



# MAP-21 Target-Setting Exercise

## Background Resources

### Document Overview

This document is designed to support the AASHTO SCOPM MAP-21 Target-Setting exercise. It includes material specific to the Congestion Mitigation and Air Quality (CMAQ) performance area. It presents targeted excerpts from documents that have already been developed through previous Task Force activities. This document also contains selected information from research conducted through the NCHRP 20-24(37) Comparative Performance Measurement series. The appendix contains a brief CMAQ Performance Measure Factsheet produced through a previous effort of the SCOPM Task Force.

This document is organized into three sections:

#### 1. General Target-Setting Recommendations

SCOPM Task Force Findings on MAP-21 Performance Measure Target-Setting (3/13)

#### 2. CMAQ Performance Area Recommendations

SCOPM Task Force Findings on MAP-21 Performance Measure Target-Setting (3/13)

SCOPM Task Force Findings on National-Level Performance Measures (11/12)

SCOPM Task Force Workshop on National Performance Measures Background Paper (9/12)

#### 3. Appendix

Performance Measure Factsheet

Additional information is available at the Target-Setting Exercise website:

<http://sites.spypondpartnes.com/targetsetting/cmaq>

# 1. General Target-Setting Recommendations

## 1.1. Target-Setting Overview

The findings on of the SCOPM Task Force with regard to MAP-21 target-setting requirements included in this document are based on the following interpretation of the related MAP-21 target-setting requirements:

- A set of standard, consistent national performance measures will be established, but states will have flexibility to establish the target values of those measures. Thus, the term “consistent” applies to the performance measures, data methodologies (collection, processing and analysis), and performance reporting processes. There is no presumption that targets will be consistent across states – rather they will be specific to local conditions and needs and at set at the discretion of DOTs and MPOs.
- States must submit biennial reports on progress toward target achievement for each national measure.
- For the Highway Safety Improvement Program, states that have not made significant progress towards meeting established targets face reductions in funding flexibility and additional reporting requirements.
- For the National Highway Performance Program (NHPP), states that do not make significant progress towards meeting their established targets for asset condition or performance must report actions that they will undertake to achieve the targets.

## 1.2. Target-Setting Findings and Recommendations

The findings of the SCOPM Task Force with regard to target-setting center around three general findings and eleven recommendations.

### 1.2.1. General Findings

- **First**, State DOTs request maximum flexibility when setting performance targets. Every state and municipality faces different constraints and opportunities affecting their transportation system. Funding levels and sources vary, as do environmental conditions, population growth trends, and legislative and gubernatorial mandates and priorities. Flexibility in target-setting allows states and municipalities to face the realities of their unique situations. Furthermore, accountability should be based on what states can accomplish with their shares of federal funding.
- **Second**, consistent with the National-Level Guiding Principle #2 (see page 3), *Specificity and Simplicity*, MAP-21 rulemaking should encourage States DOTs to adopt performance targets that are attainable and realistic. These targets should be periodically reevaluated and adjusted

to reflect risks, revenue expectations, and strategic priorities. In addition, the State DOTs agree that consistent data collection and analysis methods are essential to ensure that national-level measures and reporting use comparable data.

- **Third**, in keeping with National-Level Guiding Principle #3 (see page 3), *Possession is 9/10ths of the Law*, the establishment of performance targets can provide a focal point for action and a basis for accountability. However, it is important to recognize that for several of the national-level performance measures, State DOTs have relatively limited control over outcomes. There are many externalities that could affect a State DOT attaining certain performance targets from economic to social forces. For example, the effect of background changes in traffic related to economic conditions can overwhelm any deliberate actions on the part of a state to improve safety or reduce traffic delay. Generally speaking, State DOTs have more control over achieving targets related to asset condition and less control over performance measures associated with safety and system performance.

### 1.2.2. Specific Recommendations

The following are specific recommendations of the SCOPM Task Force that should be considered in drafting specific rules for implementation of the target-setting provisions of MAP-21:

#### **Provide maximum flexibility**

- Regional, local, or other targets are to be established by states or MPOs as appropriate when necessary. Baseline conditions may vary significantly state-to-state and region-to-region.
- Many factors, such as population growth and environmental conditions affect performance outcomes for metrics like congestion and pavement. Therefore, maximum flexibility is required for target-setting.

#### **Focus on what matters – the right outcome**

- Target-setting should not focus on a single target value for a performance measure but on achieving improved performance over time.
- States and MPOs often have to make priority decisions based on customer and stakeholder requirements. Each state and MPO must consider these requirements – which will vary from state to state – within its target-setting process.
- The value of performance management is found in better decision-making, not target achievement. DOTs support the idea of allowing states to establish ranges of acceptable performance outcomes. Use of ranges can provide DOTs with a more nuanced way of discussing performance outcomes across multiple competing objectives.

### **Align targets with system ownership and funding levels**

- Targets set for federal performance measures should be aligned with federal funding levels as state DOTs and local partners may or may not have multiple funding sources in addition to federal funds.
- Diverting state funds to meet federal requirements may not be an option. State funding is typically used to match federal funds and allocated to meet state obligations and priorities set by state government such as non-federal-aid eligible maintenance activities.

### **Base target-setting on longer term trend data**

- Targets cannot be set in isolation of solid baseline and reliable, quality, multi-year trend data.
- The expansion of the NHS in MAP-21 has provided challenges as baseline and multi-year data may not be available for the full NHS system.
- Long term viewpoints and multi-year efforts should be considered in target-setting; one data point should not be used to evaluate a program.

### **Coordinate target-setting through a continuing, cooperative, and comprehensive process**

- The development of state, MPO and transit provider targets should be coordinated through a 3C (continuing, cooperative and comprehensive) planning process. This process should result in MPO targets that are attainable given the level of investment a DOT plans to make in a metropolitan planning area (MPA) over a particular time-horizon. Whenever possible, DOTs and MPOs should use consistent (i.e. equivalent) targets to assess the condition and performance of state highways within an MPA.
- Only hold state DOTs and MPOs accountable for what they manage and control. Those who set targets should be those who manage and fund the system and are held responsible for compliance.
- Agencies should not be penalized for not meeting targets due to circumstances beyond their control.

### **Tell the story: performance is more than just a number**

- Analysis and reporting on achieving targets should be both qualitative and quantitative:
- Target-setting should reflect a good faith effort and provide qualitative and quantitative reasoning, as appropriate, to support the results of failing to meet specific targets. For example, states and MPO should be given the opportunity to explain how available resources and other factors such as population dynamics and environmental factors influenced the failure to meet specific targets.
- State DOTs are under increasing pressure and scrutiny from the public regarding investments of public funds and the quality of services provided. While defining measures, setting targets, and aligning strategies to achieve the targets can all positively affect the performance of the state DOTs, these actions will do little to increase the credibility of DOTs unless there is a

reliable, transparent, and understandable method of reporting the progress in achieving the performance targets.

### **Avoid unachievable targets or the “one size target fits all approach”**

- Funding constraints should be factored into the process for determining what values to use for targets. DOTs and local partners work within resource constraints, and cannot be expected to perform to a uniform level (target value) on all measures.
- Targets should reflect realistic expectation about what can be achieved through transportation investments.

### **Allow for appropriate timelines for target achievement**

- Allow for appropriate timelines for achieving targets as a measurable change or progress toward targets may take many years to be noticeable. These may vary by performance area and measure.
- In addition, time horizon (short vs. long-term) for targets should be allowed to vary depending on the measure and at the discretion of each state. For example, safety measures could use the 5 year projection of the 5-year moving average to set targets; annual reports would demonstrate progress using these projections.
- At each DOT’s discretion, targets should be regularly reevaluated and adjusted to reflect evolving risks (e.g. new revenue expectations, changing strategic priorities, etc.)
- At each DOT’S discretion, targets should be reviewed and revised periodically to confirm the selected target is still suitable for achieving the required results.

### **Guard against unintended consequences**

- Consider how targets set for one measure could have unintended consequences for the performance of another measure due to resources shifting to other priorities.
- Targets could drive a “worst first” prioritization approach, risking neglect of long-term system needs. A sustainable, efficient transportation system must place a high priority on system maintenance, preservation, and maximizing asset life while minimizing overall life cycle costs.
- Worst first prioritization can lead to unintended consequences in the system. For example, International Roughness Index (IRI) targets could lead to smooth pavements with deteriorating structural conditions. The IRI target could also prompt states to address the wrong problems, and inadvertently shorten pavement life, instead of lengthening it.

### **Complement flexibility in target-setting with transparency and accountability**

- Setting targets should be accompanied by a rationale for selecting the specific target value.
- When states and MPOs do not meet performance targets, they should describe what they have done to improve performance, how those actions impacted the performance, and why they have not met the target.

### **Allow flexibility for DOTs and MPOs to use a risk based target-setting approach**

- Risk-based targets do not reflect optimal outcomes within a particular investment area; rather, risk-based targets represent strategic objectives within a plan to manage agency risks.
- Risk-based targets are meaningful in that they can be realistically achieved under existing revenue expectations. Unlike aspirational targets, risk-based targets can be managed.
- Risk-based targets are derived from risk assessments and revenue expectations at a point in time; Targets should be continuously reevaluated as risks and revenue expectations evolve.

## 2. Congestion Mitigation and Air Quality (CMAQ) — Performance Area Recommendations

### 2.1. Measures

- **Criteria Pollutant Emissions**—Daily kilograms of on-road, mobile source criteria air pollutants (VOC, NO<sub>x</sub>, PM, CO) reduced by the latest annual program of CMAQ projects.
- **Annual Hours of Delay (AHD)**-Travel time above a congestion threshold (defined by State DOTs and MPOs) in units of vehicle-hours of delay reduced by the latest annual program of CMAQ projects.

### 2.2. Targets

#### 2.2.1. Emissions

- AASHTO supports state flexibility in the setting of targets; as provided in MAP-21. To that end, affected states and MPOs should have flexibility to set their own targets for the national reporting of the CMAQ On-road Mobile Source Emissions performance measure. Affected State DOTs and MPOs should work together to establish targets. Targets should be required only for areas required to report emissions reductions which are those States and MPOs that serve TMAs with populations of over 1 million and that are nonattainment or maintenance areas. This ensures alignment of the MAP-21 measures with CMAQ ‘performance plan’ requirements in MAP-21, which apply only to those MPOs serving TMAs with populations of over 1 million and that are nonattainment or maintenance areas.

#### 2.2.2. Delay

- AASHTO supports state flexibility in the setting of targets; as provided in MAP-21. To that end, affected states and MPOs should have flexibility to set their own targets for the national reporting of the CMAQ traffic congestion performance measure. Affected State DOTs and MPOs should work together to establish targets. Targets should be required only for areas required to report emissions reductions which are those States and MPOs that serve TMAs with populations of over 1 million and that are nonattainment or maintenance areas. This ensures alignment of the MAP-21 measures with CMAQ ‘performance plan’ requirements in MAP-21, which apply only to those MPOs serving TMAs with populations of over 1 million and that are nonattainment or maintenance areas.

### 2.3. Methodology

#### 2.3.1. Emissions

AASHTO supports continuation of a flexible approach for measuring CMAQ project emission reductions that is consistent with current CMAQ reporting practices and that gives states and MPOs freedom to choose calculation approaches that work best in the context of their region, while ensuring every effort is taken to make credible estimates that are based on reproducible and logical analytical procedures. Given the central role of MPOs in the current air quality planning process and in the new CMAQ performance plan requirements, working closely with MPOs on national measures is essential. AASHTO encourages FHWA to adopt an approach that allows states and MPOs to work together.

For example, as part of annual CMAQ reporting requirements, FHWA requires states and MPOs to report a quantitative estimate of expected emissions reductions attributable to each CMAQ project<sup>1</sup>. In some instances, FHWA allows projects to be bundled together for purposes of estimating benefits, or a qualitative estimate may be used in place of quantitative data. All data is reported electronically to FHWA via the web-based CMAQ Tracking System. Project sponsors and project types differ greatly and no single model is required by FHWA to calculate emissions reductions. Therefore, we recommend continued flexibility with FHWA's specification: "every effort must be taken to ensure that determinations of air quality benefits are credible and based on a reproducible and logical analytical procedure."

It is also important that FHWA maintain consistency with current practices with regard to national-level reporting of the on-road mobile source emissions measure. Estimation of on-road mobile source criteria pollutants for areas where most CMAQ dollars are spent is already required as part of Clean Air Act Amendments requirements and CMAQ program administration responsibilities. AASHTO recommends continuing current practices. To the extent USDOT would consider making any changes to current practices in this regard, such changes should be minimal and any new performance data and reporting should be consistent with current requirements, and with outputs of existing travel demand and air quality models.

### 2.3.2. Delay

AASHTO supports adopting a similar approach for traffic congestion as is done with on-road mobile source emissions. The methodology (including the procedures and tools) employed by most MPOs to calculate on-road mobile source emissions, could also be used to estimate traffic congestion reductions. Currently, reporting of the on-road mobile source emissions consists of a flexible approach for measuring CMAQ project emission reductions that is consistent with current CMAQ reporting practices and that gives states and MPOs freedom to choose calculation approaches that work best in the context of their region, while ensuring every effort is taken to make credible estimates that are based on reproducible and logical analytical procedures. Given the central role

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<sup>1</sup> Final CMAQ Program Guidance, FHWA (2008)

[www.fhwa.dot.gov/environment/air\\_quality/cmaq/policy\\_and\\_guidance/2008\\_guidance/index.cfm](http://www.fhwa.dot.gov/environment/air_quality/cmaq/policy_and_guidance/2008_guidance/index.cfm)



of MPOs in the current air quality planning process and in the new CMAQ performance plan requirements, working closely with MPOs on national measures is essential. AASHTO encourages FHWA to adopt an approach that allows states and MPOs to work together.

For example, as part of annual CMAQ reporting requirements, FHWA requires states and MPOs to report a quantitative estimate of expected emissions reductions attributable to each CMAQ project<sup>2</sup>. In some instances, FHWA allows projects to be bundled together for purposes of estimating benefits, or a qualitative estimate may be used in place of quantitative data. All data is reported electronically to FHWA via the web-based CMAQ Tracking System. Project sponsors and project types differ greatly and no single model is required by FHWA to calculate emissions reductions. Therefore, we recommend continued flexibility with FHWA's specification: "every effort must be taken to ensure that determinations of air quality benefits are credible and based on a reproducible and logical analytical procedure."

It is also important that FHWA maintain consistency between the national-level reporting of CMAQ traffic congestion and on-road mobile source emissions performance measures. Currently, estimation of on-road mobile source criteria pollutants for areas where most CMAQ dollars are spent is already required as part of Clean Air Act Amendments requirements and CMAQ program administration responsibilities. AASHTO recommends continuing current practices. To the extent USDOT would consider making any changes to current practices in this regard, such changes should be minimal and any new performance data and reporting should be consistent with current requirements, and with outputs of existing travel demand and air quality models.

## 2.4. MAP-21 Performance Measurement Requirements

- Performance Measures for States [§1203; 23 USC 150(c)(5)] The Secretary will establish performance measures for States to use to assess traffic congestion and on-road mobile source emissions
- States to Set Performance Targets [§1203; 23 USC 150(d)] States have 12 months from final rulemaking to set targets reflecting the established measures, with the option of setting different targets for rural and urbanized areas.
- States to Submit Biennial Performance Reports [§1203; 23 USC 150(e)] States have four years from the enactment of MAP-21 to submit a first biennial performance report addressing progress in achieving performance targets.
- Performance Plans Required for Non Attainment and Maintenance Areas [§1113; 23 USC 149(l)] Biennial performance plans required for MPOs serving TMAs with population over one million

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<sup>2</sup> Final CMAQ Program Guidance, FHWA (2008)

[www.fhwa.dot.gov/environment/air\\_quality/cmaq/policy\\_and\\_guidance/2008\\_guidance/index.cfm](http://www.fhwa.dot.gov/environment/air_quality/cmaq/policy_and_guidance/2008_guidance/index.cfm)

representing a maintenance or non-attainment area. Plans must include analysis of the impact of the State's program of projects on achieving air quality and congestion targets.

## 3. Appendix

# Performance Measure Factsheet

## Congestion Mitigation and Air Quality (CMAQ Program)

AASHTO  
SCOPM  
Communications  
Workshop

### Why it's Important

#### Air Quality (Pollutant Emissions)

- Motor vehicles are a significant source of emissions of particulates and the precursors to ground-level ozone (smog).
- The CMAQ measures help track how transportation agencies contribute to improvements in air quality.

#### Congestion

- Traffic congestion is a problem in many urban areas; if left unchecked, it can reduce quality of life and can harm economic prosperity.
- The CMAQ measures help track how transportation agencies manage congestion problems in major urban areas.
- Although CMAQ projects are usually small in scope (e.g., an individual intersection improvement), they can have a sizable impact on travel times in specific locations.

### Measure #1: Pollutant Emissions Reductions

#### What FHWA May Measure

**Simply put:** Amount of pollution reduced by CMAQ program.

**Technically speaking:** Daily kilograms of on-road, mobile source criteria air pollutants (VOC, NO<sub>x</sub>, PM, CO) reduced by the latest annual program of CMAQ projects

#### Language of the Measure

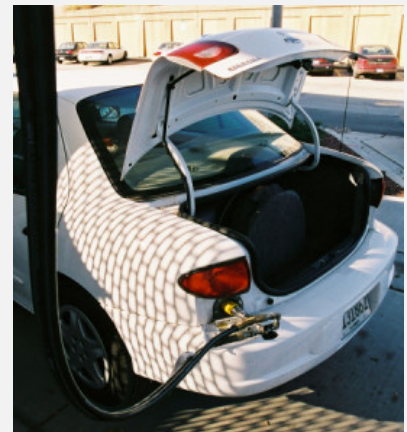
**Communicating at the right level.** The measure can be expressed in several ways. For example:

- “CMAQ projects approved by the DOT last year are eliminating 500kg of VOC and NO<sub>x</sub> per day”

If a large, aggregated number is hard to put in perspective, it can be expressed in other ways. Some examples include:

- By project – “A new traffic signal timing project is reducing smog forming pollutants by 33.5kg/day; an intermodal freight yard is reducing NO<sub>x</sub> by 1,000 kg/day, etc.”
- By region – “Special air pollution reduction projects in metro area XYZ are reducing smog forming pollutants by 250kg/day”

#### Visualizing it



### National Reporting Issues and Key Concepts

**Only applies to large cities.** This measure applies only to Metropolitan Planning Organization (MPO) regions that serve Transportation Management Areas (TMAs) with populations of over 1 million that are designated by the Clean Air Act as ‘nonattainment areas’ or ‘maintenance areas.’

**Comparisons are difficult.** Project sponsors and project types funded via CMAQ differ greatly from state to state, so ‘apples to apples’ comparisons are hard to make among states and may be subject to misinterpretation

**Not fully representative of air quality issues.** This measure is not a direct indicator of air quality or of the transportation sector’s contribution to air quality problems.

## Measure #2: Annual Hours of Delay (AHD) Reductions

### What FHWA May Measure

**Simply put:** Amount of congestion reduced by CMAQ spending

**Technically speaking:** Travel time above a congestion threshold (defined by state DOTs and MPOs) in units of vehicle - hours of delay reduced by the latest annual program of CMAQ projects.

### Language of the Measure

**Similar to Freight and System Performance.** The AHD measure is technically the same as measures proposed for the freight and system performance measures, therefore providing consistency when 'congestion' is discussed in the context of national performance measures.

**Communicating at the right level.** The measure can be expressed in a variety of ways. For example:

- "CMAQ projects approved by the DOT last year are eliminating 20,000 vehicle hours of delay per weekday rush hour"

If this large aggregated number is too hard to put in perspective, it can be expressed in other ways, such as:

- By project – "A new roundabout project increased average vehicle speeds from 15 mph to 29 mph, reducing average delay per vehicle from 47 seconds to 6 seconds"

### Visualizing it



### National Reporting Issues and Key Concepts

**Only applies to large cities.** This measure applies only to MPOs that serve Transportation Management Areas (TMAs) with populations of over 1,000,000 and that are air quality nonattainment or maintenance areas.

**Narrow focus.** The CMAQ congestion measure is narrowly focused on CMAQ projects only, while state DOTs are undertaking many other efforts to manage congestion.

**Comparisons are difficult.** Project sponsors and project types funded via CMAQ differ greatly from state to state, so 'apples to apples' comparisons are hard to make among states and may be subject to misinterpretation

### Congestion (CMAQ) Performance Communication Issues

Congestion CMAQ performance comes with its own set of communication challenges and issues, such as:

- CMAQ projects create a range of benefits not captured by the measures, including energy conservation, mobility and multimodal benefits
- The audience most interested in CMAQ measures (e.g. environmental advocacy groups) is also interested in the other benefits that CMAQ projects generate
- CMAQ measures may be particularly important to environment-focused stakeholders, but looking at CMAQ alone does not provide a comprehensive picture of how DOTs act as environmental stewards.