



Multimodal Level of Service Study

Transit Committee

January 9, 2014



What?

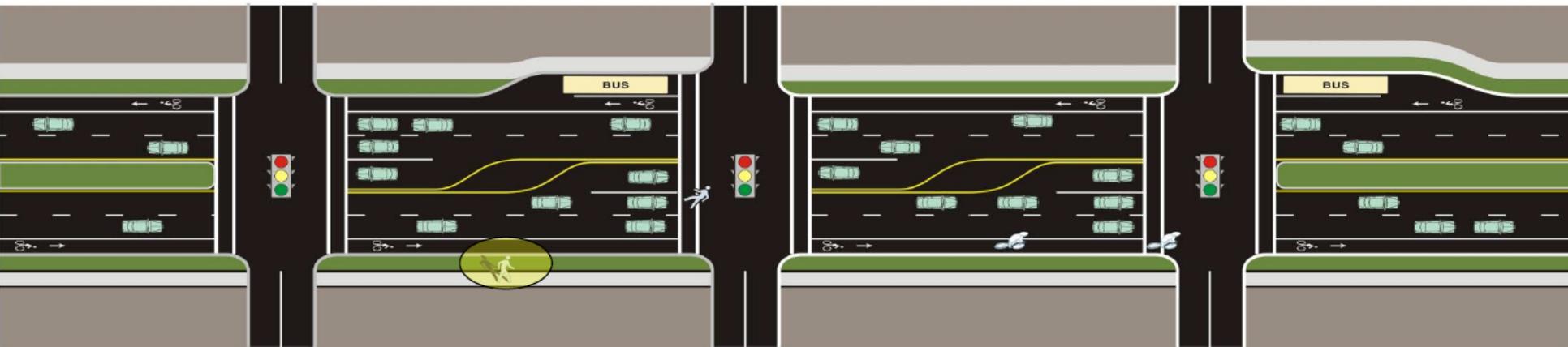
a method for assessing how well an urban street ***serves the needs of all of its users***: auto drivers, transit passengers, bicycle riders, and pedestrians...



HOW?

- The LOS models are ideal for evaluating the benefits of “complete streets” and “context sensitive” design options because the models ***quantify the interactions*** of the modes sharing the same street right-of-way.

Pedestrian LOS: Urban Street Segments



Factors include:

- *Outside travel lane width (+)*
- *Bicycle lane/shoulder width (+)*
- *Buffer presence (e.g., on-street parking, street trees) (+)*
- *Sidewalk presence and width (+)*
- *Volume and speed of motor vehicle traffic in outside lane (-)*

- Pedestrian density considered separately
 - Worse of density LOS/segment LOS used to determine LOS

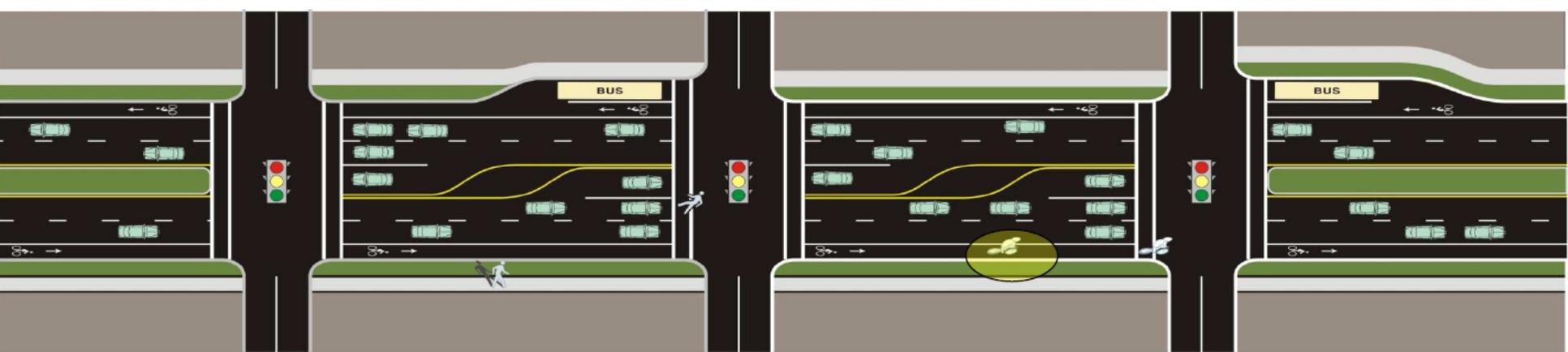
Pedestrian LOS: Signalized Intersections



Factors include:

- *Permitted left turn and right-turn-on-red volumes (-)*
- *Cross-street motor vehicle volumes and speeds (-)*
- *Crossing length (-)*
- *Average pedestrian delay (-)*
- *Right-turn channelizing island presence (+)*

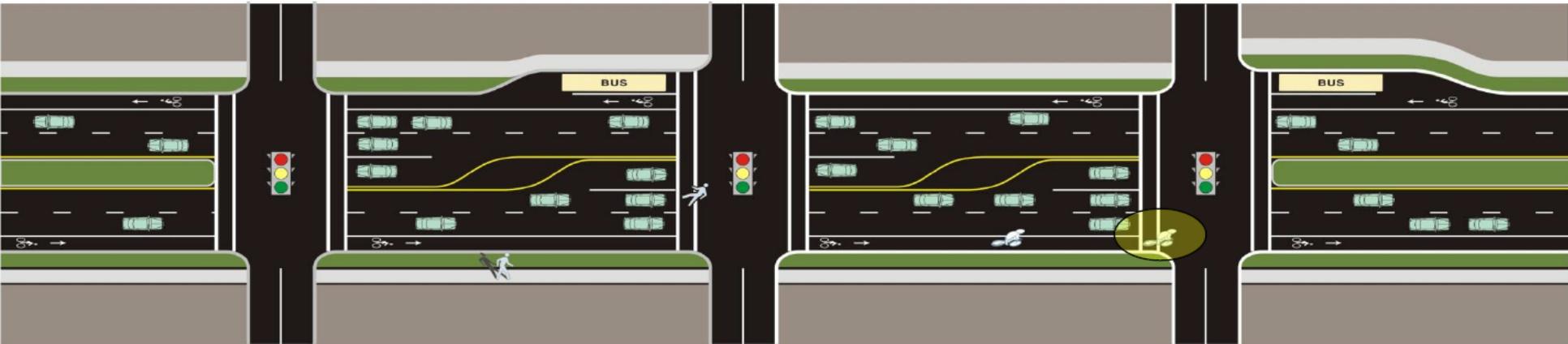
Bicycle LOS: Urban Street Segments



Factors include:

- *Volume and speed of traffic in outside travel lane (-)*
- *Heavy vehicle percentage (-)*
- *Pavement condition (+)*
- *Bicycle lane presence (+)*
- *Bicycle lane, shoulder, and outside lane widths (+)*
- *Number of driveways (-)*
- *On-street parking presence and utilization (+/-)*

Bicycle LOS: Signalized Intersections



› Factors included:

- *Width of outside through lane and bicycle lane (+)*
- *Cross-street width (-)*
- *Motor vehicle traffic volume in the outside lane (-)*

Approach

- › Develop a model that relates LOS to factors that:
 - *Have been shown to be important to customer satisfaction*
 - *Can be readily quantified*
 - *Can be related to ridership, or changes in ridership*
- › The more satisfying the service, the more likely people are to use it
 - *Based on on-board survey results showing important factors*

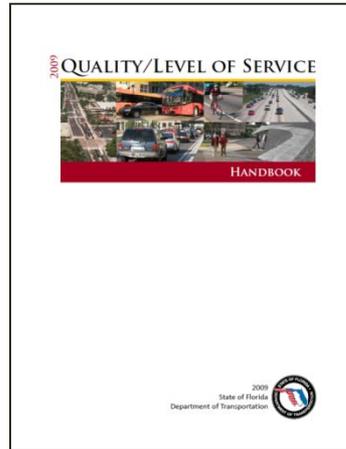
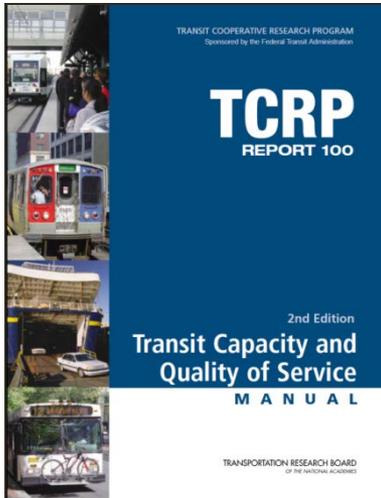
Rank	<u>Summary of On-Board Survey Factors</u>				
	Virginia 2B	Virginia 38B	Portland 14	Portland 44	Florida 18
1	Frequency	Frequency	Frequency	Frequency	Frequency
2	Wait time	Reliability	Close to home	Reliability	Wait time
3	Reliability	Wait time	Reliability	Close to home	Close to home
4	Close to home	Close to dest.	Wait time	Close to dest.	Reliability
5	Service span	Close to home	Close to dest.	Wait time	Service span
6	Close to dest.	Service span		Service span	
7	Friendly drivers				

Model Inputs

- › Only includes factors inside the right-of-way and which can be affected by agency actions
 - *Frequency*
 - *Speed (travel time rate)*
 - *Reliability & stop amenities (excess wait time)*
 - *Crowding (perceived travel time rate adjustment)*
 - *Pedestrian LOS*

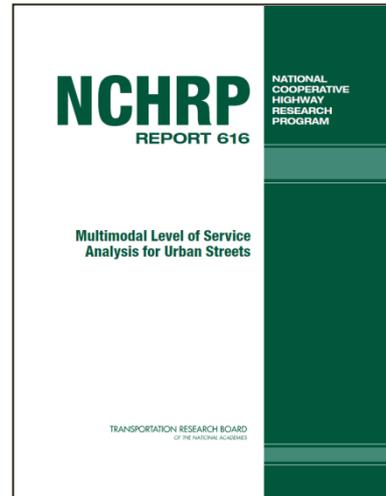
State of the Practice

- *Transit Capacity and Quality of Service Manual*

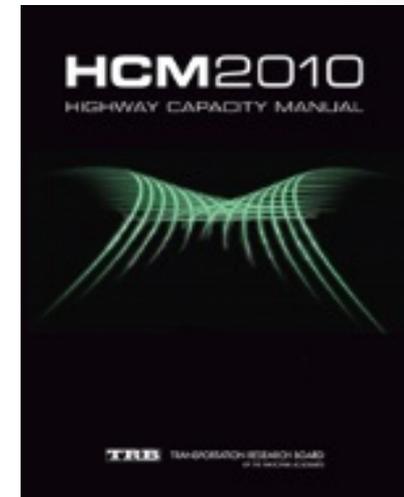


- *Florida's Quality/Level of Service Handbook*

- *Multimodal Level of Service Analysis for Urban Streets*



- *Highway Capacity Manual 2010*



Sample Applications

- ***Development Review:*** Multi-modal LOS analysis is required for improvements to arterial roads and for all public and private development in Fort Collins. The City may require private developments to provide off-site improvements if their sites do not meet minimum standards for pedestrian and bicycle LOS. (Fort Collins)
- Integration into ***Urban Design Street Guidelines*** (City of Charlotte)

Examples



Source: Jacksonville 2030 Mobility Plan

Source: Fehr and Peers

Sample Applications

- SFPDPH used the PEQI to perform *health impact assessments* in San Francisco's Eastern Neighborhoods and Mid Market areas.



Goals of the Study

- Develop evaluation tool that can be made available to member agencies
- Create MMLOS for Pilot Area to be utilized as an example project
- Educate member agency staff who are interested learning and utilizing the concept and tool

Input Requested

- Is the MMLoS tool of interest to your agency?
- Would your agency be interested in being a candidate for the pilot location?
- Any concerns / inputs regarding the goals of the study?

Questions?

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