

**Congestion Mitigation and Air Quality
Improvement (CMAQ) Program**

A WHITE PAPER

Requested by:

**Association of Metropolitan Planning Organizations
(AMPO)**

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Disclaimer

This White Paper summarizes the results of a survey that AMPO conducted earlier this year. Members of the Air Quality Work Group provided input and suggestions. The contents of this Paper do not necessarily represent the views or position of any specific MPO or AMPO.

Purpose

The purpose of this White Paper is to share information collected in a recent survey of metropolitan planning organizations (MPOs) on the Congestion Mitigation and Air Quality Improvement (CMAQ) Program and to provide examples of different practices and approaches in four, key CMAQ program areas. This paper is organized in four parts as follows. For each of the four areas, we provide an overview, survey findings, and examples.

- Intrastate distribution of CMAQ funds,
- CMAQ project selection processes and criteria,
- Emissions reduction estimating methodologies for CMAQ-funded projects, and,
- CMAQ performance measures and target setting.

Background

The Congestion Mitigation and Air Quality Improvement (CMAQ) Program provides a flexible funding source to State and local governments for transportation projects that will help meet the Clean Air Act requirements. The program was initially created as part of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991¹ and has been continued over the next four federal transportation reauthorization bills: the Transportation Equity Act for the 21st Century (TEA-21)², the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)³, the Moving Ahead for Progress in the 21st Century Act (MAP-21)⁴, and the Fixing America's Surface Transportation Act (FAST)⁵ which expires on September 30, 2020.

The amount of funds appropriated under the CMAQ program has increased since 1991, from \$1 billion per year during ISTEA to \$2.449 billion under the FAST Act in FY2019. However, as a proportion of the overall surface transportation highway program, CMAQ appropriations have declined from 4% of total funding annually during ISTEA (1991-1997), to 0.6% of total funding annually under the FAST Act (2016-2020)⁶. Since this is the only Federal aid program that specifically provides funds to reduce on-road mobile source emissions, CMAQ remains an important program.

MAP-21 established performance-based planning requirements and those were continued in the FAST Act. Under these requirements, States and MPOs with nonattainment and maintenance areas are required to establish on-road emission reduction targets for CMAQ-funded projects and some MPOs are also required to establish traffic congestion reduction targets. The on-road emission reduction targets are directly tied to the CMAQ program in that MPOs and States will need to demonstrate that they are meeting their CMAQ on-road mobile source emissions reduction targets through their CMAQ investments.

Survey Overview and Respondents

In early 2019, the Association of Metropolitan Planning Organizations (AMPO) Air Quality Workgroup developed and conducted a survey (see Attachment A) on several aspects of the CMAQ program. The primary purpose of survey was to understand what methodologies are being used to estimate emission

¹ Sec. 1008, Pub.L. 102-240 (December 18, 1991).

² Sec. 1110, Pub. L. 105-178 (June 9, 1998).

³ Sec. 1808, Pub. L. 109-59 (August 10, 2005).

⁴ Sec. 1113, Pub. L. 112-141, (July 6, 2012).

⁵ Sec. 114, Pub. L. No. 114-94, (December 4, 2015).

⁶ <https://www.fhwa.dot.gov/fastact/funding.cfm>.

reductions associated with CMAQ-funded projects. The survey also asked MPOs about the intrastate distribution of CMAQ funds, project selection processes and criteria, and performance measure target setting. The survey was distributed in February 2019 and there were 62 MPO respondents in 32 states. This is about a fifteen percent response rate, an average response rate for surveys according to AMPO staff. However, since there are 12 states that do not have any nonattainment and maintenance areas, MPOs in those states may not respond to a CMAQ survey. Adjusting for this, we had an eighty-four percent response rate in states with nonattainment and maintenance areas.

As shown in Figure 1, 43 percent of respondents represented MPOs with more than 1 million population, 34 percent represented MPOs with 200,000-1 million, and 23 percent were MPOs with less than 200,000 population. Seventy four percent of respondents are in 37 Transportation Management Areas (TMAs). The MPOs that responded represent 131 nonattainment and maintenance areas for eight different National Ambient Air Quality Standards (NAAQS)⁷. Of these, 51 percent are large MPO regions, 38 percent are medium sized regions, and 11 percent are small MPO regions. See Figure 2. About half of the MPOs that responded are required to implement both the CMAQ on-road mobile source emission reduction measure and the traffic congestion reduction measures. Attachment B shows the MPOs that responded to the survey.

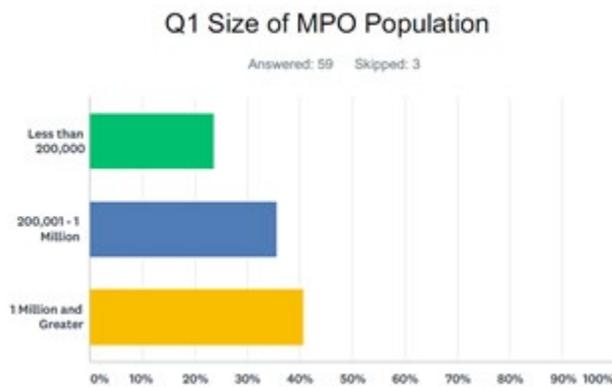


FIGURE 1

⁷ Ozone (2015, 2008, 1997) nonattainment or maintenance, PM2.5 (2012, 2006, 1997) nonattainment or maintenance, PM10 nonattainment or maintenance, carbon monoxide maintenance.

Q2 Is your MPO in a nonattainment or maintenance area (check all that apply)

Answered: 48 Skipped: 14

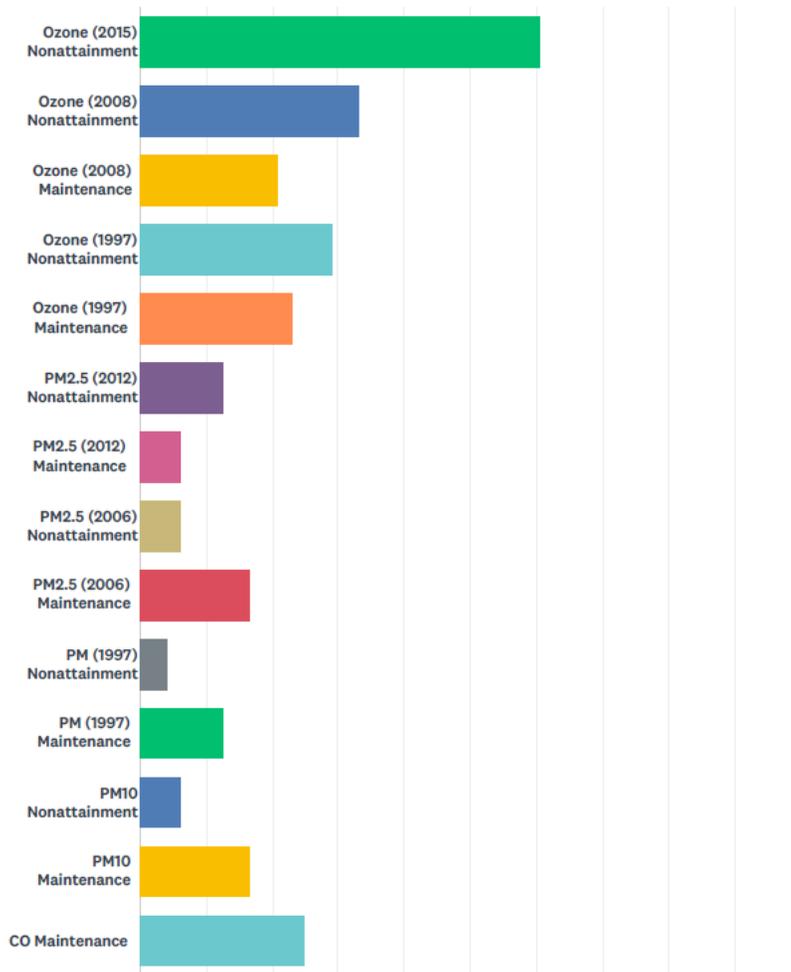


FIGURE 2

Intrastate Distribution of CMAQ Funds - Overview

Federal Appropriation of CMAQ Funds to State DOTs

The amount of funds each state receives annually under the CMAQ program is determined in accordance with the FAST Act⁸. For specific information on how the FHWA apportions CMAQ funds and 2019 apportionment tables see Attachment C. Once each state receives their apportionment, the state DOT decides how to allocate CMAQ funds within the state.

State Flexibilities

There are two major flexibilities that states have in deciding how to use CMAQ funds. Some states do not have nonattainment or maintenance areas at all and many states have nonattainment and/or maintenance areas in just a portion of the state. In such attainment states and areas within states,

⁸ Sec. 114, Pub. L. No. 114-94, (December 4, 2015).

states can use CMAQ funds on any project that is eligible under the Surface Transportation Block Grant (STBG) program.

Another flexibility is that MAP-21 enhanced states' ability to transfer funds to other programs. The MAP-21 provision for uniform transferability of Federal-aid highway funds⁹, allows states to transfer up to 50 percent of CMAQ apportioned funds each year to other federal surface transportation apportioned programs.

As noted above, when state departments of transportation (DOTs) receive their annual CMAQ apportionments, they have considerably flexibility in how they allocate funds within the state. There is limited flexibility with PM2.5 set-aside funds, however; these funds must be spent on projects in PM nonattainment and/or maintenance areas. FHWA encourages state DOTs to work with MPOs, air quality agencies, and other partner agencies in determining how funds will be distributed within each state. Regardless of how funds are distributed, the state DOT is responsible for program administration pursuant to FHWA and/or FTA guidelines. This includes ensuring that CMAQ-funded projects meet the program eligibility requirements.

Survey Findings

Since states have discretion as to the distribution of CMAQ funds within the state, one would expect many different approaches to CMAQ fund distribution throughout the country. We found this to be true in our survey and below are just three examples.

- 1) **State DOT manages program through a statewide process.** In this example, the state DOT manages the CMAQ program centrally and the MPOs or other project sponsors work directly with the state DOT to implement projects. This may involve the state determining the amount of CMAQ funds to be competed for within the state, setting project selection criteria, reviewing applications, and notifying MPOs of selected projects within their regions. This process can be as transparent as the state chooses but the state makes the ultimate decision on how much, if any, of the CMAQ funds are competed each year and all other decisions on the CMAQ program. See example in Attachment D (Tennessee).
- 2) **State DOT uses pre-MAP-21 apportionment formula.** In this example, the state DOT allocates CMAQ funds to each MPO region that includes a nonattainment or maintenance area based on the weighted population in each ozone or carbon monoxide nonattainment and/or maintenance area as a proportion of the total CMAQ funds appropriated to the state. The state DOT may allocate the PM2.5 set-aside funds to MPOs in PM2.5 nonattainment and maintenance areas based on the same population based formula. This relies on the apportionment formula prior to MAP-21 (2012) and some states are continuing to allocate CMAQ funds on this basis with some states updating population data to 2012. See example in Attachment E (Washington).
- 3) **Hybrid approach:** In this approach, the State DOT reserves funds off-the-top for ongoing projects (e.g., transit, public education, Traffic Operations Centers (TOCs), then determines funding amounts for each MPO region based on weighted population in ozone nonattainment and maintenance areas and carbon monoxide areas. This directs CMAQ funds to nonattainment and maintenance areas but

⁹23 U.S.C. 126 (a), as amended by Sec. 1509, Pub.L. 112-141 (July 6, 2012).

also serves as a continuing funding source for certain programs. See example in Attachment F (Michigan).

We found that the large and medium sized MPOs responded in roughly the same proportion to the question of whether the state DOT sub-allocates CMAQ funds to MPOs with nonattainment and maintenance areas. The smaller MPOs responses included a higher proportion of areas that did not know how the state DOT allocated CMAQ funds within their state but still the majority of small MPOs responses indicate that the state sub-allocates CMAQ funds to MPOs with nonattainment and maintenance areas.

CMAQ Funds Reserved for Ongoing Programs

As part of our survey, we asked if a specific amount or percentage of CMAQ funds is reserved each year for ongoing programs such as transit, traffic operations centers (TOCs), commuter choice programs or public education and outreach. Sixteen MPOs responded that some amount of funds is reserved each year while 22 MPOs responded no; sixteen MPOs did not know whether CMAQ funds are reserved off-the-top each year. See Figure 3. Nine MPOs indicated that, in their states, up to 25 percent of funds are reserved annually. Two MPOs said that 25-50 percent of funds are reserved and one MPO said that 50-100 percent of CMAQ funds are reserved each year for ongoing programs. Three other MPOs listed specific amounts reserved for rideshare and other programs.

Q14 Are some portion or specific amount of CMAQ funds in your State and/or MPO region reserved each year for specific ongoing programs (e.g. Transit, Commuter Choice Program, Incident Management Program, Traffic Operations Center (TMC), etc.)?

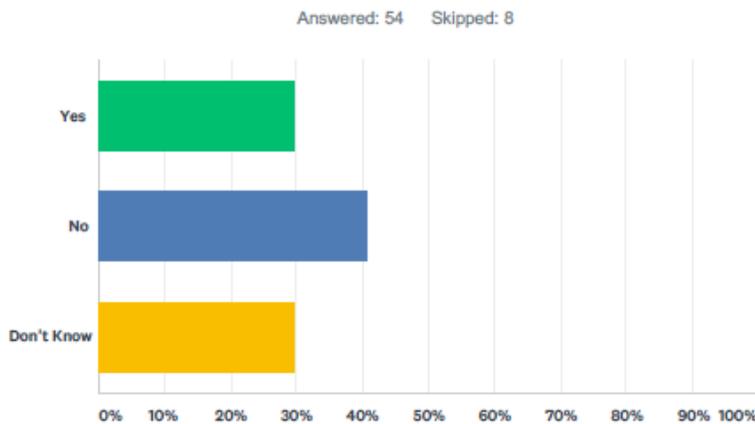


FIGURE 3

In large MPO regions, almost 40 percent of the respondents indicated that funds are reserved each year, in medium-sized MPOs, 22 percent and 17 percent of the smaller MPOs said yes to this question. Seventeen percent of large MPOs, 28 percent of medium-sized MPOs and 60 percent of small MPOs did not know the answer.

CMAQ Project Selection Process and Criteria - Overview

We found that regardless of how funds are distributed within a state, decisions on project selection are made using many different approaches. The majority of respondents said that there is a collaborative process for project selection between the MPO and the state DOT. After we discuss project selection criteria, we discuss three different project selection processes.

Project Selection Criteria

All CMAQ-funded projects must meet the following three criteria¹⁰:

- 1) Project must be transportation related;
- 2) Project must be generate emission reductions; and,
- 3) Project must be located in or benefit a nonattainment or maintenance area.

FHWA also urges states to consider cost effectiveness in project selection and has posted [cost-effectiveness tables](#) on their website to assist in this effort. When asked if cost effectiveness is used in project selection, more than half of our respondents (26) said yes, twenty-one said no and four did not know. See Figure 4.

Two other issues related to project selection were noted by survey respondents. First, Buy America requirements are making the implementation of the most cost-effective projects (e.g., diesel repowers, PM reducing projects, etc.) nearly impossible. This has become such a concern that some regions are not considering any projects for CMAQ funding that may get delayed or cancelled due to Buy America issues. It was also noted that project sponsors often do not understand the requirements for use of CMAQ funds and put forward projects that have marginal or questionable air quality benefits. It then becomes a challenge to prepare a sufficient air quality analysis to definitively demonstrate that a project has air quality benefits and thus, is eligible for CMAQ funds. Also, some projects may have eligible components but overall may increase capacity or even congestion (e.g. road diets or large intersection improvements that add travel lanes).

Q19 Does your agency use cost-effectiveness as a criterion in CMAQ project selection?

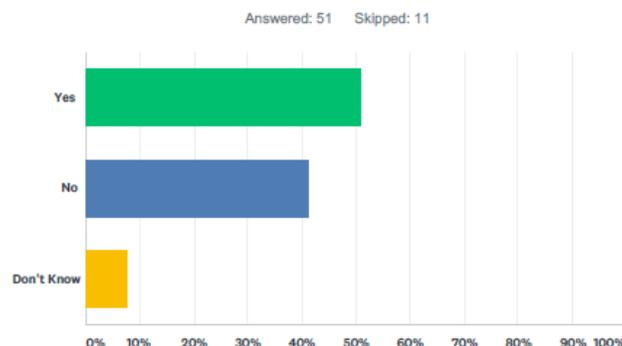


FIGURE 4

¹⁰ https://www.fhwa.dot.gov/environment/air_quality/cmaq/policy_and_guidance/2013_guidance/index.cfm

Survey Findings

In selecting projects for CMAQ funding we found in our survey that, in addition to emission reduction potential of projects, which is a basic eligibility requirement, there are many different criteria being used to select CMAQ projects. Below is a list of some of the project selection criteria that MPOs use in selecting projects for CMAQ funding.

Examples of project selection criteria:

- Cost-effectiveness (ton of emissions reduced per dollar expended)
- Assess highway peak Level of Service (LOS) before and after project implementation
- Congestion relief, trip reduction, emissions reduction, cost effectiveness, subjective evaluation, and inclusion in the regional plan.
- Consistency with the regional plan
- Projects on a corridor identified in Congestion Management Plans (CMP) as in need of improvement
- Project readiness
- Projects that support growth management
- Multi-modal and multi-agency projects
- Projects with a large local funding share (e.g. >20%) get priority
- Contribution to achievement of CMAQ on-road mobile source emission measure targets
- Reduced vehicle miles traveled
- Project sponsor track record in implementing projects and meeting federal requirements

Project Selection

Three approaches to project selection are discussed below.

State DOT conducts project selection process - We asked the MPOs if the state DOT makes the project selection decisions on CMAQ funds throughout the state. Fourteen MPOs said yes while 33 MPOs said no. In the cases where the state DOT selects projects, there is usually a competitive statewide process. For example, MPOs and other local agencies may submit proposed projects and emission reduction estimates to the state DOT for consideration and the state DOT makes the project selection decisions as shown in Attachment D (Tennessee).

MPOs with nonattainment and maintenance areas – stand-alone CMAQ project selection criteria and/or process – In this approach, projects are selected through a process established by the MPO with CMAQ specific criteria. This approach is used in 29 regions and most often either an annual or biannual project selection process is used. In some cases, a four-year process is used in parallel with updates to the Transportation Improvement Program (TIP). See an example in Attachment G (Chicago).

As shown in Attachment G, the Chicago region has a scoring system that includes transportation impact criteria with highway, transit and bicycle specific criteria, direct emissions reduction benefits including benefits to sensitive populations, annual health benefits and public fleet improvement. Also, projects that support regional priorities receive a score if the project is a component of a Long-Range Transportation Plan (LRTP) major capital project, supports inclusive growth, and supports transit density.

MPOs select projects using the same criteria for all types of projects. In this example, the MPO uses project selection criteria for all projects funded with federal, state and local funds (e.g. no funding “silos”). All projects must meet the selection criteria and the MPO and/or the state DOT decide which source of funds will be used for each project. All CMAQ-funded projects must meet the CMAQ eligibility requirements. See an example in Attachment H (Atlanta).

Emission Reduction Estimating Methodologies – Overview

All CMAQ-funded projects must be shown to have an air quality benefit by reducing CO, NO_x, VOC, and/or PM emissions¹¹. FHWA expects, with some exceptions, a quantitative emissions analysis be done for each project prior to funding. Emission reductions associated with some projects are difficult to quantify (e.g. public education, employer outreach, and marketing) and in those cases, a qualitative assessment is acceptable. There is no specific, required emissions analysis methodology common to all areas and State DOTs. MPOs have the flexibility to develop their own analysis tools or to use publicly available models and other procedures.

Now that many MPOs need to adopt on-road emission reduction targets for CMAQ-funded projects and demonstrate how, through CMAQ investments, the targets will be met, it is important to understand what methodologies are being used to estimate emission reductions. Several questions on our survey related to how MPOs estimate emission reductions for CMAQ projects including which agency inputs required data to the FHWA CMAQ Project Tracking system via the User Profile and Access Control System (UPACS).

Methodologies used

Survey Findings

About 60 percent of survey respondents indicated that the MPO develops the emission reduction estimates for CMAQ projects in their regions and these estimates are used in the FHWA-required annual reporting process. In other cases, state DOTs, transit agencies and project sponsors develop emission estimates for their projects. This can result in different methodologies being used within a state.

When asked about what agency inputs the project data in the FHWA CMAQ Project Tracking System in over 62 percent of areas, the state DOTs inputs this data to the FHWA CMAQ Project Tracking System.

We asked the MPOs what tools are used to develop the emissions reduction estimates and the results are noted in Figure 5. Fifty percent (23) of the respondents to this question indicated that they use the MOVES model and forty-three percent (20) use the [FHWA CMAQ Emissions Calculator](#). In 20 MPO regions a process has been developed by the MPO for estimating emissions, oftentimes using emission rates from MOVES or EMFAC. Almost 60 percent of large MPO areas and 50 percent of small MPO areas use MOVES for emission estimates. More than 53 percent of medium-sized MPO regions and 50 percent of small regions use the FHWA CMAQ Emissions Calculator. And 43 percent of MPOs of all sizes have developed MPO specific approaches to emissions analysis. In many cases, MPOs use a combination of the tools listed above for emissions estimating. The FHWA CMAQ Emissions Calculator Toolkit is relatively new and is being updated and expanded on an ongoing basis. The Toolkit appears to be a welcome technical assistance tool and one that MPOs are using.

¹¹ https://www.fhwa.dot.gov/environment/air_quality/cmaq/policy_and_guidance/2013_guidance/.

In California and Texas, the EMFAC and MOSER models are used, respectively. In one area, a process was developed by 8 large MPOs in the state. Other approaches include spreadsheet methodologies, consultant developed tools, and having project sponsors determine what tools to use.

Q18 What tools does your agency use to develop emission reduction estimates for CMAQ projects? (Please select all that apply)

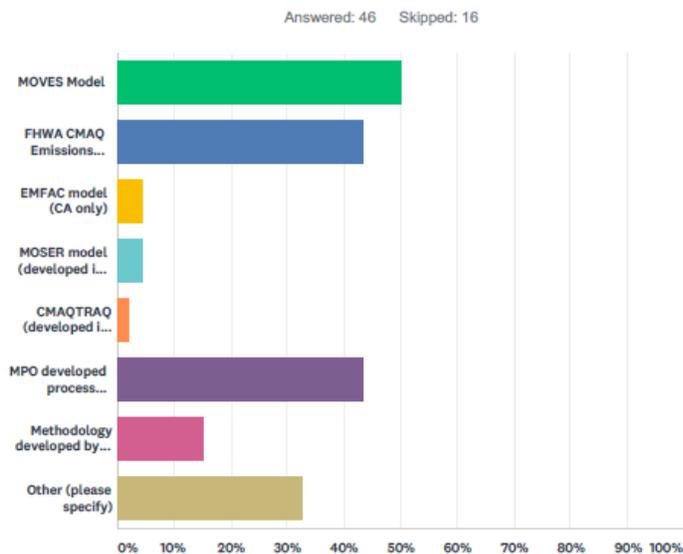


FIGURE 5

[State/MPO Developed Analysis Tool](#)

One example of a state/MPO developed analysis tool is in the Philadelphia region. The Delaware Valley Regional Planning Commission (DVRPC) has a tool, known as AQONE (Air Quality Off Network Estimator) that helps to project emissions reductions impacts for various CMAQ projects. AQONE is provided to all MPOs in Pennsylvania through a contract between Michael Baker Int'l and PennDOT. DVRPC uses a combination of AQONE and the FHWA CMAQ tool and EPA DEP (Diesel Repowers) for emissions analysis depending on several factors including data availability and which modules are most appropriate for the project in question. AQONE needs to be kept up to date with the latest version of MOVES.

[Issues related to emissions estimation](#)

Since the states and MPOs have discretion as to how emissions reduction estimates are calculated, there are many different approaches being used. Below are two issues we heard about in the survey responses.

- Lack of Consistency in Emissions Estimating Methodologies

One concern that was identified was that where a statewide project selection process is used and each MPO region decides which emissions estimation methodology to use, it is virtually impossible to equitably compare projects proposed by different MPO regions. This is happening in some states. This lack of statewide consistency may become an important consideration as the CMAQ on-road mobile source emissions performance measure is implemented.

- Emission rates are trending lower as vehicle fleet is getting cleaner

We also heard some concern about analysis tools and the challenge in keeping them updated to reflect current emission trends. Another related issue is that since vehicles are getting cleaner (and this should be reflected in the analysis), cost-effectiveness of potential CMAQ projects is also going down which may impact project selection.

CMAQ Performance Measures – Target setting and reporting - Overview

Federal statute and rules¹² that focus federal transportation investments on achieving performance outcomes were initiated under MAP-21 and continued under FAST Act. These include performance measures to assess progress toward achieving the goals of the CMAQ program. The National Performance Management Measures rule¹³ identifies traffic congestion measures and on-road mobile source emission reduction performance measures. These are shown below in Table 1 along with the number of MPOs and states impacted by these requirements.

Table 1. CMAQ Performance Measures

Topic Area	Performance Measure	Applicable Geographic Area	Approximate number of MPOs/states impacted ¹⁴
Traffic congestion	Percent of non-SOV travel	Urbanized area	44 MPOs/32 state DOTs
Traffic congestion	Annual hours of peak hour excessive delay (PHED) per capita for travel on the NHS system	Urbanized area	44 MPOs/32 state DOTs
On-road mobile source emissions reduction	Total emissions reduction for applicable pollutants and precursors for CMAQ-funded projects in designated nonattainment and maintenance areas	Nonattainment or maintenance area	119 MPOs/42 state DOTs. Of the 119 MPOs, 46 MPOs required to submit a CMAQ Performance Plan Part 490.107(c) and establish both 2-year and 4-year targets for this measure. Part 490.105(f) (6) (iii).

Target Setting Approaches

Survey Findings

More than half of survey respondents are required to establish both 2-year and 4-year traffic congestion performance targets and the CMAQ on-road mobile source emission reduction target. As part of our survey, we asked several questions about performance plans and target setting.

Many approaches are being used to set targets for these performance measures as shown in our survey. Below is a list of some of the approaches identified by survey respondents.

- Adopt targets set by state DOT using Excel spreadsheet-based emission reduction estimates of all CMAQ-funded project emissions.
- MPO developed alternative targets for analysis and adopted them locally in coordination with the state DOT.

¹² 23 USC 150, 23 CFR Parts 450, 490 and 771 and 49 CFR Part 613.

¹³ 23 CFR Parts 490.707 and 490.807

¹⁴ https://www.fhwa.dot.gov/environment/air_quality/cmaq/measures/cmaq_applicability/index.cfm

- Targets were set by averaging previous emission reductions (and projecting them into the future) and estimating benefits from specific planned projects.
- Adopted the state DOTs targets and agreed to program projects to contribute towards achieving the CMAQ on-road mobile source emissions reduction target.
- Looked at future programmed CMAQ funds and the emissions associated with those projects and then discounted for changing emission rates and delivery rate of the program.
- State DOT initiated and took the lead on proposing targets, which we reviewed and commented on. Bigger issue was determining the correct baseline numbers to build from. Ended up taking a very conservative approach to target setting.

Below are two brief examples of approaches to target setting from our survey responses. Attachment I provides a more detailed example of target setting in the Boston, MA region.

CMAQ On-Road Mobile Source Emissions Reduction Measure Target Setting Process. *South Jersey Transportation Planning Organization.* Emissions benefits from CMAQ projects programmed from FY2014-2017 (within the South Jersey Transportation Planning Organization (SJTPO) region) were summed up. Emissions benefits of Statewide/No MPO assigned projects were distributed among each of the three MPOs within NJ. One-time “heavy hitter” projects that were unlikely to be implemented in the future were not considered in the target setting. The FY2014-2017 emission reductions (with some adjustments as mentioned above) served as the baseline. From this baseline, targets were developed, using average emissions rates developed using MOVES2014a. The future forecasts also reflect the vehicle fleet getting cleaner, leading to declining returns in emissions reduction for the same trip/delay reduction. New Jersey’s statewide targets were the sum of each of its three MPO targets.

CMAQ On-Road Mobile Source Emissions Reduction Measure Target Setting Process. *[Respondent did not identify agency.]* We used the data reported in the User Profile and Access Control System (UPACS) to establish emission reduction trends. We prepared and reviewed the emission reduction analysis in cooperation with the State DOT. The trends were meaningless because the UPACS reports project benefits in the year the project is initially funded, not the year when it was approved or implemented. So, some years had lots of projects, and some years had few but that was the specific instructions given for preparing the CMAQ plan. Also, vehicle emissions are continually decreasing so CMAQ targets need to account for the declining benefits of emission reduction projects

[Processes and agreements for coordination on target setting, updating, and reporting.](#)

We asked the MPOs if there was a written process or agreement between the state DOT and MPOs on how targets are set, updated and reported on. More than 75 percent of respondents indicated that there is an agreement with the state DOT with about 14 percent having a written process. Twenty-six percent of respondents indicated that there is not yet an agreement or process within their states.

[Other tools needed to meet the requirement to develop a CMAQ Performance Plan](#)

Over 40 MPOs with nonattainment or maintenance areas have over 1 million population and therefore required to develop a CMAQ Performance Plan. In our survey we asked for some suggestions for additional or improved tools to help facilitate the implementation of the performance measures. The only suggestion we received was the need for better information from the CMAQ Public Access System.

CONCLUSION

The AMPO survey found many examples of how MPOs are working with CMAQ program funds to identify and implement projects that reduce on-road mobile source emissions. Since the program is very flexible, we found many different examples of how states allocate funds within their states. We also found that project selection processes and criteria differ within states and between MPO regions. With respect to emissions estimating, most MPOs used MOVES, the FHWA CMAQ Emissions Calculator, or an MPO developed process. This suggests that there may be some consistency emerging across MPOs and states as to how emissions reduction estimates are done for CMAQ-funded projects. Finally, we also found many different approaches to setting performance measure targets in our survey. Since the performance-based planning process is relatively new, we cannot draw any conclusions about the target setting process or whether MPOs and states are going to achieve their CMAQ on-road mobile source emission reduction targets through CMAQ investments.

ATTACHMENT A – CMAQ SURVEY

CMAQ EMISSIONS ESTIMATION METHODOLOGIES QUESTIONNAIRE

GENERAL QUESTIONS:

- 1) Size of MPO population
 - a. Less than 200K
 - b. 200K-1 M
 - c. 1 Million and greater
- 2) Is your MPO in a nonattainment or maintenance area (check all that apply)
 - a. Ozone (2015)
 - i. Nonattainment
 - b. Ozone (2008)
 - i. Nonattainment
 - ii. Maintenance
 - c. Ozone (1997)
 - i. Nonattainment
 - ii. Maintenance
 - d. PM2.5 (2012)
 - i. Nonattainment
 - ii. Maintenance
 - e. PM2.5 (2006)
 - i. Nonattainment
 - ii. Maintenance
 - f. PM (1997)
 - i. Nonattainment
 - ii. Maintenance
 - g. PM10
 - i. Nonattainment
 - ii. Maintenance
 - h. CO
 - i. Maintenance
- 3) TMA Area
 - a. Yes
 - i. If yes, what is the TMA population
 - ii. If yes, how many MPOs within the TMA
 - b. No
- 4) Select all the below that apply
 - a. My MPO must submit a CMAQ Performance Plan
 - i. Yes
 - ii. No
 - b. My MPO must implement the On-Road Mobile Source Emission Performance Measure
 - i. Yes
 - ii. No
 - c. My MPO must implement the Traffic Congestion Performance Measures (PHED and non-SOV)
 - i. Yes, during the first performance period
 - ii. Yes, during the second performance period
 - iii. No
- 5) Briefly describe how your agency ensures that, when there is staff turnover, other staff will be knowledgeable about the CMAQ program and performance measure requirements.
- 6) How do you learn about new information and activities happening in the CMAQ Program? (e.g., newsletter, websites, other MPOs, AMPO emails, etc.) [check all that apply]
- 7) Have you or any other MPO staff participated in a training on the CMAQ program in the last 12-18 months? (Maybe in person, webinar, or as part of a larger meeting)
 - a. Yes

- b. No

CMAQ PROGRAM AND PROJECT SELECTION PROCESS:

- 1) Does the state DOT make all project selection decisions for CMAQ funds throughout the entire state (e.g., no MPO involvement)?
 - i. Yes
 - ii. If yes, is there a competitive process?
 - iii. No
 - iv. Don't know
- 2) Does the State DOT sub allocate CMAQ funds to the MPOs/counties with nonattainment and/or maintenance areas?
 - a) Yes
 - b) No
 - c) Don't know
- 3) Is there a collaborative process between the State DOT and the MPO for project selection?
 - i. Yes
 - ii. No
 - iii. Don't know
- 4) Does the MPO conduct a stand-alone project selection process (e.g., used exclusively for potential CMAQ projects) within the MPO region?
 - i. Yes
 - ii. If yes – annually, biannually, every four years, other frequency
 - iii. No
 - iv. Don't know
- 5) Are some portion or specific amount of CMAQ funds in your State and/or MPO region reserved each year for specific ongoing programs (e.g. Transit, Commuter Choice Program, Incident Management Program, Traffic Operations Center (TMC), etc.)?
 - i. Yes
 - a) If yes – 100%, 50-99%, 25%- 50%, less than 25%
 - b) Specific dollar amount
 - ii. No
 - iii. Don't know
- 6) If there are no nonattainment or maintenance areas in your state, does the state DOT use the CMAQ funds for any project eligible under the STBG program?
 - i. Yes
 - ii. No
 - iii. Don't know

EMISSIONS ESTIMATION AND REPORTING:

- 1) Which agency develops the emissions reduction estimates for each CMAQ project that are used in the required annual reporting process?
 - a. MPO
 - b. State DOT
 - c. Transit agency
 - d. Other (e.g. project sponsor)
 - e. It varies.
- 2) Which agency enters the CMAQ data into the FHWA CMAQ Project Tracking System via the User Profile and Access Control System (UPACS)?
 - a. MPO
 - b. State DOT
 - c. Transit agency
 - d. Other _____
- 3) What tools does your agency use to develop emission reduction estimates for CMAQ projects? (Please select all that apply)
 - a. MOVES model

- b. FHWA CMAQ Emissions Calculator
 - c. EMFAC model (CA only)
 - d. MOSER model (developed in Texas)
 - e. CMAQTRAQ (developed in New York)
 - f. MPO developed process internally (e.g. CMAP in Chicago)
 - g. Methodology developed by state DOT used in all MPOs in state (e.g. NY)
 - h. Other – please describe
- 4) Does your agency use cost-effectiveness as a criterion in CMAQ project selection?
- a. Yes
 - b. No
 - c. Don't know
- 5) Please list any CMAQ project selection criteria that your agency uses in addition to emission reductions potential of projects.

CMAQ PERFORMANCE PLAN, TARGETS AND REPORTING: (If applicable)

Since the CMAQ performance plan and related requirements are relatively new, we are collecting information on the institutional relationships and agreements that are in place to implement the CMAQ performance plan including target setting and reporting for the on-road mobile source emission reduction measure. The target setting and reporting requirements are different for large and small MPOs so please answer only the following questions that apply to your MPO.

- 1) Does your MPO need to develop (check all that apply)
- a. 2-year targets
 - b. 4-year targets
 - c. Both 2 and 4-year targets (e.g., MPOs over 1 Million)
- 2) Briefly describe the approach used by your MPO, in conjunction with the state DOT, to set targets for the CMAQ on-road emission reduction measure
- 3) Does your MPO have agreed-upon roles and responsibilities for target setting and reporting within your agency and with your partner agencies (e.g., state DOT)
- a. Yes
 - b. No
 - c. Don't know
- 4) Is there a formal, written process or agreement with the state DOT for how targets are being set, updated, and reported on?
- a. Written process
 - b. Agreement
 - c. Both
 - d. Neither
- 6) Are there other tools that your agency needs to be able to meet the requirement to develop a CMAQ performance plan?

ATTACHMENT B – Survey Respondents

AMPO CMAQ SURVEY RESPONDENTS – FEBRUARY 2019

State	MPO – [legend: yellow = 1 million +; green=200,000-1 million; orange= less than 200K]
Alabama	Regional Planning Commission of Greater Birmingham
Arkansas	West Memphis MPO
Arkansas	Tri-Lakes MPO
California	Metropolitan Transportation Commission (MTC)
California	Fresno COG
California	Kern Council of Governments
Colorado	Northern Front Range MPO (NFRMPO)
Delaware/Maryland	Wilmington Area Planning Council (WILMAPCO)
Georgia	Coastal Region (CORE) Metropolitan Planning Organization
Georgia	Atlanta Regional Commission (ARC)
Illinois	Springfield-Sangamon County Regional Planning Commission (SSCRPC)
Illinois	Chicago Metropolitan Agency for Planning (CMAP)
Idaho	Community Planning Association of Southwest Idaho (COMPASS)
Kentucky/OH/WVA	KY-OH-WVA Interstate Planning Commission (KYOVA)
Maine	Bangor Area Comprehensive Transportation System (BACTS)
Maryland	Baltimore Metropolitan Council (BMC)
Michigan	West Michigan Shoreline Regional Development Commission (WMSRDC)
Michigan	Grand Valley Metropolitan Council (GVMC)
Minnesota	Metropolitan Council
Missouri	East West Gateway Council of Governments (EWGCC)
New Jersey	South Jersey Transportation Planning Organization (SJTPO)
New Mexico	Mid-Region MPO Division of Mid-Region COG
New York	Dutchess County Transportation Council
New York	Capital District Transportation Committee
Nevada	Regional Transportation Commission of Washoe County
Nevada	RTC of Southern Nevada
North Carolina	Winston-Salem MPO
North Carolina	Fayetteville Area Metropolitan Planning Organization (FAMPO)
North Dakota	Bismarck Mandan Metropolitan Planning Organization (BMMPO)
Ohio	Mid-Ohio Regional Planning Commission (MORPC)
Pennsylvania/NJ	Delaware Valley Regional Planning Commission (DVRPC)
Oregon	Lane Council of Governments
South Dakota	City of Rapid City
Tennessee	Knoxville Regional TPO
Tennessee	Memphis MPO
Texas	Alamo Area MPO
Texas	Houston-Galveston Area Council
Texas	North Central Texas Council of Governments
Utah	Western Front Regional Council (WFRC)
West Virginia/Ohio	Brooke Hancock Jefferson Metropolitan Planning Commission (BHMPC)
Wisconsin	Bay Lake Regional Planning Commission
Virginia	Northern Virginia Transportation Authority
Washington D.C./MD/VA	Metro Washington Council of Governments
Washington	Southwest Washington Regional Transportation Council
Washington	Puget Sound Regional Council (PSRC)

ATTACHMENT C – Federal Apportionment of CMAQ Funds

As under MAP-21¹⁵, the FAST Act authorizes a single amount each year nationally for all apportioned highway programs combined. That amount is apportioned among the States, and then each state's apportionment is divided among the individual authorized programs (e.g. National Highway Program (NHPP), Surface Transportation Block Grant (STBG) program, Highway Safety Improvement Program (HSIP), CMAQ program, etc.).

After certain adjustments, a base apportionment is determined for each state and then divided into the various program categories as noted above. For the CMAQ program, the states are apportioned funds based on a ratio of each State's FY2009 CMAQ funds divided by that State's total FY09 federal-aid apportionments¹⁶. The FY2009 apportionment formula pre-dates MAP-21 (2012) and was based on population weighting factors for ozone and CO nonattainment and maintenance areas. The weighting factors for ozone were based upon the classification of the area (e.g. marginal, moderate, serious, etc.).

When making apportionments of CMAQ funds to states, there are three other FHWA determinations that come into play as follows. The [FY2019 Apportionment Tables](#) show the CMAQ calculations on Table 7, Parts 1-3.

- 1) State Planning & Research (SPR) set-asides: There is a required 2% set-aside of CMAQ funds for State Planning and Research activities that comes off of the top of each state's annual apportionment. [FY 2019- \$49 M nationwide];
- 2) PM2.5 set-aside: Next, there is a required set-aside of CMAQ¹⁷ funds that are to be used for projects that reduce PM in PM2.5 nonattainment or maintenance areas. For states with PM2.5 nonattainment or maintenance areas, the amount set-aside must equal 25% of each state's CMAQ apportionment attributable to population in PM2.5 nonattainment areas. There are some exceptions. For example, in low density states the PM2.5 set-aside provision does not apply. [FY 2019 - \$290.6 M in 22 states], and,
- 3) 10% Limiting Amount for Certain Safety projects: This is the amount of CMAQ funds that can be used for certain safety projects¹⁸ with no local match required (e.g., 100% federal share). These include projects that also may reduce emissions such as roundabouts, carpool/vanpool projects, traffic signalization, and others. [FY2019 -\$244.8 M nationwide].

¹⁵ 23 USC 104(b) (4), as amended by Section 1105, Pub. L. 112-141, (July 6, 2012).

¹⁶ <https://www.fhwa.dot.gov/legsregs/directives/notices/n4510831/>

¹⁷ 20 U.S.C.149 (k). Also see: <https://www.fhwa.dot.gov/fastact/factsheets/cmaqfs.cfm>.

¹⁸23 U.S.C. 120(c) 1).

ATTACHMENT D – Intrastate Allocation of CMAQ Funds -Tennessee

Tennessee - State DOT Manages CMAQ Program Funds and Project Selection Process

The Tennessee Department of Transportation (TDOT) manages the allocation of CMAQ funds and the project selection process centrally through a statewide process. This is done periodically through a TDOT-administered, competitive project selection process among eligible MPO regions (see map below). TDOT received \$38.298 million in FY2019 CMAQ including \$4.33 million in PM2.5 set-aside funding.



TDOT develops and publishes project evaluation criteria and assigns scores to each criterion with scores that vary depending on the criterion. Proposals that better address each criterion are awarded higher scores. TDOT usually does a CMAQ competition for all CMAQ funds but in 2018 TDOT conducted a “mini-competition” for PM2.5 CMAQ funds. The application package and materials can be found at: [TDOT PM2.5 Competition](#).

The process requires that project sponsors (e.g., local governments or nonprofit organizations) prepare project proposals, including air emission reduction analyses, and submit them to TDOT through an online electronic grants application portal [eGrants](#). The respective Metropolitan Planning Organization (MPO) or Transportation Planning Organization (TPO) that includes a non-attainment/maintenance county within its boundaries is typically requested to review the proposals and provide “Regional Priority” score of up to 10 points. Individual project sponsors determine the methodologies used to estimate emission reductions for prospective CMAQ projects.

TDOT reviews, evaluates and scores the proposals that are received. Based on that review, staff recommends selected projects be funded. The TDOT Commissioner reviews those recommendations and makes the final selection of projects for funding.

<https://www.tn.gov/tdot/long-range-planning-home/air-quality-planning/cmaq-map21.html>.

ATTACHMENT E – Intrastate Allocation of CMAQ Funds - Washington

Washington State - State uses pre-MAP-21 CMAQ apportionment formula

In Washington State, CMAQ funds are distributed within the State according to the distribution formula from 2012 (pre-MAP-21) which reflect weighted population in CO and ozone areas. The Puget Sound region also receives the PM.2.5 set-aside funding (\$4.29 million in FY2019). In Washington, the MPOs that have nonattainment or maintenance areas include: (Puget Sound Regional Council (PSRC), Southwest Washington Regional Transportation Council (RTC), Spokane Regional Transportation Council (SRTC), the Thurston Regional Planning Council (TRPC), and Yakima Valley Conference of Governments (YVCOG). As shown below, the 2012 population data is used to determine the percentage of CMAQ funds that goes to each MPO. Finally, the MPOs select which projects will be funded with CMAQ funds in their respective regions.

2019 Congestion Mitigation/Air Quality (CMAQ) - FINAL					
	2010 POP Total County	2012 Total	%	TOTAL	%
PSRC *	3,439,809	26,744,409	77.55%	29,160,831	80.20%
RTC	425,363	3,306,595	9.59%	3,074,897	8.46%
SRTC	471,221	3,651,548	10.59%	3,395,679	9.34%
TRPC	252,264	399,025	1.16%	371,065	1.02%
YVCOG	243,231	384,264	1.11%	357,338	0.98%
Grand Total	4,831,888	34,485,841	100.00%	36,359,810	100.00%

* PSRC amount includes approximately \$4.29 million PM 2.5 funds.

Source: Washington State Department of Transportation,
<https://www.wsdot.wa.gov/LocalPrograms/ProgramMgmt/CMAQ.htm>.

ATTACHMENT F - Intrastate Allocation of CMAQ Funds - Michigan

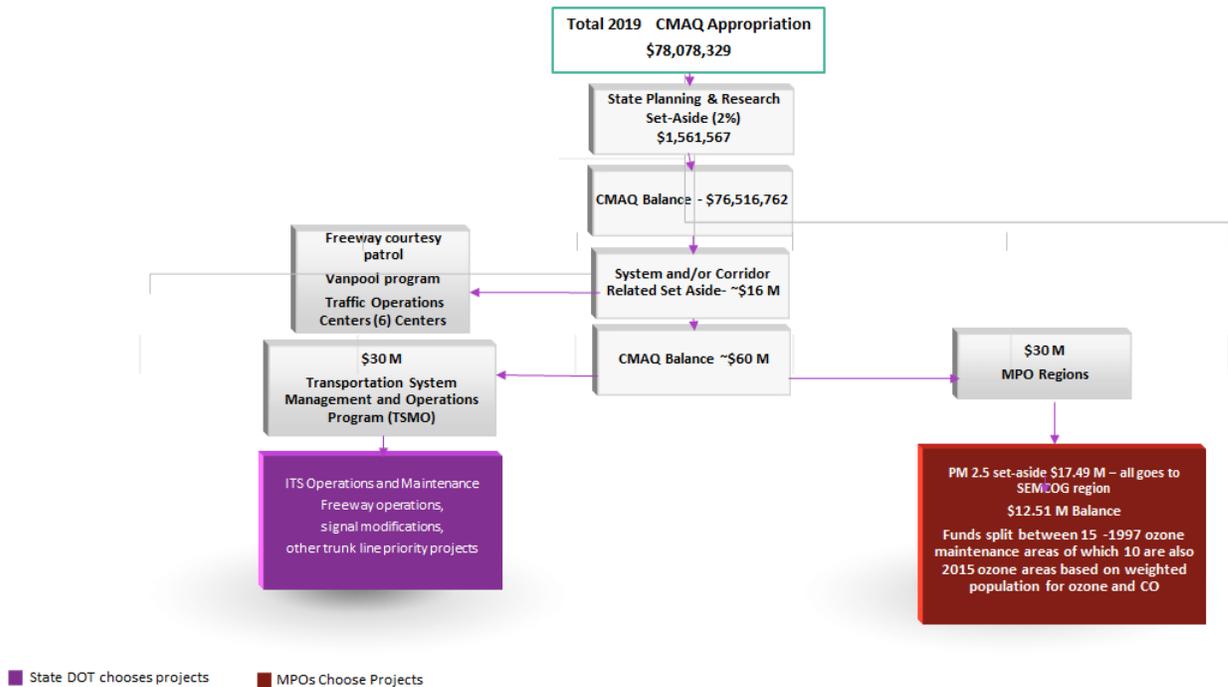
Michigan DOT – Hybrid Approach

In Michigan, the State DOT reserves funding off the top of the CMAQ program for van pool programs, traffic operations centers (6 statewide), and freeway courtesy patrol. In FY 2019 this amount was approximately \$16 million or about 21% of the 2019 CMAQ apportionment of \$78,078,329.

The balance of the CMAQ funds (~\$60 million) are split evenly between the MPOs in nonattainment and maintenance areas and the state DOT. Of the \$30 million that goes to the MPOs, \$17,490 million are PM2.5 set-aside funds which all go to the Detroit [Southeast Michigan Council of Governments (SEMCOG)] region, the only PM2.5 nonattainment area. The balance of the \$30 million is split between the 25 counties that were 1997 ozone areas (10 of those areas are also 2015 ozone nonattainment areas). Beginning in FY2020, the 1997 ozone areas will receive half of the allocation they formerly received in order that the ten 2015 ozone areas have more funding to address their air quality issues. The MPOs choose which projects will be funded in their regions, so long as they meet CMAQ eligibility requirements.

The state DOT spends its portion (~\$30 million) on state priorities. Specifically, funds are directed to the Transportation System Management and Operations program (TSMO). This program includes ITS projects, freeway operations, signal modifications, and other trunk line projects identified as priorities by MDOT. All projects must be eligible for CMAQ funds; the State does not transfer CMAQ funds to other federal-aid programs. Figure 1 below shows how the funds are split in FY2019.

MICHIGAN CMAQ FUNDING SPLITS – FY 2019



Source: Michigan DOT.

ATTACHMENT G - CMAQ Project Selection Process -Chicago

Chicago Metropolitan Agency for Planning (CMAP)



The Chicago Metropolitan Agency for Planning (CMAP) is the metropolitan planning organization for the seven counties of northeastern Illinois. CMAP recently conducted a combined project selection process for FFY 2020-2024 CMAQ projects and FFY 2020-2022 Transportation Alternative Program (TAP) projects. For both TAP and CMAQ funds, the project evaluation and selection process is comprehensive, well organized and includes working with regional partners. For CMAQ funds, the process results in a well-vetted set of recommended projects with solid justification and reliable emissions reduction benefits.

Cost effectiveness is the primary criteria for selection of CMAQ-funded projects. Cost effectiveness is measured as annualized dollar per kilogram reduced of VOC, NOx and/or PM2.5. The emissions analysis is done on all project proposals by CMAQ staff to ensure consistency in use of assumptions and emissions estimating methodology. The CMAP region receives an annual allocation of PM2.5 funds (\$2.0 M -2019). As part of the project selection process, CMAP has a specific project category for direct diesel emission reduction projects.

In addition to cost effectiveness, CMAP has a robust project evaluation process that includes scoring on a number of other criterion. This includes a quantification of transportation impact and regional priority and a composite priority index score that is the sum of air quality, transportation impact, and regional priority scores. The projects that are recommended under the recent call for projects and their scores is at [CMAQ Recommended Projects](#). Also see, Source: [CMAP CMAQ Evaluation Framework](#).

There are four primary CMAQ project types; highway, transit, bicycle, and direct emission reduction projects. For each category, there are additional criteria and weights assigned with a total possible score of 30 points. Table 1 below shows the criteria and weights for the four primary project types. Projects get extra points if they address certain regional priorities as shown in the regional transportation plan, [ON TO 2050](#). For the most recent call for projects these priorities were: 1) is the proposed project a component of a regionally significant project in ON TO 2050?, 2) is the project supportive of inclusive growth principles that increase access to opportunities for low income residents and people of color?, and 3) are zoning and urban design requirements in the area around proposed transit projects supportive of transit?

Project Type	Criteria and Weights (points)		
Highway	Reliability - 15	Safety - 5	Corridor/Transit Improvement – 10
Transit	Ridership – 15	Reliability (transit service) or asset condition (transit facilities) - 15	
Bicycle	Safety & attractiveness – 10	Transit accessibility -10	Facility connectivity -10
Direct Emissions Reduction	Benefits sensitive population – 20	Annual health benefits - 5	Improves public fleets - 5

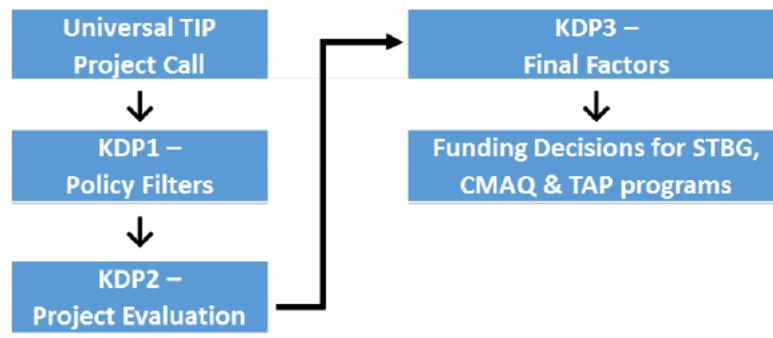


Atlanta Regional Commission

The Atlanta Regional Commission (ARC) has migrated the Transportation Improvement Program (TIP) solicitation process to a [Key Decision Point Framework](#). ARC has used the KDP framework in the development of the Regional Transportation Plan and just recently, in the development of the TIP. The KDP process developed by ARC is performance and data-driven and incorporates into the TIP and RTP a rigorous and comprehensive project selection process that seeks clearly defined performance outcomes.

The KDP process has four key steps. See Figure 01. First, ARC initiates a call for projects. This is a universal call and does not focus on any single funding source, including CMAQ. ARC staff then applies policy filters to proposed projects and removes projects that do not meet the requirements of one of the three categories of filters: 1) transit capacity, 2) roadway capacity, and 3) general filters for infrastructure expansion or maintenance.

Figure 01 – KDP Flowchart



Source: The ARC TIP Project Evaluation Framework

The second step of this process is to evaluate and score projects using project evaluation criteria developed in consultation with ARC regional partners through the TIP Prioritization Task Force. There are eight key project types and twelve different performance criteria. For each criteria there are specific metrics used for scoring. Air Quality & Climate Change is one of the twelve criteria and largely focuses on project emissions (NO_x, VOC, PM_{2.5}, and CO₂) though it changes based on project type. [See Table 02. A Values with a check mark indicate that performance measures and metrics were identified for that combination of project type and criterion.]

The third step in KDP process allows for the fact that some project factors cannot be accounted for in a purely technical exercise. This step allows for such factors to be considered. The non-performance driven factors considered by ARC and stakeholders are: 1) project sponsor priority, 2) benefit-cost or cost-effectiveness, 3) regional equity, and 4) deliverability. By considering these factors, ARC ensures that the TIP can be delivered in a timely manner and that funds are being used effectively.

The fourth step in the KDP process is when project selection decisions are made and ARC staff assigns funding to projects based on performance factors and project eligibility requirements (e.g. CMAQ). One

important exception to the KDP process is that it is not used for Georgia DOT projects so long as they use GDOT’s share of federal funds. Since ARC is now going to have to demonstrate how the TIP is going to help achieve performance targets, GDOT projects will require a technical analysis. ARC hopes to migrate the GDOT projects into this process in the future. Any GDOT projects that want to use ARC’s share of federal funding must pass through the KDP process.

Table O2 – TIP Project Types and Key Criteria

Atlanta Region’s Plan Vision	Performance Criteria	Project Types							
		Bicycle and Pedestrian	Trail	Roadway Asset Management & Resiliency	Roadway Expansion	Roadway Transportation Systems Management & Operations	Transit Expansion	Transit Asset Management and System Upgrades	Misc. Emissions Related Projects
World Class Infrastructure	Mobility & Congestion	✓	✓	✓	✓	✓	✓	✓	
	Reliability				✓	✓	✓		
	Network Connectivity	✓	✓	✓	✓	✓	✓		
	Multimodalism	✓	✓	✓	✓	✓	✓		
	Asset Management & Resiliency	✓ ⁴	✓ ⁴	✓	✓ ⁴	✓ ⁴	✓ ⁴	✓	
Healthy Livable Communities	Safety	✓	✓	✓	✓	✓	✓	✓	
	Air Quality & Climate Change	✓	✓		✓	✓	✓	✓ ⁵	✓
	Cultural & Environmental Resources	✓	✓	✓	✓	✓	✓	✓	
	Social Equity	✓	✓	✓	✓	✓	✓	✓	
	Land Use Compatibility	✓	✓				✓		
Competitive Economy	Goods Movement			✓	✓	✓			
	Employment Accessibility	✓	✓	✓	✓	✓	✓	✓	

Source: ARC TIP Project Evaluation Framework, Aileen Daney

ATTACHMENT I - Target Setting - Performance Measures -Boston



Boston Region Metropolitan Planning Organization

The Boston region includes the City of Waltham, which is designated as a carbon monoxide maintenance area, as of FHWA’s October 2017 applicability determination¹⁹ for CMAQ on-road mobile source emission measures. In addition, the Boston region’s population exceeds 1 million and includes part of the National Highway System (NHS) network in the Boston urbanized area (UZA), which includes portions of neighboring MPOs in Massachusetts, New Hampshire, and Rhode Island (see map below). For these reasons, in 2018 the Boston Region MPO needed to meet the FHWA performance-based planning requirements for the on-road mobile source emissions reduction measure. The MPO also needed to coordinate with the Massachusetts Department of Transportation (MassDOT), the New Hampshire Department of Transportation (NH DOT), and the Northern Middlesex Council of Governments to establish targets for CMAQ traffic congestion measures for the Boston UZA and to meet related performance requirements. The measures and the applicable geographic area are shown in Table 1 below.

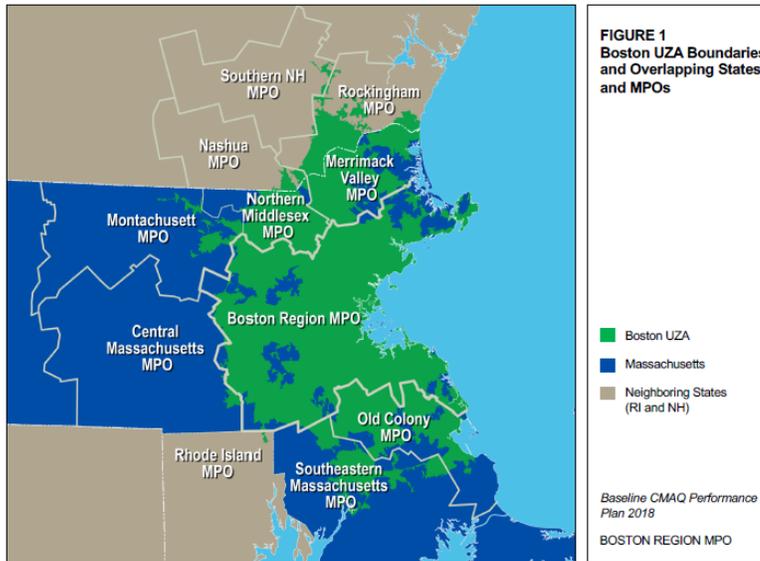


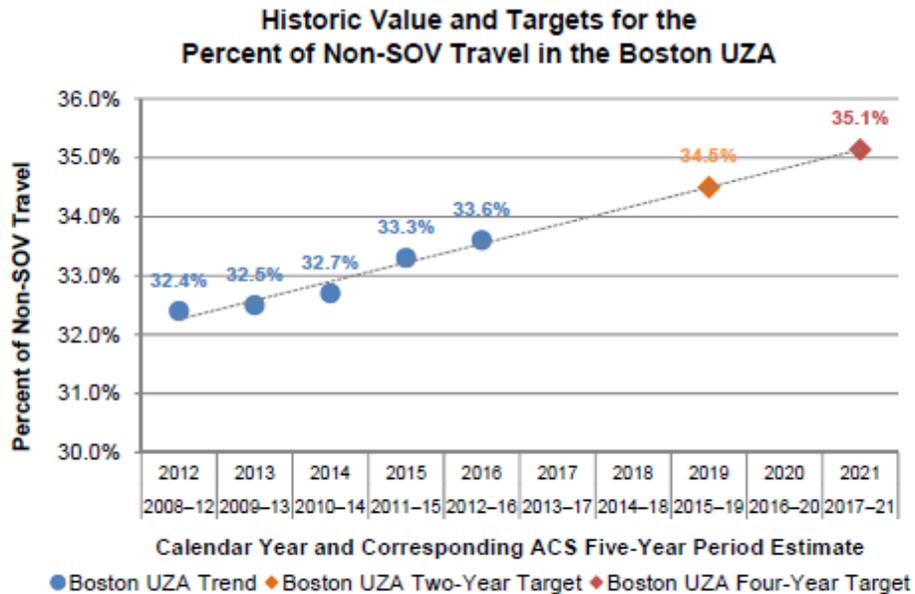
Table 1. Performance measures and applicable geographic area	
Performance Measure	Applicable Geographic Area
Traffic congestion: Percent of non-SOV travel	Boston Urbanized Area (see map)
Traffic congestion: Annual hours of peak hour excessive delay (PHED) per capita for travel on the NHS system	Boston Urbanized Area (see map)
On-Road Mobile Source Emissions: Total emissions reduction for applicable pollutants and precursors for CMAQ-funded projects in designated nonattainment and maintenance areas	Air Quality nonattainment or maintenance areas in the Boston Region MPO area (Waltham is a CO maintenance area, there were no other non- attainment or maintenance areas in the region as of October 2017)

¹⁹ https://www.fhwa.dot.gov/environment/air_quality/cmaq/measures/cmaq_applicability/index.htm

Target Setting Process

Percent of Non-SOV Travel in the Boston UZA

Targets for the percent of Non-SOV travel measure were established using the American Community Survey (ACS) five-year period estimates of the percent of workers age 16 and older who commuted to work using a mode other than driving alone. The ACS five-year period estimates are constructed as rolling annual averages. MassDOT calculated a linear trend line using ACS 5-year values for the UZA and used that trend line to project values as of the end of 2019 and the end of 2021. MassDOT and NHDOT selected these projected values as the two-year and four-year Boston UZA targets for this measure. The chart below shows the historic values and targets for the percent of non-SOV travel for the Boston UZA.



ACS = US American Community Survey. SOV = single-occupancy vehicle. UZA = urbanized area.
Sources: US Census Bureau, 2012-16 American Community Survey Five-Year Estimates; MassDOT; and NH DOT.

Annual Hours of PHED per capita

The annual hours of excessive peak hours of delay (PHED) per capita measure estimates the expected delay experienced by a UZA's population from travel on the National Highway System (NHS) during peak periods. MassDOT coordinated with NH DOT to develop a baseline estimate for this measure using the data elements outlined in Table 2 below.

PHED Measure Data Element	Source for the Boston UZA
UZA Boundary	US Decennial Census
UZE Population	Population estimate for MA and NJ portions of UZA were based on 2012-16 ACS Block group data and expected Boston MSA population growth from 2016 to 2017.
Reporting Segments	2017 National Performance Management Research Data Set (NPMRDS)
Travel times in 15-minute intervals	2017 NPMRDS
Hourly Traffic Volumes	Average Annual Daily Traffic (AADT) reported to the Highway Performance Monitoring System (HPMS) by MA and NH DOT
Annual Vehicle Classification for Buses, Trucks, and Cars	AADT, AADT single unit, and AADT combination unit classification data as reported to the HPMS
Annual Vehicle Occupancy for Cars, Buses, and Trucks	Data provided by FHWA in <i>Average Vehicle Occupancy Factors for Computing Travel Time Reliability Measures and Total Peak Hour Excessive Delay Metrics</i> , April 2018

To understand baseline performance and set targets for this measure, MassDOT and NH DOT worked with analysts at Cambridge Systematics to calculate annual hours of PHED per capita for travel on the NHS in their respective portions of the Boston UZA. In 2018, MassDOT and NH DOT elected to set both a two-year target and a four-year target equal to the 2017 baseline value—18.3 annual hours of PHED per capita—and established these targets for the UZA. Table 3 shows the Boston UZA targets for the two and-four year period.

CMAQ Traffic Congestion Performance Measure	Baseline Data	Baseline Value (Calendar Year [CY] 2017)	Two-Year Target (CYs2018-2019)	Four-Year Target (CYs 2018-2021)
Annual hours of PHED per capita	Data sources described in Table 2	18.3	18.3	18.3

On-road emission reduction performance measure

The Boston Region MPO and MassDOT did not program any CMAQ-funded projects in the Waltham carbon monoxide (CO) maintenance area in the TIP and STIP between FFYs 2014 and 2017. Therefore, the baseline amount of CO reduced by CMAQ-funded projects in this maintenance area during this period is zero kilograms per day. Further, since the FFYs 2018-2022 and the FFYs 2019-2023 TIPs do not include any CMAQ-funded projects in Waltham, the two-year and four-year CO target is zero kilograms per day. Table 4 shows the Boston Region MPO’s CMAQ on-road mobile source emissions reduction targets. Additional details are available at [Boston Performance Plan](#).

Performance Measure	Baseline years and data	Baseline Value	Two-Year Target (FFYs 2018-2019)	Four-Year Target (FFYs 2018-2021)
Daily kilograms of CO emissions reduction from CMAQ projects in City of Waltham maintenance area	FFYs 2014-2017 data on obligated projects with CMAQ funding from FHWA CMAQ Public Access Database	0	0	0