

# Operations Performance Measures – National Efforts

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# Agenda

- Two national efforts
  - NTOC Performance Measures Task Force
  - NCHRP 3-68 – “Guide to Effective Freeway Performance Measurement”
- FHWA use of national performance measures
- Focusing on the outcome measures you are considering:
  - Travel Time Reliability and Congestion
  - Incident Duration
  - Customer Satisfaction

# NTOC Performance Measures

- National Transportation Operations Coalition (NTOC)
  - ITE, AASHTO, TRB, ITS America, ICMA, AMPO, plus other associations and the FHWA
- One of several task forces is focusing on operations performance measurement
  - Led by ICMA with assistance from University of Maryland Center for Advanced Transportation

# NTOC PM Effort

- Literature Review
- Initial List of 14 Candidate Measures
- Development of Survey
  - Sent to association members
  - 333 responses (261 from State and local agencies)
- Candidate measures and survey results reviewed by oversight committee at the ITE Technical Conference in March
- “Final” list of 10 performance measures has been developed – four defined here

# Some NTOC PM Definitions

- Travel Time Reliability (Buffer Index) - The buffer index is the additional time that must be added to a trip, to ensure that travelers making the trip will arrive at their destination at, or before, the intended time, 95% of the time.
- Extent of Congestion – Spatial (also measurable by time) - Miles of roadway within a predefined area and time period, for which average travel times are 30% longer than unconstrained travel times.

# Some NTOC PM Definitions

- Incident Duration - The time elapsed from the notification of an incident until all evidence of the incident has been removed from the incident scene.

# Some NTOC PM Definitions

- Customer Satisfaction – A qualitative measure of customers' opinions related to the roadway management and operations services provided in a specified region.
  - At this point, a “baseline” list of potential questions regarding management and operations has been developed that can be added to local or statewide surveys – more work to be done

# 10 NTOC Performance Measures

- Customer Satisfaction
- Extent of Congestion – Spatial and Temporal
- Incident Duration
- Recurring Delay
- Speed
- Throughput – Person
- Throughput – Vehicle
- Travel Time – Link
- Travel Time Reliability (Buffer Index)
- Travel Time - Trip



# NTOC PM Next Steps

- A report documenting these initial measures will be distributed to the operations community during the summer to encourage their use
- Potential next steps still under consideration - may include having states/locals actually “test drive” the performance measures to determine their usefulness and whether or not the data is available to reliably compute the measures

# NCHRP 3-68

- **National Cooperative Highway Research Program (NCHRP) project 3-68 “Guide to Effective Freeway Performance Measurement”**
  - **Objective is to develop a guide on the effective use of freeway performance measures in operating the system and in meeting the information needs of a large spectrum of potential local, regional, and national users.**
- **Panel focusing on measures of congestion and reliability**
- **Estimated completion date: October 2005**

# NCHRP 3-68 – Basic Principles

1. Measures based on travel time
2. Multiple measures are good
3. Traditional HCM measures not primary measures
4. Use person-based measures when necessary
5. Use mobility (outcome) and efficiency (output) measures

# NCHRP 3-68 – Basic Principles

6. Include customer satisfaction
7. 3 dimensions of congestion: source, temporal aspects, spatial detail
8. Include reliability measures (may require continuous data)
9. Use graphics and methods to communicate with both technical and non-technical audiences

# NCHRP 3-68 – Types of Currently Used Measures

- Outcome measures
  - Derivations of travel time, speed, delay
  - LOS still used but not as much
  - Reliability measures in early stages
- Output measures
  - Incident management efficiency
  - Operation of field equipment

# Use of Performance Measures by FHWA

- Key Outcome Measures
  - Travel time index
  - Extent of congestion
  - Buffer index
- Uses
  - Tracking national trends
  - Educating state and local governments on use of performance measures

# Key FHWA Performance Measures Efforts

- Urban Congestion Reporting (monthly)
- Mobility monitoring (annually)

# Urban Congestion Reporting

- Currently uses “web-scraping” from about 10 traveler information web sites with available travel time information to develop a monthly report on the following measures:
  - Percent congested travel (time-based)
  - Travel Time Index
  - Buffer Index
- UCR monthly report shared with FHWA HQ staff and field offices and used to feed Leadership Dashboard
- Near future: integrating monthly traffic monitoring data from traffic management centers and other sources into UCR report



# Urban Congestion Reporting

- April 2005 UCR (reporting on March '05 data)

**Table 1. UCR National Composite Indicators Table**

	UCR NATIONAL COMPOSITE INDICATORS								
	Month vs. Last Month			Month vs. Last Year*			Quarter vs. Last Year**		
	FEB.	MAR.	Change	2004	2005	Change	2004	2005	Change
% Cong. Travel	40.5%	42.6%	↑ 2.1%	40.3%	39.4%	↓ 0.9%	38.0%	38.0%	0.0%
Travel Time Index	1.622	1.629	↑ 0.007	1.616	1.612	↓ 0.004	1.621	1.637	↑ 0.016
Buffer Index	2.119	2.079	↓ 0.040	2.068	2.038	↓ 0.030	2.108	2.134	↑ 0.026

\* excludes Los Angeles and Louisville among eleven cities

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# FHWA Leadership Dashboard

- Presents information on “Congested Travel”
- Dashboard Includes:
  - National Congestion Indicators summary table and brief analysis from UCR reports (5<sup>th</sup> working day of each month)
  - FHWA Supplemental Indicators - goals and objectives and their related activities and status
    - 511 Deployment
    - Regional ITS Architecture Deployment
    - Reduce Work Zone Delay (self assessment scores and activities)
    - Reduce Traffic Incident Delay (self assessment scores and activities)
    - Congestion Partnerships (self assessment scores and activities)
- Provided for monthly FHWA Leadership meetings

Status: **Green** Progress: **Green**

# FHWA Leadership Dashboard

NATIONAL CONGESTION INDICATORS									
	Hours of Congested Travel Per Day			Travel Time Index			Buffer Index		
Current Quarter	5.47			1.606			2.044		
Same Quarter, Previous Year	5.69			1.611			2.072		
Change, vs. Previous Year	3.8%			0.3%			1.4%		
NATIONAL CONGESTION PATTERN	# of Cities DOWN >5%	# of Cities, NO CHANGE	# of Cities UP > 5%	# of Cities DOWN >5%	# of Cities, NO CHANGE	# of Cities UP > 5%	# of Cities DOWN >5%	# of Cities, NO CHANGE	# of Cities UP > 5%
Total Cities:9	4	0	5	2	6	1	3	4	2

For the period February - April 2005, there were nine UCR cities (Atlanta, Boston, Chicago, Houston, Miami, Philadelphia, Pittsburgh, San Antonio, and Seattle) where a comparison could be made against the same period in 2004. All three national indicators show declines compared to the same period in 2003, the first time we have seen all three indicators decline together since July 2004. The general trend was lead by decreases in congestion in Atlanta, Boston, Miami, and San Antonio. The sharpest decline was observed in duration of congested travel (3.8%), where the declines in Atlanta, Boston, Miami and San Antonio were large enough to offset increases in the other five UCR cities. Travel time index and buffer index show less significant decreases, 0.3% and 1.4%, respectively. Atlanta and Miami posted significant (greater than 5%) decreases in travel time index while Atlanta, Miami, and Philadelphia posted decreases of more than 5% in buffer index.

SUPPLEMENTAL INDICATORS			
Program Area	Current	FY05 Goal	Status
<b>511 Deployment</b> (% of National Population)	28%	40%	<b>Green</b>
<b>ITS Architecture Deployment</b> (Number of ITS Architectures)	211	270	<b>Yellow</b>
<b>Reduce Work Zone Delay</b> (Self Assessment Score 0-15)	7.9	8.3	<b>Green</b>
<b>Reduce Traffic Incident Delay</b> (Self Assessment Score 0-100)	45.4	50	<b>Green</b>
<b>Congestion Partnerships</b> (Assessment Score 0-5)	2.0	2.2	<b>Green</b>

# Mobility Monitoring Program

- Use of archived Traffic Management Center/ITS Data to develop annual performance measures
- Using 33 cities for 2004 data analysis
- Mobility Measures: Travel Time Index, Percent of Congested Travel
- Reliability Measures: Buffer Time Index, Planning Time Index

# Other FHWA Performance Measures Efforts

- Freight delay measures
- Incident delay measures
- Measures in early stages
  - Work zone measures
  - Weather measures

# Contact

- For more information on FHWA's work on Operations Performance Measures, contact Rich Taylor at
  - Rich.Taylor@fhwa.dot.gov
  - 202-366-1327
- Office of Operations Web Site:
  - [http://www.ops.fhwa.dot.gov/perf\\_measurement/index.htm](http://www.ops.fhwa.dot.gov/perf_measurement/index.htm)