

Port Involvement in Transportation and Air Quality Planning
(TIP and SIP Development)

White Paper #4

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This white paper is one of a series written for the U.S. EPA, Sector Strategies Program, in support of its partnership with the American Association of Port Authorities (AAPA). AAPA's Harbors, Navigation, and Environment Committee has expressed a desire to work collaboratively with EPA to address the issues discussed in this paper. The purpose of this white paper is to clarify current practice and concerns and to propose recommendations for follow-on activities that will support improved environmental performance.

1. Introduction

Port authorities have suggested that they could benefit in a number of ways from greater involvement in the transportation planning and air quality planning processes. Through greater involvement in the development of the State Implementation Plan (SIP), for example, ports could potentially avoid the need for a time-consuming general conformity analysis. This is because projects for which emissions are already included in an EPA-approved SIP are not required to be evaluated for general conformity purposes. Greater involvement in SIP development will also help to make ports more aware of emission reduction regulations that may affect their operations. Ports can also potentially benefit from greater involvement in the development of a metropolitan area's long-range transportation plan (LRTP) and Transportation Improvement Program (TIP). This involvement can help to ensure that surface transportation investments are coordinated with port expansion plans and allow for port growth. Involvement in transportation planning can also help ports secure funding for port-related projects that could reduce emissions through new or existing transportation funding programs, such as the federal Congestion Mitigation and Air Quality Improvement (CMAQ) Program.

This paper explores the potential for greater port involvement in transportation and air quality planning, and the implications for ports in terms of improving environmental performance and meeting air quality mandates. In the process, the paper provides a basic primer on the SIP development process, the transportation planning process, transportation conformity, and the CMAQ Program.

2. Review of the SIP Development Process

Background on the SIP

A SIP is the federally approved and enforceable plan by which each state identifies how it will attain and/or maintain the National Ambient Air Quality Standards (NAAQS) described in Section 109 of the Clean Air Act (CAA) and 40 Code of Federal Regulations (CFR) 50.4 through 50.12. A SIP functions like a state's blueprint for clean air. Among other things, it includes an inventory of emissions sources, information on the air quality monitoring network, an air quality analysis, projections of future emissions and air quality, control measures adopted by the state to meet air quality standards, and enforcement mechanisms.

The contents of a typical SIP fall into four categories:

- (1) State-adopted control measures – These consist of either rules/regulations or source-specific requirements (e.g., orders and consent decrees), and describe how emissions will be reduced through these measures.
- (2) State-submitted comprehensive air quality plans – Air quality plans demonstrate how the state regulatory and source-specific controls, in conjunction with federal programs, will bring and/or keep air quality in compliance with federal air quality standards. Plans focus on individual nonattainment and maintenance areas, and include attainment plans, maintenance plans, rate of progress plans, and transportation control plans.

- (3) State-submitted “non-regulatory” requirements – These include emission inventories, small business compliance assistance programs, statutes demonstrating legal authority, and monitoring networks.
- (4) Additional requirements promulgated by EPA (in the absence of a commensurate state provision) to satisfy CAA requirements.

SIP requirements applicable to all areas are provided in section 110 of the CAA, and additional requirements applicable to nonattainment areas are found in Part D of Title I of the CAA. Although the SIP is submitted by the state, given the focus on meeting the NAAQS, the SIP includes documents (i.e., air quality plans) that focus on individual EPA-designated nonattainment and maintenance areas. The SIP is a living document that can be revised by the state with EPA approval as necessary to address the unique air pollution problems in the state. Therefore, SIP revisions are undertaken from time to time, as new or revised air quality regulations and air quality plans are developed.

The SIP Development Process

A SIP is developed through a public process. The process of developing a SIP starts when the state develops a draft SIP that contains control measures and strategies, proposes it in a public process, and formally adopts it, and submits it to EPA by the Governor’s designee. Each SIP revision submitted by the state must undergo reasonable notice and public hearing at the state level, and SIPs submitted to EPA to attain or maintain the NAAQS must include enforceable emission limitations and other control measures, schedules, and timetables for compliance.

EPA must take formal rulemaking action to approve or disapprove a SIP. If a SIP meets the CAA requirements, EPA will approve the SIP. EPA’s notice of approval is published in the Federal Register and the approval is then codified in the Code of Federal Regulations (Title 40, Part 52). Once EPA approves a SIP, it is enforceable by EPA and citizens in federal district court.

As noted above, from time to time a state may choose to revise its SIP or EPA may require a state to revise its SIP. EPA is required to take rulemaking action on SIP revisions as well as SIPs.

3. The Role of Ports in SIP Development

Port emissions are generated by marine vessels and by land-based sources at ports. Marine emissions come primarily from diesel engines operating on ocean going vessels, tugs and tows, dredges, and other vessels operating within a port area. Land-based emission sources include ground equipment such as yard tractors, cranes, container handlers, and forklifts as well as heavy-duty trucks and locomotives operating within a port area. For SIP emission inventory purposes, typically only marine vessel emissions are explicitly identified and estimated. Land-based port emission sources are usually combined with other land-based non-road sources of similar type throughout the region for SIP purposes.

Based on a review of SIPs from a sample of seven regions with port facilities, it appears that many ports have not played a significant role in developing baseline or projected emissions included in a SIP.¹ The Port of Houston and the Ports of Los Angeles and Long Beach are exceptions in that they played a significant role in developing marine emissions estimates and coordinated closely with state air quality staff. The SIP document covering the Houston-Galveston Area reports extensive involvement of the Port

¹ SIPs were reviewed for the regions of Baltimore, Houston, Philadelphia, Pittsburgh, Los Angeles/South Coast, New York, and San Francisco.

of Houston Authority in the analysis of marine sources.² The Port of Houston Authority worked closely with Texas Commission on Environmental Quality's emissions inventory staff to perform a bottom-up study that inventoried the types and numbers of vessels traversing the various shipping lanes within the Galveston Bay system and in the segment of Intracoastal Waterway within the Houston-Galveston nonattainment area.³ The Port used its own contractor to apply EPA-approved emission factors to the activity data to provide emissions estimates along each segment of the waterway system. Similarly, the Ports of Los Angeles and Long Beach were closely involved in development of a 1999 emission inventory that was used in the Los Angeles area SIP.

In most other nonattainment areas, however, port involvement in development of the SIP emissions estimates has been minimal. For example, in Philadelphia, Pittsburgh, and Erie, the Pennsylvania Department of Environmental Quality (DEQ) developed estimates of emissions from ship traffic at ports using methodologies outlined by EPA⁴ and trip data primarily drawn from published sources, including the Waterborne Commerce Statistics of the Army Corps of Engineers.⁵ In Philadelphia, average trip times were estimated by using information obtained from telephone calls to tugboat operators in the Port of Philadelphia and equations provided in published sources. Direct involvement of the ports appears to be minimal or nonexistent in these cases.

Some SIP documents include control measures aimed at marine sources, although it is not clear to what extent the ports themselves were involved in developing these measures. For example, in the 1999 San Francisco Bay Area Attainment Plan for the 1-Hour National Ozone Standard, one of the adopted control measures relates to "Marine Vessel Loading Terminals," which is estimated to reduce emissions of volatile organic compounds (VOCs) by 0.3 tons per day.

Despite limited involvement of ports in the SIP development process, involvement in the SIP planning process could be important for ports where improvement projects are likely to result in emissions increases that exceed *de minimis* emissions levels. Under the CAA's general conformity regulations, the federal agency proposing the action must: 1) estimate all emissions resulting from that action; 2) compare the emissions that would occur with the action to those that would occur without it; and 3) make a determination whether the resulting emissions "conform" to the SIP.⁶ If there is a net increase in emissions due to the action, the federal agency must find that the increase is below *de minimis* levels. If they are not, the agency must find that emissions are consistent with the emissions projections in the applicable SIP or fully offset by enforceable measures. Therefore, ports would be well advised to work with their appropriate state air quality agency to ensure that emissions projections in the SIP take into account projected emissions increases associated with major port facility expansions.

It is unlikely that finite emissions increases due to construction projects at ports would be incorporated into a SIP (although there are some exceptions). However, in terms of longer-lasting emissions increases associated with port capacity expansion projects or just normal port growth (such as emissions associated with increased on-going ship activity and equipment use), it would generally be beneficial to include

² *Complete Attainment Demonstration SIP for the Houston/Galveston Ozone Nonattainment Area*, Texas Commission on Environmental Quality, September 2003.

³ See White Paper #3 for a discussion of the emission inventory development process at ports.

⁴ Emissions from ship traffic in the Port of Philadelphia were estimated by using primarily the methodology outlined in: ARCADIS, *Commercial Marine Activity for Deep Sea Ports in the United States*, EPA420-R-99-020, September 1999. For the Port of Pittsburgh and the Port of Erie, emissions were estimated using the methodology outlined in: ARCADIS, *Commercial Marine Activity for Great Lake and Inland River Ports in the United States*, EPA420-R-99-019, September 1999.

⁵ Phone conversations with and e-mail from Chris Trostle and Arlene Schulman, Pennsylvania Department of Environmental Quality, December 9, 2003.

⁶ See White Paper #1 for a discussion of general conformity issues at ports.

these increases in the SIP. Through the SIP development process, emissions reductions required to meet attainment are identified, and tradeoffs can be made between emissions reductions from various sources, including non-road mobile sources, on-road mobile sources, and stationary and area sources. To the extent that the SIP takes into account projected emissions increases, this will ensure that the port-related emissions increases are either offset by other sources or through measures targeted at port-related sources.

Advance planning by incorporating projected long-term increases in port-related emissions can help to avoid a general conformity problem that could ultimately delay a port improvement project. When a project results in emissions that exceed *de minimis* emissions thresholds, the general conformity process requires that emissions created by a project be fully offset in the period of time in which they are created. This means that once a project (that is not already included in a SIP) exceeds *de minimis* limits for emissions, project emissions must be offset to zero, not merely to *de minimis* levels.⁷ Although the state would likely prefer that finite, short-term emissions increases due to construction activity be mitigated by the project sponsor rather than incorporated directly into the SIP, eliminating longer-term net emissions increases associated with a major port expansion could be very challenging for a port to address independently. Incorporating the projected emissions increases into the SIP provides more flexibility, since the state could offset emissions increases by control measures targeted at the sector(s) with the best potential for cost-effective emissions reductions.

Participation in the air quality planning process also can yield benefits for regional air quality. When port authorities are not sufficiently involved in the air quality planning process, port-related emissions are more likely to be miscalculated. This in turn can affect a region's overall air quality attainment, particularly if a region is having difficulty achieving emissions reductions in other sectors (such as meeting transportation conformity for on-road mobile sources). It is also important that ports be involved early on when the air quality agency is developing potential control measures, since some of these measures may affect port operations. Finally, ports are likely to have greater appreciation for the need for emission reduction measures in the region if they are part of the SIP development process, and may even be able to offer voluntary reduction measures.

Port involvement in air quality planning will likely become even more important when states are required to meet the new EPA fine-particulate (PM-2.5) air quality standards. There are several areas with ports that will likely be designated as nonattainment for particulates for the first time. This new air quality designation may result in greater focus on accurate determinations of port particulate matter emissions and the effect of voluntary and other measures to reduce port emissions.

4. Potential for Port Involvement in Transportation Conformity

Background on Transportation Conformity

Some ports have expressed interest in including their projects in the regional transportation conformity determination as a way to avoid a general conformity determination. In order to understand the potential for this, it is first important to understand the background on both transportation conformity and general conformity.

Section 176(c) of the Clean Air Act prohibits federal entities from taking actions in nonattainment or maintenance areas that do not conform to the SIP for the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). The SIP explains how the state intends to bring its air quality into attainment, or if it is not in violation, how it intends to maintain those standards. It includes a budget

⁷ EPA Office of Air Quality Planning and Standards "General Conformity Guidance: Questions and Answers," July 13, 1994, p. 12. Available online at http://www.epa.gov/ttn/oarpg/conform/gcgqa_71394.pdf.

for each of the major sources of emissions. The purpose of conformity is to ensure that federal activities 1) do not interfere with the budgets in the SIPs; 2) do not cause or contribute to new violations of the NAAQS; and 3) do not impede the ability to attain or maintain the NAAQS.

In November 1993, EPA promulgated two sets of regulations to implement section 176(c):

- **The Transportation Conformity Regulations**, which establish the criteria and procedures for determining that transportation plans, programs, and projects funded under title 23 U.S.C. or the Federal Transit Act conform with the SIP. The transportation conformity regulations are codified in 40 CFR 93, in Subpart A.⁸
- **The General Conformity Regulations**, which ensure that other federal actions also conform to the SIPs, and are applicable to all other federal actions not covered under Transportation Conformity. The General Conformity regulations are codified in 40 CFR 93, Subpart B.⁹ All federal actions are covered unless otherwise exempt (such as actions covered by transportation conformity, exempt actions listed in the rule, and cases where the action does not create emissions above the *de minimis* threshold levels specified by EPA regulations in 40 CFR 93.153(b)). This includes port projects that receive federal funding as well as projects that involve a permit from the Army Corps of Engineers (Corps) for dredging, wetland fill, or construction in navigable waters.¹⁰

The language in the regulations makes clear that the intent of the transportation conformity process is to apply to highway and transit projects. The federal code discussing transportation conformity process refers to Title 23 U.S.C., which addresses highway projects and planning, the Federal Transit Act, and 49 CFR part 613, which deals with transit projects. It does not address other types of transportation projects, such as marine ports, rail freight facilities, and airports.

According to 40 CFR, Sec. 93.102, a transportation conformity analysis is required for:

- (i) The adoption, acceptance, approval or support of transportation plans and transportation plan amendments developed pursuant to 23 CFR part 450 or 49 CFR part 613 by a metropolitan planning organization (MPO) or state department of transportation (DOT);
- (ii) The adoption, acceptance, approval or support of TIPs and TIP amendments developed pursuant to 23 CFR part 450 or 49 CFR part 613 by an MPO or DOT; and
- (iii) The approval, funding, or implementation of Federal Highway Administration (FHWA) or Federal Transit Administration (FTA) projects.

Although the law does not explicitly rule out bringing other types of transportation projects into the transportation conformity analysis, the intent of the law to address only highway and transit projects is clear and supported by federal guidance documents.

According to a guide on general conformity published by EPA,¹¹ in response to a question about whether projects funded by the National Recreational Trails Funding Program (NRTFP), under Title 23, are subject to the transportation conformity, EPA responded that:

⁸Subpart A is titled “Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Laws.”

⁹Subpart B is titled, “Determining Conformity of General Federal Actions to State or Federal Implementation Plans.”

¹⁰ See White Paper #1 for a discussion of general conformity issues at ports.

¹¹ EPA Office of Air Quality Planning and Standards “New General Conformity Q&As” October 19, 1994. Available online at http://www.epa.gov/ttn/oarpg/conform/gcgqa_101994.pdf

“EPA intended the transportation conformity rule to apply only to projects that involve highway and transit vehicles, not to the types of projects funded by the NRTFP such as, recreational trails for bicycle, pedestrian and motorized vehicle use. Since the general conformity rule applies to federal actions other than those covered by the transportation conformity rule, it is EPA’s opinion the NRTFP projects are subject to general conformity requirements. (letter from Phillip Lorang, OMS to Cindy Burbank, May 31, 1994).”

EPA and DOT have also issued joint guidance on general conformity for airports, providing more detailed information on how the emissions analysis should be conducted for these sources, which are transportation facilities but not covered under the scope of the transportation conformity requirements.¹² Therefore, under existing law, projects undertaken by ports are only subject to general conformity, and cannot be directly addressed under the transportation conformity rule. (Note that transportation plans, programs, and projects developed by an MPO or state DOT could include improvements to roadways serving ports, and these would be subject to transportation conformity.)

EPA does allow emissions reductions from non-road sources to be used to help meet SIP emissions reduction obligations found in rate-of-progress and attainment demonstrations, and emission reductions from non-road source can be used to help meet transportation conformity requirements through emissions trading under 40 CFR93.124(c) if the SIP establishes appropriate mechanisms for such trades. EPA’s Economic Incentive Program (EIP) is designed to provide flexibility in meeting SIP requirements in the most cost-effective manner by allowing trading of emissions reductions among sectors. Under this program, an MPO could use emissions reductions generated by sources participating in a trading EIP to meet transportation conformity requirements (i.e., use emissions reductions to meet the on-road mobile sources budget).¹³ It would first require a state to develop an emissions trading rule for such trades, and as far as EPA is aware, no states have implemented this type of rule for on-road mobile sources.¹⁴ Some nonattainment areas, however, are interested in considering ways in which emissions reductions from ports and other freight facilities could be used to meet transportation conformity requirements.¹⁵ Ports should therefore be aware of transportation conformity issues and the potential role of non-road sources in meeting transportation conformity requirements. Note that by taking credit for a reduction in non-road emissions at ports in order to demonstrate transportation conformity, those emission reductions could not be used in an effort to demonstrate general conformity.

Technical Constraints and Other Issues

The transportation conformity rule would need to be amended in order to allow port-related emissions (from marine sources and off-road port equipment) to be incorporated into the transportation conformity process. Incorporating off-road emissions sources into the transportation conformity process would be a

¹² Federal Aviation Administration and US Environmental Protection Agency, “General Conformity Guidance for Airports: Questions and Answers”, September 25, 2002. Available online at http://www.epa.gov/ttn/oarpg/conform/airport_qa.pdf.

¹³ See U.S. Environmental Protection Agency, *Economic Incentive Programs: Improving Air Quality With Economic Incentive Programs: Final Guidance*. EPA-452/R-01-001. January 2001. Section 16.10.

¹⁴ In some cases, states have revised their SIPs to increase the emissions budget for on-road mobile sources by reducing the budget for other sources where reductions have been identified. Personal communication with Meg Patulski, U.S. Environmental Protection Agency, Office of Transportation and Air Quality. December 15, 2003.

¹⁵ For example, Baltimore, which is a severe ozone nonattainment area and facing potential conformity problems, is considering ways to potentially meet transportation conformity requirements through reductions from non-road sources, such as port-related projects. Personal communication with Mike Koontz, Federal Highway Administration, Air Quality Team. December 11, 2003.

wide departure from the existing conformity process. Even if the regulations did allow port-related projects to avoid general conformity by incorporating them into the transportation conformity analysis, there are a variety of technical constraints and requirements that may make this undesirable from the perspective of ports and existing stakeholders in the transportation conformity process.

Most importantly, rather than simplifying the process, incorporating ports into the transportation conformity process may require more time and resources on the part of port authorities. Transportation conformity determinations must be made at least every three years, or as changes are made to plans, TIPs, or projects. Certain events, such as SIP revisions that establish or revise a transportation-related emissions budget, may also trigger new conformity determinations. On the other hand, general conformity determinations only need to be made for projects that exceed *de minimis* emissions thresholds. By incorporating ports into the transportation conformity process, port-related emissions would need to be quantified and projected on a regular and relatively frequent cycle (for each transportation conformity cycle), rather on a more infrequent basis when a major port expansion project takes place.

Secondly, the transportation conformity process involves a wide range of participants, including the MPO, DOT, and transit agencies. Adding port-related emissions (from marine sources and off-road port equipment) would only make the analysis more complex, and potentially difficult for both ports and other parties, since tradeoffs would need to be made between an even larger set of activities and emissions sources. Moreover, MPOs and DOTs may not support including port-related projects within transportation conformity because the MPO is responsible for the conformity analysis in urban areas and it will require more work for them, while giving these agencies less control over the emissions sources.

Incorporating port-related emissions into the analysis would require a revision in the SIP budget used for the transportation conformity analysis. Based on a review of individual SIPs for metropolitan areas with major port facilities, it appears that marine-related emissions are often lumped together with other non-road mobile sources. The state air quality agency may be hesitant to undertake such a change since a SIP revision is often a lengthy and complex process, and requires examining tradeoffs in the emissions budgets for all sectors.

5. Review of the Metropolitan Transportation Planning Process

Although ports cannot include their projects directly in the transportation conformity process, this does not mean that ports should not be involved in the regional transportation planning process. To the contrary, there are a number of reasons why participation in the transportation planning process is important. First, port involvement in the development of transportation planning documents can be an important mechanism to ensure that highway and transit investments support port activities. Second, port expansion projects could result in an increase in truck vehicle miles of travel (VMT), which would have important impacts within the transportation conformity process. MPOs responsible for conducting a regional emissions analysis under transportation conformity will need to be aware of and incorporate all VMT in the applicable area into the analysis. Therefore, coordination is important for solid air quality planning and so that efforts can be taken to ensure that regional emissions meet the on-road mobile sources emissions budget. Finally, involvement in transportation planning could help ports to secure funding for transportation/air quality improvement projects through the Congestion Mitigation and Air Quality Improvement (CMAQ) Program.

The treatment of ports in transportation plans varies widely, and in many cases, ports are not as actively involved in the transportation planning process as they could be. Ports and MPOs need to be aware of the potential benefits of involvement in the transportation planning process. In order to understand their potential role in the process, this section provides background on the transportation planning process in metropolitan areas. Regulatory requirements for transportation planning are codified in 23 CFR 450, with

metropolitan transportation planning addressed in Subpart C, and statewide transportation planning addressed in Subpart B.

MPO Responsibilities

Transportation planning processes are required to be organized and directed for all urbanized areas by metropolitan planning organizations (MPOs), which are designated to receive federal money that is allocated directly to regions (as opposed to money that is allocated to the states). The main responsibility of the MPO is to serve as a regional agency coordinating transportation planning and programming. Planning is the process of deciding the overall regional direction and projects, while programming involves matching available funding to specific projects.

Planning Documents: The LRTP and TIP

The MPO is required to prepare two documents: the Long-Range Transportation Plan and the Transportation Improvement Program. (The state is also required to prepare similar plans at the state level.)

Long-Range Transportation Plan (LRTP)

The LRTP is a plan that looks broadly at transportation in the region and sets goals for the future, as well as makes estimates of future infrastructure needs, the investments that should be made, and available funding to implement the plan. LRTPs are required to plan for a period of at least 20 years; some use a 25- or 30-year planning horizon. The LRTP is required to be updated every three years. The LRTP is sometimes referred to as the regional transportation plan or metropolitan transportation plan.

Transportation Improvement Program (TIP)

The TIP is a financially constrained three-year program covering the most immediate implementation priorities for transportation projects and strategies from the LRTP. While TIPs must cover a minimum three-year period of investment, the TIP must be updated at least every two years to reflect the current funding situation. While federal regulations require the TIP to include all projects receiving any federal funds, some regions include all projects in the TIP, even those being funded only with state and local funds. The TIP must be consistent with the LRTP.

Exhibit 1 provides a quick summary of the major planning documents at the metropolitan and statewide levels.

Process for Preparing the LRTP and TIP

The MPO is required to coordinate the preparation of the LRTP and TIP with a number of other entities. For the LRTP, by federal requirement, the MPO selects all projects except for federal highways and bridges (those on the National Highway System and subject to the Bridge and Interstate Maintenance Programs). Those projects are instead selected by the state in consultation with the MPO. While it is not strictly required, the MPO generally works with local jurisdictions to develop the LRTP.

In developing the long-range plan, the MPO uses a travel demand forecasting model to estimate future traffic volumes on individual roadway segments. These models typically use employment and population forecasts to predict the number of vehicle trips beginning and ending in each analysis zone (each analysis zone is typically the size of a census tract or smaller). More simplistic travel demand models treat ports just like any other employment center, so the number of truck trips “generated” at the port is based solely

on the employment in the analysis zone that contains the ports. More sophisticated models recognize the unique characteristics of ports (as well as airports and truck/rail intermodal facilities) and treat the facility as a “special generator” in the travel model. In doing so, MPOs can more accurately forecast the effects of port cargo growth on the region’s roadway system.

For the TIP, the MPO is required to work with the state and with local transit operators (who receive federal funds) in both selecting projects as well as developing funding estimates. The TIP, after being approved by the MPO and Governor, is then submitted to the state DOT for inclusion in the State Transportation Improvement Program (STIP), which is then submitted to FHWA/FTA.

In addition to coordinating with other levels of government, the MPO must provide a “reasonable opportunity” for public comments on both the LRTP and the TIP by affected agencies and organizations.

Exhibit 1: Major Metropolitan and Statewide Transportation Planning and Programming Documents

Document	Purpose	Responsible Agency	Time Frame	Updates	Coordination Required
Long-Range Transportation Plan (LRTP)	To establish a vision for the regional transportation system	MPO	Must cover at least 20 years	Every three years	Funding estimates in conjunction with state
Transportation Improvement Program (TIP)	To list all approved and funded projects within region	MPO	Must cover at least three years	Every two years	Funding estimates in conjunction with state and transit operators
State Transportation Plan	To establish a vision for the statewide transportation system	State DOT	Must cover at least 20 years	“Periodically updated as appropriate”	Cooperation with MPOs, local officials in non-urbanized areas, and tribal governments
Statewide Transportation Improvement Program (STIP)	To list all approved and funded projects within state	State DOT	Must cover at least three years	Every two years	Must incorporate TIPs as adopted by MPOs and be approved by U.S. DOT

Planning Requirements

Fiscal Constraint Requirements

The LRTPs and TIPs must be fiscally constrained; they are not just a “wish list” of projects. The level of constraint differs for the two documents given their long-term versus short-term nature. The LRTP must include a financial section that estimates how much funding will be needed over the life of the plan and how the MPO can reasonably expect to fund the projects included in the plan over that timeframe. Determining the amount of available funding is a cooperative effort between the MPO, state DOT, and transit operators.

As a short-term document, the TIP has more stringent requirements. It must identify which combination of funding sources (federal, state, local) will be used for each project and must show that enough funds

will be available for all the projects. Projects included in the first two years of the TIP must have funds available or committed.

Transportation Conformity Requirements

As described in Section 4, both the LRTP and TIP are required to “conform” to the SIP for achieving air quality standards. To be in conformity, nothing in the LRTP or TIP can cause a new violation of air quality standards, exacerbate existing violations, or delay attainment. Determinations of conformity are based upon the most recent planning assumptions and estimates of regional emissions. The key component of transportation conformity is a regional emissions analysis that compares emissions from all on-road sources against the on-road mobile sources budget in the SIP. For certain types of projects, there are also requirements for analysis of project related emissions (hot spot analysis). No plan or TIP may be found in conformity or adopted by an MPO until a final determination has been made that emissions expected from implementation of such plans are consistent with the emissions budget in the SIP.

The MPO and U.S. DOT, through FHWA and FTA, are responsible for the transportation conformity analysis. EPA also plays a role, acting in an advisory capacity to DOT on the air quality conformity analysis. In metropolitan areas, the policy board of each MPO must formally make a conformity determination on its transportation plan and TIP prior to submitting them to the U.S. DOT for an independent review and conformity determination. Conformity determinations for projects outside of MPO boundaries are the responsibility of the U.S. DOT and the project sponsor, which usually is the state DOT.

6. Current Involvement of Ports in the Transportation Planning Process

As described in the previous section, the transportation planning process focuses on highway and transit projects, with its two primary products being the long-range transportation plan and the Transportation Improvement Program (TIP). There is no requirement that projects for other modes, such as airports, freight rail, and marine ports, be included in the long-range plan or the TIP, although they can be included for informational purposes. In light of this, it is perhaps not surprising that port authorities tend to have limited involvement in the transportation planning process, and port projects are not included in most regional long-range plans or TIPs.

For this paper, we reviewed long-range transportation plans and TIPs for 12 metropolitan areas with major port facilities.¹⁶ Most of the TIPs did not list specific port projects. However, in most cases, it appears that ports were involved to some extent in the transportation planning process, and that transportation programs often include land-side access improvements to ports. In the Seattle area, for example, the Puget Sound Regional Council’s Long-Range Transportation Plan, *Destination 2030*, does not discuss any port improvements, but discusses improvement of surface transportation access to the port. The Puget Sound Regional Council’s TIP for FY2003-2005 includes a wide range of port access projects, including rail overpasses, efforts to separate ship and ferry traffic, and numerous pedestrian/bicycle access projects around ports.

In some cases, port projects are specifically listed in the TIP for informational purposes. For example, in Corpus Christi, Texas, the TIP notes: “To be fully multi-modal, the MPO included the Regional Transportation Authority and the Port of Corpus Christi Authority in the transportation planning process.”

¹⁶ These regions are Baltimore, MD; Charleston, SC; Chicago, IL; Corpus Christi, TX; Duluth, MN; Houston, TX; New Orleans, LA; Philadelphia, PA; St. Louis, MO; Seattle, WA; Tampa, FL; and Wilmington, DE.

The draft TIP for FY 2004-2006 includes a section titled “Port Projects,” which lists one project: Construction of Ferry Terminal, Waterfront Passenger Ferry & Terminal, Port of Corpus Christi, \$1.1 million. Similarly, the New Orleans TIP for FY 2004-2006 notes that the Technical Advisory Committee consists of representatives from all modal agencies, including the port, airport, public transit, and rail interests in the region. The document lists funding for the Port of South Louisiana Master Plan Study “for information only” for FY07-09.

The Tampa, Florida area TIP (the Hillsborough County MPO TIP, FY 2003/04-2007/08) includes projects from a variety of short- and long-range transportation plans and master plans of the agencies and jurisdictions in Hillsborough County. The roadway projects come from the MPO’s 2025 Long-Range Transportation Plan, transit projects from the Hillsborough Area Regional Transit Authority’s Transit Development Plan, and port and airport improvements from the master plans and other transportation studies developed by the Tampa Port Authority and the Hillsborough County Aviation Authority. This TIP has a specific section for Tampa Port Authority projects, which includes projects totaling about \$65 million, including both port access improvements, and projects having little to do with surface transportation (e.g., Port Redwing: Seaport improvement, marine and upland improvements for intermodal cargo handling; Berth 235 and 237: Replace Tampa ship outer bulkhead; Berth 253 – Replace bulkhead). While these projects are not required to be in the TIP under the federal metropolitan planning regulations, the MPO has chosen to include all these projects to ensure a fully multi-modal and intermodal perspective on transportation in the region.

Some ports have faced challenges due to the timing of SIP, long-range plan, and TIP updates. In the Los Angeles area, for example, recent long-range plans have been completed after submission of an updated SIP, so that the growth in transportation activity included in the long-range plan does not get reflected in the SIP until the next SIP update two or three years later. Port projects and port activity growth could be more rapidly incorporated into the SIP if the long-range plan were completed just before a SIP update.

7. Funding Opportunities

In addition to ensuring that surface transportation investments are coordinated with port needs, port authorities may want to participate in the transportation planning process in order to access additional funding sources. Federal surface transportation funds have been used in some areas for projects that directly benefit ports, such as roadway grade separation at railways that serve port facilities. However, most surface transportation funds are specifically limited to highway or transit projects. One possibility for greater funding is the federal Congestion Mitigation and Air Quality Improvement (CMAQ) Program, which offers flexibility to fund certain types of port projects. This section provides background on the CMAQ program and funding eligibility, as well as several state programs that fund emission reduction strategies that can be used by ports.

Overview of the CMAQ Program

The CMAQ Program is a funding source for transportation projects that enhance air quality and ease traffic congestion. The primary goal of the CMAQ Program is to fund transportation projects that reduce emissions in air quality nonattainment and maintenance areas. The program was initially adopted under the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, and was reauthorized under the Transportation Equity Act for the 21st Century (TEA-21) of 1998. During the initial 1992-1997 CMAQ Program period, a total of \$6 billion was available for projects, and over the current six year period (1998-2003), the program was authorized to provide \$8.1 billion to state DOTs, MPOs, and transit agencies to invest in projects that reduce criteria air pollutants from transportation-related sources. The CMAQ program, as reauthorized under TEA-21 provides greater program flexibility, several new program options, and an expansion of eligible activities available for funding compared to the initial program.

The CMAQ Program is jointly administered by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA). The CMAQ funds are apportioned annually according to factors that largely reflect air quality need; the population of each area in a state that is a nonattainment or maintenance area for ozone and/or carbon monoxide is multiplied by a factor that reflects the type and severity of the air quality problem. Each state is guaranteed a minimum apportionment of at least 1/2 of 1 percent of each year's CMAQ authorized funding regardless of whether the state has any nonattainment or maintenance areas. Because CMAQ funds are intended to improve air quality, funds must be spent in nonattainment or maintenance areas if the state contains them. If the state does not contain any nonattainment or maintenance areas, the state may use its minimum apportionment for any projects in the state eligible under either the CMAQ or the Surface Transportation Program (STP). Such states are encouraged to give priority to the use of CMAQ program funds for projects that will relieve congestion or improve air quality in areas that are at risk of being designated as nonattainment.

Historically, the largest amounts of CMAQ funding have gone toward transit projects (over the first authorization period of the program, 1992 – 1997, 43 percent of funds) and traffic flow improvements (34 percent). Shared ride projects (4 percent) demand management programs (4 percent), and bicycle and pedestrian projects (3 percent), along with other projects, made up the remainder.

CMAQ Project Eligibility

The CMAQ Program is designed with flexibility in mind, but does have some specific guidelines for how the money can be used. Activities that are legislatively prohibited from receiving CMAQ funds include vehicle scrappage programs and highway capacity expansion projects. Rehabilitation and maintenance activities also may not be funded under the CMAQ program, as they help to maintain existing services and show no potential to make progress toward reducing emissions.

All projects and programs eligible for CMAQ funds must come from a conforming transportation plan and TIP, and be consistent with the conformity provisions contained in section 176(c) of the CAA and the transportation and general conformity rules. Projects need to be included in TIPs or statewide transportation improvement programs developed by MPOs or states respectively, under the metropolitan or statewide planning regulations. Projects also need to complete the National Environmental Policy Act (NEPA) requirements and meet basic eligibility requirements for funding under titles 23 and 49 of the United States Code.

These requirements restrict CMAQ funding from being used for port-related projects that are not related to transit or highway activities, such as general port improvement projects and projects designed primarily to reduce emissions from marine vessels.

However, the CMAQ provisions in title 23 of the United States Code (23 CFR Sec. 149) and the program guidance developed by FHWA provide substantial flexibility, and suggest that certain port-related projects can qualify for CMAQ funding if they are included in the TIP and meet other requirements above. The CMAQ Program Guidance (dated April 28, 1999) lists several project categories under which port-related projects could potentially qualify:

- **Transit Projects:** Improved public transit is one of the TCMs identified in section 108(f)(1)(A) of the CAA, and transit projects have historically received the largest share of CMAQ funding. Projects to build or expand passenger ferry facilities therefore could potentially be open to CMAQ funding. The general guideline for determining eligibility of transit projects is whether an increase in transit ridership can reasonably be expected to result from the project, as well as a reduction in motor vehicle emissions. Categories of transit projects that can be funded include

new transit facilities (such as a passenger ferry terminal), acquisition of new transit vehicles to expand a fleet, and operating assistance to start up new services (operating assistance is for a maximum of 3 years, after which other sources of funding must be used if the service is to be continued), and fare subsidies as part of ozone action programs.

- Intermodal Freight: CMAQ funds can be used for improved intermodal freight facilities where air quality benefits can be shown. These projects typically involve rail-truck connections, but could conceivably involve port facilities, as long as the project can demonstrate that it will reduce truck emissions. Capital improvements as well as operating assistance are eligible.
- Experimental Pilot Projects: This is the category that port-related projects are most likely to fall under. “Experimental” projects may not meet the precise eligibility criteria for federal and state funding programs, but show promise in meeting the intended public purpose of those programs in an innovative way. The FHWA and FTA have supported this approach in the past and funded some of these projects as demonstrations to determine their benefits and costs. The CMAQ provisions of TEA-21 allow experimentation provided that the project or program can reasonably be defined as a “transportation” project and that emission reductions can reasonably be expected “through reductions in vehicle miles traveled (VMT), fuel consumption or through other factors.” FHWA guidance encourages states and MPOs “to creatively address their transportation/air quality problems and to experiment with new services, innovative financing arrangements, public-private partnerships and complementary approaches that constitute comprehensive strategies to reduce emissions through transportation programs”, and will allow CMAQ program funds to be used to support a well conceived project even if the proposal may not otherwise meet the eligibility criteria of the CMAQ guidance. Proposals submitted for funding as experimental pilot projects should show promise in reducing transportation emissions in nonattainment or maintenance areas and should have the concurrence of the MPO, state transportation agency and the FHWA/FTA, and be coordinated with EPA and state/local air quality agencies. The amount obligated for experimental pilot projects should not exceed 25 percent of a state’s yearly CMAQ apportionment.

Although all projects proposed for CMAQ funding are required to submit quantitative estimates of emissions reductions, or provide a qualitative discussion when quantification is not feasible, additional analysis is required for experimental pilot projects. Recognizing that state transportation agencies will have little experience evaluating experimental projects against other project priorities, the CMAQ Program guidance requires before-and-after studies to determine the actual project impacts on the transportation network (measured in VMT or trips reduced, or other appropriate measure) and on air quality (emissions reduced) for these projects. An assessment of the project’s benefits should be forwarded to FHWA or FTA documenting the short-term impacts as well as a projection of the project's long-term benefits.

A number of port-related projects have been funded using CMAQ, although they make up a small portion of the total CMAQ funds being used. The Columbia Slough Intermodal Expansion Bridge in Portland, Oregon involves the construction of a bridge for railroads to directly access a deep-water port facility, thereby eliminating truck trips. The total project cost is \$6.1 million, including \$1 million in CMAQ funds and \$2.1 million in demonstration funds; the port of Portland is providing \$1.5 million and private railroads are providing \$1.5 million. The Red Hook Container Barge in New York City was awarded \$1.9 million in CMAQ funding, which was matched from local sources. The funds were used to purchase a barge and provide for some operating assistance to freight operations, which essentially removed 54,000 truck trips from the New York and New Jersey streets annually.

Other port projects funded include: the Container Shipping Facility and Service in Bridgeport Harbor, Connecticut and the Blythe Intermodal Yard, a railroad that serves the port terminal located on the Arkansas River, where direct intermodal exchange occurs between rail and barge. Additionally, the Port Authority of New York and New Jersey has drafted a proposed new system for distributing containers moving through the Port of New York and New Jersey by barge and rail, and CMAQ has been identified as a potential source for capital and operational funding.

Most of these projects demonstrate air quality benefits through reductions in truck traffic, which is important for transportation conformity in showing reductions in on-road mobile source emissions. As expertise improves in quantifying the emissions associated with large marine diesel engines, there may be additional opportunities to demonstrate the emissions benefits of new marine engines. However, it also may be determined that even if a tug-barge can reduce truck trips, it may emit more NO_x and particulates than the trucks would. As a result, improvements in emissions estimation methods for marine diesel sources may not necessarily improve the likelihood of funding these projects.

Ports that are interested in potentially receiving CMAQ funds will need to be involved in the transportation planning process since CMAQ-funded projects must be in an approved transportation plan and TIP. Ports will need to work with the MPO, state DOT, and potentially with transit agencies, depending on the type of project being proposed, in order to secure support for the project so that it can make its way into the transportation program. At least one port has commented that if CMAQ were more focused on congestion reduction and less on improving public transit service, ports would stand a better chance of securing CMAQ funds for projects that address truck access problems at ports.

Other Incentive Programs

Outside of the transportation planning process, port authorities may also wish to work with air quality and other agencies in their respective states to develop financial incentive programs focused on improving air quality and reducing emissions from non-road sources. The two largest and most successful programs that provide funding for projects to reduce emissions from marine vessels are in California and Texas, and could serve as a model to other states on how to develop similar programs.

The Carl Moyer Memorial Air Quality Standards Attainment Program provides funds on an incentive-basis for the incremental cost of cleaner than required engines and equipment in California. The California Air Resources Board (ARB) administers the program, and funds are distributed through local air districts. Incentives are offered in the form of grants for companies or agencies operating heavy-duty engines in California. For example, a company may be able to buy a new truck for \$100,000 to meet the state's minimum emissions standards, but a lower-emission truck costs \$125,000. The offsetting cost of \$25,000 is available through the Moyer program. All modes are eligible: on-road, off-road, marine, locomotive, and airport. The program achieves near-term reductions in NO_x emissions, which are necessary for California to meet its clean air commitments under the SIP. The program also reduces particulate matter (PM), a component of diesel exhaust the ARB recently identified as a toxic air contaminant.

The Carl Moyer program has been used in a variety of port applications, including the repower of harbor craft in San Pedro Bay (Los Angeles), a demonstration of propane powered yard tractors, and alternative fuel utility trucks at ports. Most recently, Moyer program funds have been approved to replace an old switch locomotive serving the Ports of Los Angeles and Long Beach with a new, lower emission locomotive. The Moyer program does have some restrictions. It cannot be used to fund increases in operations and maintenance costs, for example, and its use may be limited when the funded equipment would operate outside the jurisdiction of the agency receiving the funding. At the moment, the future of the Moyer program is uncertain because it relies on annual funding by the California legislature.

The Texas Emissions Reduction Plan (TERP) was established in 2001 and is based largely on the Carl Moyer program in California. TERP is administered by the Texas Commission on Environmental Quality and includes a number of voluntary financial incentive programs as well as other assistance programs to improve air quality in Texas. Programs include the following: emissions reduction incentive grants program; heavy-duty motor vehicle purchase or lease incentive program; light-duty motor vehicle purchase or lease incentive program; new technology research and development program; and energy efficiency programs. To date, the program has been focused mostly on off-road emission sources.

The California “Air Quality Investment Program” is administered by the South Coast Air Quality Management District and funds a variety of mobile source emission reduction projects, including several projects to convert marine vessel diesel engines into low-emission diesel engines. California’s “Heavy-Duty Engine Emission Reduction Incentive Program” is administered by the San Joaquin Valley Air Pollution Control District and funds off-road vehicles greater than 50 hp, including marine vessels. Funding draws on a variety of sources such as CMAQ, Carl Moyer, and the San Joaquin Emergency Clean Air program.

Other programs funding the retrofitting of diesel engines are available in California and in Massachusetts, Oregon, New York, and Washington; however, these programs are not of the same scope as the Carl Moyer or TERP programs.

There have been discussions for several years about the creation of a new federal funding program (sometimes referred to as SEA-21) that would focus on addressing transportation infrastructure needs and environmental programs at ports. Such a program is not actively being considered in the current debates over reauthorization of the federal surface transportation, but could be seriously considered in the future. Other policy analysts have advocated making the federal transportation funding bills more “mode neutral” so that funds could be spent on all modes and improvements to intermodal connections would be a higher priority.

8. Conclusion and Recommendations

Recommendation 1 – It is recommended that ports become more involved in the regional transportation planning process. Although participation in the transportation planning process will not allow ports to avoid general conformity, there are a number of reasons why ports can benefit from being involved in and aware of the transportation planning process. Most notably, involvement in transportation planning will help to ensure that surface transportation investments are coordinated with port expansion plans and allow for port growth. Secondly, port projects may result in increased truck VMT, and coordination is important for air quality planning in regard to transportation conformity. Finally, port-related projects that reduce emissions and traffic congestion could potentially be funded under the federal CMAQ Program. In order to qualify for CMAQ funding, a project must be included in an approved transportation plan and TIP. This means that ports need to take an active role in working with MPOs and state DOTs to include their relevant projects into the LRTP and TIP so that they are included in funding allocations.

Recommendation 2 – It is recommended that port authorities also become more involved in the SIP development process. Projects for which emissions are already included in an EPA-approved SIP are not required to be evaluated for general conformity purposes. Although short-term construction-related emissions are unlikely to be included in a SIP, longer-term increases in emissions from marine diesel sources and port equipment could be included in a SIP. This could allow a port to potentially avoid difficulties associated with meeting the general conformity requirements, while ensuring that the project is consistent with regional air quality goals. It is recommended that ports ensure that state and regional air quality planners (as well as transportation planners) receive a list of their future projects. Overall, the

inclusion of port authorities in the SIP development process will likely lead to more accurate emissions estimates for ports, which in turn, will lead to better overall air quality planning and may lead to better quantification of emission reductions from voluntary programs or other measures implemented at ports.

Recommendation 3 – It is recommended that EPA work with AAPA, states, and DOT to facilitate port involvement in the transportation and air quality planning processes and raise awareness of the benefits of this coordination. This could include working with AAPA, states, and DOT on training, workshops, and other activities to promote better coordination.

Recommendation 4 – A final recommendation is that EPA work with AAPA, states, and DOT to raise awareness among states of options to reduce emissions from ports, such as development of funding programs similar to the Carl Moyer Memorial program and TERP. It may also be beneficial to develop a national program that would be similar in scope to the CMAQ or Carl Moyer program but specifically geared toward ports and maritime transportation activities. It is recommended that a new or modified emission reduction incentive program allow ports to fund increases in operations and maintenance costs associated with the new equipment, rather than just the capital cost of the equipment. Another option to explore is the use of the Corps' Dredging Operations and Environmental Research (DOER) program to identify opportunities to reduce the emissions associated with dredging activities. Some ports (such as the Port of Los Angeles) have reduced emissions during port expansion projects by using electric dredges; other emission reduction options for dredges may be available.

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