Association for Commuter Transportation
1341 G Street, NW, 10th Floor Washington, DC 20005
Tel: 202.719.5331 | www.actweb.org |

Association for Commuter Transportation Recommendations to USDOT on MAP-21 Performance Measures

1. Overview of Suggestions

Following are recommendations concerning measures and approaches to assess performance of the National Highway System (NHS), the Interstate system, and projects and programs funded under CMAQ. These recommendations are being submitted by the Association for Commuter Transportation, with input provided by other professionals in the TDM industry. In making these suggestions we are mindful of the need to balance the desire to craft performance measures that work toward reasonable goals for our nation-wide systems and accommodate regional differences with availability of data to make these measurements. We urge DOT to adopt measures that encompass all the performance objectives of the transportation system, even if the data for some measures are not perfectly and consistently available at the moment. As discussed later, we believe we can begin these measurements with data sources available today and phase in complete and standardized data collection and analysis as resources and time permit. In suggesting these measures, we have kept in mind the major preferences expressed in the National Online Dialogue "voting":

- Focus on movement of people not only vehicles;
- Account for travel distance;
- Include multiple modes of travel;
- Facilitate scalability for corridors and regions; and
- Allow flexibility to reflect different areas and changes over time.

NHS and Interstate Systems Measures

Include Peak-Period Person Throughput (PPPT) as a primary measure

As discussed in more detail in Section 2, person throughput in peak periods is a practical and meaningful measure that can easily be understood by everyone. All modes and organizations, including the private sector can contribute to its improvement. Performance on this measure can be enhanced with relatively low-cost operational and spot improvement activities that are not dependent on the sizeable funding outlays required for construction. In a time of fiscal austerity, it is one of few measures for which there is a reasonable hope of improvement. Lasting reductions of congestion are elusive because latent demand quickly overtakes new capacity, but even if congestion remains approximately the same or shows moderate increases, our transportation system and nation benefit from movement of more people able to go about their business. Performance measures should reflect and encourage that.

CMAQ Measures

As discussed in more detail in Section 3, organizations that receive CMAQ funding for TDM projects routinely assess travel and emission impacts of the projects by estimating the vehicle trips, VMT, and emissions reduced and reliable, data-based methodologies have been developed for this purpose. We support continued flexibility in the application of such measures. In particular we encourage maintaining the ability of CMAQ funded programs serving regions or areas, such as TDM programs, to report benefits to congestion mitigation and air quality in terms of vehicle trip reduction, vehicle miles travelled reduction, and emissions reduction. We further recommend that benefits for these programs should be assessed at the geographic scopes they target. Regionally-focused programs should be assessed regionally – the transportation network is an integrated system of inter-connected links, so a trip reduced on one facility can be expected to enhance the overall system performance. Assignment of program and project benefits to specific corridors should not be required unless the programs are targeted to particular corridors.

Flexibility in Application of Targets for Measures

When targets are set for the measures, we recommend accounting for regional or jurisdictional size and other characteristics to set general frameworks of expectations of performance. Distinctions might be considered such as: Large Urban; Large Suburban, Small Urban/Suburban, and Rural to recognize the vast differences in performance situations. However, comparison of different corridors or regions is difficult, even within such "peer groups", because a myriad of local characteristics and conditions can affect performance or person throughput. Ultimately, the best indicator of progress should be to compare the particular segment against itself in periodic measurement and evaluation.

2. NHS and Interstate Performance Measure Recommendations: Include **Peak-Period Person Throughput (PPPT)** as a performance measure

Definition and Rationale

Peak-Period Person Throughput (PPPT) refers to the number of people moving through a lane mile of an NHS facility or other corridor during the peak period. This takes into account Average Vehicle Occupancy of personal vehicles, as is commonly used in regional modeling, and can account for travel by public transit, walking, and cycling, thus acknowledging the system improvements generated by investment in non-SOV mode facilities and services. Data sources are discussed further below.

- PPPT is a measure of how efficiently corridors and regions are able to carry individuals during the heaviest use of the transportation system, regardless of the modes they use. It focuses attention on the fact that congestion delays people, and that measuring vehicles can only indirectly capture the human and social cost of lost time and money; vehicles do not lose time, people do.

- Additionally, by measuring performance during peak periods, PPPT focuses attention on the time period when the transportation system is most stressed. The public easily understands peak-period performance; it impacts so many travelers through the daily commute and improvements to system performance during peak periods are visible and appreciated.

- Peak periods are the easiest time at which a region can affect congestion through cost-effective transit and transportation demand management (TDM) solutions, because travel volumes make such measures more feasible. Travelers also are more inclined to shift modes for repeated trips like commuting, which make up a large share of peak-period trips. Furthermore, MPOs and state DOTs are accustomed to forecasting and studying home-based work trips.

- PPPT is a positive measure, which has the potential to show numerical gains for corridors when travelers eliminate or shift driving trips, actions that can occur through a range of possible actions. These travel actions can be generated from TDM programs that encourage use of non-driving modes such as carpool/vanpool, transit, bike and walk; that shift travel from peak to off-peak times or eliminate trips entirely (telework / compressed work schedules). These actions also can be realized through system-technology actions undertaken in Intelligent Transportation System (ITS) and Integrated Corridor Management (ICM), expansion of transit service, traffic operations enhancements, spot physical improvements, and incident management.

- On urban "Other NHS Routes" and "MAP-21 Principal Arterials," person measures can include bike and walk volumes. Including a measure of peak-period person throughput will reward projects, regions, and states that optimize the operation of the transportation system through relatively low-cost infrastructure improvements and programmatic support and will encourage local agencies to collect data on transit and non-motorized trips, broadening future opportunities to assess these growing segments of personal urban travel.

- Measuring performance by counting vehicles alone can obscure system efficiency problems. As an example, when Minnesota DOT converted HOV lanes to HOT lanes on Interstate 394, vehicle throughput across all travel lanes increased, but person throughput decreased as the share of vehicles shifted from high occupancy to single occupancy.[1] This has consequences for air quality measures; vehicle throughput could increase while emissions per passenger could increase. PPPT measures would encourage services and programs to be implemented to ensure that HOT lanes, or similar facilities, increase person throughput to achieve their maximum potential.

Finally, PPPT, as will all performance measures, has implicit policy implications. The way in which a system is measured tends to influence decision-making about the system. Measurement that focuses solely on vehicle counts could encourage or favor a reliance on vehicle-oriented solutions that unintentionally limit investment choices.

[1] See: Kenneth R. Buckeye. "I-394 MnPASS: Performance Update." Accessed April 8 2013. < www.ite.org/councils/HOTlanesPresentation.ppt>.

The Focus on People: Illustrative Annecdote:
Chris rolled out of bed, checked the weather out the window and decided to ride his bike to work 5 miles today to shed those extra pounds. At the same time, his next door neighbor, Juanita, rushed out the door while checking the predicted arrival time of the 24 mile commuter train on her smartphone. "Thank goodness my company subsidizes the cost of my train trip and not just parking." she mutters. Stu waved at her while driving to the park and ride lot to pick up 2 passengers so he can use the new managed lanes for free and cut his 22 mile commute by 30 minutes. Using only vehicle trip performance measures, only Stu's vehicle trip on I-95 would get counted as part of state DOT performance measures while these three neighbors plus two casual carpoolers/sluggers all use different modes for the same purpose. Also lost are the effects of employer-provided transit subsidies on travel behavior.

Data Sources

Much of the multi-modal data needed to assess PPPT is currently being collected in various regions, but data collection and assessment practices vary, consistent with the resources and needs of each region. Thus, we recommend that USDOT adopt a tiered, phased approach to data collection for PPPT calculations that permits states and MPOs to begin with methods that utilize existing data collection programs and standardize data collection over time. FHWA provides similarly flexible standards for states in generating data for the Highway Performance Monitoring System. [2]

Existing sources of occupancy data include:

- Regional household travel surveys
- Corridor planning studies
- American Community Survey / Census Transportation Planning Package
- National Household Travel Survey
- Vehicle crash data
- National Transit Database
- Permanent bicycle and pedestrian counters
- Transit ridership data – manual or automated passenger counts
- Managed lane transponders

Other sources currently being developed or undergoing investigation and refinement:

- Photographic detection
- In-vehicle systems (e.g., detecting passengers for proper air bag deployment through propriety systems such as General Motors' OnStar)
- Infrared sensors

FHWA/USDOT should provide guidance on sampling and extrapolation techniques to arrive at person throughput based on the various data sources presented above. It should also work with MPOs and state DOTs to create milestone time periods in which the estimates will be supplemented or replaces with more rigorous data collection and analysis methods.

Over time, USDOT should revise its data-collection standards to require more frequent observations with coverage of more corridors. For example, a state DOT or MPO could begin collecting person

[2] See "Highway Performance Monitoring System (HPMS): Frequently Asked Questions." http://www.fhwa.dot.gov/policyinformation/hpms/faqs.cfm.

throughput by multiplying vehicle counts with occupancy data derived from the ACS/CTTP, and other nationally-available regional-level data to establish baselines. That region would later move to route-specific collection methods, such as traveler survey with route and time data; license plate survey; or, field collection.

Simultaneously, USDOT can provide guidance and/or requirements to improve data collection for PPPT calculations. For example, USDOT could encourage or require that regional traveler surveys and household travel surveys include questions about routes taken for trips so as to more accurately estimate occupancy for specific corridors.

Method for Calculation

Depending on the assessment objectives, the data collected for PPPT could be analyzed at a corridor level of a regional level. Shown below are sample approaches that could be used for each of these geographic scopes.

- Corridor

    1. Select corridors and corridor segments. States and MPOs would have the discretion to designate corridor segments and to group parallel infrastructure (e.g., a roadway and neighboring bike path) based on their shared carrying of travel.

    2. Select peak periods to be measured. States and MPOs would have the discretion to decide which periods of the week and day qualify as the peak for each corridor.

    3. For each corridor segment and each day, sum the number of passengers moving across that segment on all relevant modes. Morning and evening peak should be calculated separately, since travel patterns for these two times of day are distinctly different.

    4. Monthly, yearly, or other time periods can be calculated by taking the average value for each day's peaks within that time period.

    5. Where data on various modes is available at different time scales, sum passenger movement at the smallest common time scale by averaging the values for the data available at smaller time scales.

- Region

    1. Define the region to be measured.

    2. Select corridors to be included in a regional calculation. At minimum, this should include NHS routes, though MPOs and States should have the discretion to add corridors.

    3. Select peak periods to be measured. For clarity, states and MPOs should designate the peak period for the entire region's transportation network, even if certain corridors experience their peaks at different times.

4. Sum the number of passengers moving across all corridors separately for morning and evening peak periods.

5. Where data on various modes is available at different time scales, sum passenger movement at the smallest common time scale by averaging the values for the data available at smaller time scales.

6. Monthly, yearly, or other time periods can be calculated by taking the average value for each weekday's peaks within that time period.

Benchmarks and Targets

Benchmarks and targets for increasing PPPT should be set by MPOs and state DOTs with consideration for local conditions. USDOT should allow for and provide guidance on setting separate targets for different place types. At minimum these different place types could be based on population and density thresholds, and categories that would include:

- Large Urban
- Large Suburban
- Small Urban/Suburban
- Rural

Reporting and Performance Evaluation

Though states and MPOs will have discretion to define regions, USDOT should set reporting guidelines based on standard or characteristic place types such that system performance can be compared across and within regions without distortion. The expected level of performance – as defined as any measure of congestion – will be considerably for an urban area than a rural area. And even within a region, performance expectations will be different for road facilities of different types. For example, a largely rural region should report its regional vehicle throughput on rural highways separately from its urban arterials, so that performance on each is only compared with the performance of similar corridors in other regions. It should be recognized that while it is important to establish a range of place-type groupings to allow for like-to-like comparisons, many factors even within such grouping could affect performance and person throughput. These include development patterns and densities, type and amount of transit service, availability of HOV/HOT facilities, and the like. Such groupings should be used to establish general expectations, but the primary measure of progress in performance should be comparison of each corridor against itself over time as periodic evaluations are conducted.

3. CMAQ Performance Measure Suggestion:

We note that accepted methodologies are currently available to estimate CMAQ project benefits for both CMAQ's congestion mitigation and emissions reduction objectives. We support continued use of a range of approaches, so long as they are sufficiently rigorous. Our particular suggestion is that TDM programs that serve regions or areas be allowed to document benefits to congestion mitigation and air

quality through measuring vehicle trip reduction, vehicle mile of travel reduction, and emissions reduction and that they not be required to assign regional impacts to specific corridors unless projects are oriented to individual corridors.

Method for Calculation

We support using the methods calculated through current CMAQ reporting procedures to calculate the non-corridor trip-reduction benefits of eligible programs. We recommend that states and MPOs, wherever possible, use modeling assumptions based on local surveys of program outcomes in order to produce the most accurate estimates of trips and emissions reduced.

Vehicle Trip and emissions reduction impact calculators are in use in a number of areas which can be tailored for use by any TDM program. These use as inputs the activities of TDM agencies to encourage mode shift and use calculations including universe of target population, participation rates, and trips reduced as outputs. These are survey-based and use factors specific to the region or area served, but could be adapted to other areas using comparable default values at first and refining them with surveys specific to the area being served. Outputs include net trips shifted from Single Occupant Vehicles to other modes. VMT is based upon the average trip length for the particular region, and emissions reduced are derived from specific emission rates for the area's vehicle fleet, which are data commonly used by MPOs and Air Quality Non-Attainment or Maintenance Areas.