)](#) each year. This allows us to adjust our strategic planning to implement the goals, policies, and strategies in the local Comprehensive Plan.

I'd be happy to discuss this with you further.

Chris Comeau, AICP-CTP, Transportation Planner

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NOTE: All email subject to public disclosure requirements per RCW 42.56

Original Message

5. RE: Approaching Industry Standard for Multimodal LOS?

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Dr. Peter Furth

Actions

Posted 06-09-2021 01:41 PM

Reply

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When the service that a road section or intersection provides to users can be reduced to single dimension, then a single measure for Level of Service is OK. That's how it is for cars: LOS is all about delay / travel time / speed, because other aspects, such as safety, are so good that they are a non-issue. But for bikes and peds, the idea of using a single measure for Level of Service is so wrong. I know it's appealing in its simplicity; but it's just wrong.

In the 2000 HCM, there were 3 measures of LOS for peds: One for delay, one for how crowded the crosswalk is, and one for how crowded the queuing area is. The 2010 and 2016 HCM collapse these, with other things, into a single "Multimodal Level of Service." Delay might be terrible, but if you have few pedestrians, you'll have very uncrowded condition in your crosswalk and your queuing area, and so when you combine them, your LOS doesn't look bad. That's just wrong. It's better to calculate LOS for peds the old way. Always calculate and report LOS with respect to delay; use the 2000 HCM for criteria - more than 60 s is LOS F. If crowding might be an issue, then calculate LOS for crowding, but we know that crowding is an issue only in a few places.

Overall, the replacement of the 2000 LOS measures with MMLOS has resulted in less respect for pedestrian delay. We need to elevate pedestrian delay to being treated as seriously as auto delay, and the only way to do that is to report a simple delay-based LOS for pedestrians at intersections.

As Bill points out, the service that cyclists and peds get is also a function of safety, which the multimodal LOS measures don't do a good job with. For bikes, on segments, don't use any HCM method; use Level of Traffic Stress instead. For intersections, there are several methods proposed and in development that try to account for things like turn conflicts, which are very important.

Safety, delay, and crowding are all important. We should resist the allure of collapsing them into a single metric; it only serves to dampen the message, allowing unacceptable levels of delay / safety / crowding to "hide" behind acceptable measure on other dimensions.

Peter Furth
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Original Message

6. RE: Approaching Industry Standard for Multimodal LOS?

0 Recommend



Mr. Christopher
DeRosia P.E.,
PTOE

Actions

Posted 06-09-2021 03:06 PM

Reply

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Dr. Furth:

This is helpful and I will certainly keep in mind the limitations you all highlighted as I begin review of HCM methods, NACTO, and local guides. I try to post back later to share my thoughts especially if this turns into more of a project effort.

Thanks!

Christopher DeRosia P.E., PTOE
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Original Message

7. RE: Approaching Industry Standard for Multimodal LOS?

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Mr. Ian Hlavacek
PE

Actions

Posted 07-22-2022 06:23 PM

Edited by Mr. Ian Hlavacek PE 07-22-2022 06:25 PM

Reply

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Dr. Furth -- We've been investigating Multimodal LOS here in Houston recently. We've made an earnest, good-faith effort to employ the HCM MMLOS methodology, but I agree with you: for several reasons, it doesn't appear to be very useful as it is currently defined. For one thing, I have been unable to identify even a single one of our Texas-sized intersections that result in a Pedestrian LOS lower than LOS C!

However, I'm concerned the HCM 2000 delay methodology for pedestrians at signals is too

simple. It only looks at the delay while a pedestrian waits at a corner for a walk signal; it does not capture the safety concerns related to crossing a wide, fast street. I think more people avoid walking because they have to cross massive intersections instead of concerns about delays while they wait on the corner.

In fact, I worry the a simple delay calculation could result in decisions that actually decrease walking safety and comfort. It's not hard to imagine a situation where a roadway widening project could result in a larger proportion of walk time to the signal cycle length and thus decreased pedestrian delay. However, it seems self evident that roadway widening will always directly, negatively impact the pedestrian experience. That doesn't mean we should never do it -- however, we should quantify that impact.

We in Houston are eagerly awaiting any updates on the methodology that TRB may provide in the future!

Ian Hlavacek, PE (he/him/his)
Managing Engineer, Houston Public Works
Multimodal Safety & Design Branch
832.995.3002

[Original Message](#)

8. RE: Approaching Industry Standard for Multimodal LOS?

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Mr. Michael Flynn
AICP

Actions

Posted 07-25-2022 12:35 AM

Reply

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I completely agree, Ian. In fact (and this is relevant to a discussion on the All Member Forum related to "engineering justifications"), many engineering standards can result in the opposite of the intended outcomes for the subject mode, or at least have unintended outcomes on modes other than the subject mode. That is the issue with making technical decisions divorced from policy and planning goals, or making decisions based on only one factor rather than the full range of relevant factors. In this example, we're looking at only today's pedestrian demand (which may be depressed because of on-the-street conditions) rather than flopping the question to what changes would support the desired policy/community goals? And in this example, we're also only looking at one factor (delay) rather than including others (actual and perceived safety, latent demand, public health goals, climate action goals, fairness goals, economic development/quality-of-life goals, etc.).

Mike

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9. RE: Approaching Industry Standard for Multimodal LOS?

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Dr. Fabio Sasahara PhD,
PMP

Actions

Posted 07-25-2022 08:36 AM

Reply

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Ian, these are great points. The Highway Capacity Manual recognizes that delay may be too simplistic to evaluate pedestrians' experience, and the recently published HCM 7th Edition addresses some of these issues.

For example, the new methodology for Pedestrian LOS for TWSC intersections was revamped and now implements a new service measure called "Proportion of dissatisfied pedestrians". This measure still takes delay into consideration but also includes several new factors related to pedestrian safety and comfort, such as the presence of crosswalks, median refuges, and the probability that a driver will yield to a pedestrian crossing.

More details of this method can be found at NCHRP Research Report 992:
<https://www.trb.org/main/blurb/182687.aspx>

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[Original Message](#)

10. RE: Approaching Industry Standard for Multimodal LOS?

0 Recommend



Mr. Christopher DeRosia P.E.,
PTOE

Actions

Posted 06-09-2021 03:01 PM

Reply

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Chris:

I may take you up on the phone call though let me do some work on my end first looking at some of these references you all shared and the data this agency has.

Thanks!

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[Original Message](#)

11. RE: Approaching Industry Standard for Multimodal LOS?

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Posted 07-25-2022 08:58 AM

Reply

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In light of the excellent advice from the experts in this chain, you might also consider the



Mr. Duncan Allen
PE

Actions ▾

...high on the spectrum... evolution of what is in my opinion the second most mature and developed 'LOS' schema in the business, the Transit Capacity and Quality of Service Manual (TCQSM). By its second edition, it had done a good job structuring an array of attributes (travel time, comfort/crowdedness, reliability, etc) important to travelers' perception of quality of service. The LOS ratings were patterned on the HCM A-F letter schema. Our firm has processed huge amounts of APC data from various transit systems and information from overseas to make the assessments both of travel time and travel time reliability more universal and quantitative. Interestingly, in its third (2013) edition, the TCQSM has steered away from using the letter grades, citing among things a need to reflect a management POV distinct from that of passengers.

As prior commenters have suggested, individual components of the MMLOS may not be so highly developed as topics in the HCM or even TCQSM ed 2. Attention seems to have been concentrated on achieving a broad spread of multimodal functionality using whatever the 'frontier' was at the time. Considerable work remains to be done IMO regarding both the relationships to traveler satisfaction with various attributes of the 'other' modes and with combining ratings in a balanced way. There is ample room for empirical research to fill in the gaps which remain between the present state and anything one might consider an 'industry standard'.

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