



MEMORANDUM

To: CMAQ Project Selection Committee

From: Direct Emissions Reduction Focus Group

Date: June 30, 2011

Re: Recommended Package of Proposals for Consideration by the CMAQ Project Selection Committee

Background

In January of this year, the MPO Policy Committee adopted a new approach for the development of the Congestion Mitigation and Air Quality (CMAQ) Improvement Program. The new process includes a five-year program to help implement GO TO 2040, the comprehensive regional plan.

The overall goals of the CMAQ Program are to improve air quality and reduce congestion, as established in the Federal authorizing legislation. To carry out these goals, the CMAQ Project Selection Committee identified four objectives:

- **Localized Congestion Relief** – projects aimed at reducing congestion through relieving both rail and roadway bottlenecks.
- **Mode Shift** – projects geared towards shifting travel from single occupant vehicle travel to transit, non-motorized, and multiple-occupant modes.
- **Operational Improvements** – projects that reduce congestion by improving roadway, intersection, rail and transit operations.
- **Direct Emissions Reduction** – projects that reduce emissions by improving engine technology, reducing idling, using alternative fuels and similar measures that focus on the vehicle itself (e.g. diesel retrofits, GenSet technology, electric vehicles and support facilities for same).

Four program focus groups were charged with the task of conducting an initial review of proposed CMAQ projects and identifying projects that advance the regional program goals. The Direct Emissions Reduction Focus Group is one of these groups. The Direct Emissions Reduction Focus Group consists of staff from Illinois Environmental Protection Agency, the U.S. Environmental Protection Agency, City of Chicago Departments of Transportation and the Environment, the Regional Transportation Authority, Metra, Pace, CTA, private railroads, and

interested advocacy groups. Each has a unique set of experiences and knowledge of projects that address the fourth objective described above.

GO TO 2040 Action Areas

Although GO TO 2040 does not include specific goals or recommendations for improving air quality, it does contain recommendations and identifies action areas that implement the CMAQ objectives above. The following Implementation Action Areas are particularly relevant to the Focus Group and CMAQ programming:

Action Areas from GO TO 2040:
Adopt Best Practices in new technologies – Modernize the Region’s Transit System
Implement green infrastructure demonstration projects
Focus investment on maintenance and modernization
Prioritize maintenance and modernization projects when making investment decisions

While the action areas directly applicable to direct emissions reduction are limited, GO TO 2040 also addresses energy use, emissions and transportation:

GO TO 2040 Excerpts
Local governments should also make a commitment to using alternative fuels in their fleets and public works equipment. Indeed, communities could undertake a multitude of actions to “lead by example,” including the review of procurement processes to ensure the inclusion of green materials for governmental equipment (e.g., increased use of recycled materials in construction activities), a higher commitment to waste reduction and recycling, and so forth.
The conservation of energy and water is a top priority for GO TO 2040. Over the next 30 years, these resources will likely become more constrained, affecting businesses, local governments, and residents alike. By taking a proactive approach to resource conservation, the region can avoid price shocks farther down the road, while saving money in the medium term.

Based on the action areas and recommendations of GO TO 2040, the Focus Group adopted these specific goals and strategies for their focus area:

Goals

Increase the livability of the region by improving the air quality.

- Reduce diesel emissions
- Reduce VOC and NOx emissions
- Reduce greenhouse gas emissions
- Reduce petroleum consumption

Strategies

- Retrofit, repower, and replace motorized vehicles with emissions reduction or idling reduction equipment and technology.

- Focus on public works, transit (both revenue and non-revenue) and school bus fleets.
- Include fleets from construction, marine and freight industries.
- Emphasize innovation and improving fleets to state of the art, rather than life-cycle replacement with state of the practice vehicles.
- Increase the availability of alternative fueling stations and electric vehicle charging stations.
- Support freight industries to increase more fuel efficient vehicles and reduce idling.
- Demonstrate emerging technologies for both fuels and vehicles.
- Increase the general public's awareness of emissions reduction programs.

To help screen proposals for their support for GO TO 2040, primary, secondary, and complementary evaluation measures were identified:

- Primary
 - Reduced ozone precursors (NO_x and VOC)
 - Reduced Particulate Matter (PM)
- Secondary
 - Reduced Greenhouse Gases or CO₂e
 - Reduced petroleum consumption
- Complementary
 - Proximity to sensitive populations (seniors & children).
 - Number of reported asthma cases within proximity to the projects.
 - Is the project innovative or does it demonstrate a state of the art technology that directly reduces vehicle emissions?
 - Does the project help improve the overall condition of the region's public fleets?

Since the traditional CMAQ programming process addresses the primary measures, the Focus Group concentrated on the secondary and complementary measures in their review of CMAQ proposals.

In addition, several plans that support GO TO 2040 were identified. Proposals that support or are recommended in one of these plans were given additional consideration:

- State Implementation Plan and related programs, prepared by the Illinois Environmental Protection Agency
- Chicago Climate Action Plan
- Municipal sustainability plans
- Private sector sustainability plans
- Pace Strategic Plan

Proposal Review

Eighteen proposals that addressed direct emissions reductions were submitted for FY 2012 – 2016 CMAQ funding. Based on the goals and strategies, Focus Group members scored the

proposals using four evaluation measures that captured the secondary and complementary evaluation measures. The detail of these scores is given in a [separate table](#), posted to the Focus Group web page.

The average scores of each proposal are summarized in an attached table. The table is organized in descending order of overall average total score, where “total score” means the sum of the scores for the four individual evaluation criteria. As can be seen, the average total scores range from a high of 10.6 to a low of 4.4.

In addition, the average total score was compared to the average individual evaluation measure scores. A graph summarizing this analysis is attached. It indicates the following:

- Proximity to Sensitive Populations – This measure’s scores are generally consistent with the average total score.
- Asthma Rates Near Project – This measure’s scores are generally consistent with the average total score.
- Does Project Help Improve the Region’s Public Fleets? – This measure’s scores decline somewhat more rapidly than the average total score.
- Innovative or State of the Art Technology – This measure’s scores are not well-correlated with the average total score. This is because many of the lower-ranking projects involve emerging technologies such as electric vehicle charging stations, while the higher-ranking projects involve more proven technologies that have more well-defined benefits.

The Group’s discussions generated an idea for an additional, directly-programmed project to begin retrofitting or repowering “non-traditional” diesel engines, such as marine fleets, non-road construction equipment, or intermodal equipment such as cranes. The owners of these sources have expressed some interest in CMAQ funding, but are not generally knowledgeable about federal funding regulations, CMAQ application procedures, and the like. The Illinois Environmental Protection Agency agreed to develop this proposal, modeled along the lines of their existing school bus program.

Proposed Package of Projects

Based on the scoring and the additional considerations above, the Focus Group recommends the following proposals be adopted as a package to advance the recommendations of GO TO 2040:

CMAQ ID	Sponsor	Brief Description
DR13123744	Metra	Metra UP Automatic Engine Start-Stop System
DR13123720 and others	Pace	Transit Diesel Engine Retrofits – 2012 through 2016
DR13123745	Metra	Metra MD Locomotive Repowers
DR13123743	Metra	Metra BNSF Replace Main Engine Drive Generator

DR13123746	IEPA	Chicago Area Clean School Bus Initiative
DR01123614	CTA	Purchase a ZF TopoDyn Program
DR01123606	CTA	Retrofit of Electronic Engine Cooling Fan/System
OT01123607	CDOE	Chicago Area Alternative Fuel Deployment Project, Phase 2
DR13123843	IEPA	Clean Off-Road and Marine Vessel Initiative

Implementing these proposals will address the GO TO 2040 Action Areas and recommendations by:

- modernizing the transit service provider fleets (particularly the Metra, Pace and CTA projects, but also the Clean School Bus Initiative)
- implementing green technology projects (all projects)
- increasing alternative fuel use (notably CDOE’s Chicago Area Alternative Fuel Deployment project)
- conserving energy (notably the Metra and CTA projects)

These proposed projects are consistent with the strategies identified by the Direct Emissions Reduction Focus Group and will produce the best results in terms of the primary, secondary and complementary evaluation measures. The total federal funding required to implement these proposals is \$60,804,800.

The Focus Group urges the CMAQ Project Selection Committee to fully fund all the recommended proposals. Emission reduction projects have a very favorable cost/benefit ratio, especially for particulate matter, which is generally not well addressed by other types of projects that focus on shifting people out of cars or improving general traffic flow.

The lower-scoring proposals not included in the package tended to be simple vehicle replacements, or were for technologies that need further research or better coordination before implementing. The Partners for Clean Air Marketing proposal, which historically has been grouped with the “Other” proposals, did not rank well in this group of proposals since the criteria are strongly connected with emissions control equipment to reduce emissions.

Opportunities for Future Programming

While the Group was interested in electric vehicle technologies, the proposals submitted were small, scattered, and not part of a larger plan to disseminate electric vehicle technology through the region. The Group recommends that criteria to evaluate individual charging station sites and a region-wide implementation plan be developed. The Chicago Department of the Environment is already engaged in electric vehicle implementation, so their work could serve as a starting point.

More generally, vehicle technology is changing at a rapid pace. The Group recommends the CMAQ program be flexible in the future to program projects that use technology that may not exist, or be feasible, today.

In addition, no private railroads proposals were submitted in this cycle. Discussion with the representatives of the private railroads indicated that difficulties in executing agreements for 2010-2011 projects had discouraged their participation in the current call for projects. While it may be sufficient to wait for future programming cycles, the Group also recommends that locomotive repower projects be considered for contingency funding, intended to specifically to draw down the large CMAQ unobligated balance, perhaps as amendments to currently executed agreements, if that can be accomplished.

Finally, the vehicle technology proposals submitted did not reflect a systematic plan for improving the emissions of regional fleets. CMAP staff will explore the potential for such a plan, or for coordinating other plans, encompassing transit operators, municipal fleets, school buses and private railroads. This effort will be undertaken in cooperation with the U.S. Environmental Protection Agency, Illinois Environmental Protection Agency, and other agencies, with the expectation that it can help program funds administered through them.

Direct Emission Reduction CMAQ Proposals Qualitative Evaluation Ordered Summary

CMAQ ID	Sponsor	Brief Description	Average	Proximity to Sensitive Populations	Asthma Rates Near Project	Innovative or State of the Art Technology	Does Project Help Improve the Region's Public Fleets?	Proposal Total	Proposal Federal	cumulative federal
DR13123744	Metra	Metra UP Automatic Engine Start-Stop System	10.6	2.9	2.9	2.0	2.9	\$ 460,000	\$ 368,000	\$ 368,000
DR13123720	Pace	Transit Diesel Engine Retrofits - 2012	10.3	2.4	2.1	2.7	3.0	\$ 16,725,000	\$ 13,380,000	\$ 13,748,000
DR13123745	Metra	Metra MD Locomotive Repowers	10.1	2.6	2.7	2.3	2.6	\$ 5,000,000	\$ 4,000,000	\$ 17,748,000
DR13123743	Metra	Metra BNSF Replace Main Engine Drive Generator	9.9	2.6	2.4	2.0	2.9	\$ 1,150,000	\$ 920,000	\$ 18,668,000
DR13123746	IEPA	Chicago Area Clean School Bus Initiative	9.4	2.7	2.4	1.7	2.6	\$ 5,000,000	\$ 5,000,000	\$ 23,668,000
DR01123614	CTA	Purchase a ZF TopoDyn Program	9.1	2.9	2.7	1.6	2.0	\$ 1,116,000	\$ 892,800	\$ 24,560,800
DR01123606	CTA	Retrofit of Electronic Engine Cooling Fan/System	9.0	2.9	2.7	1.3	2.1	\$ 7,805,000	\$ 6,244,000	\$ 30,804,800
OT01123607	CDOE	Chicago Area Alternative Fuel Deployment Project, Phase 2	8.3	2.3	2.6	1.9	1.6	\$ 38,359,000	\$ 25,000,000	\$ 55,804,800
DR01123603	UIC	Emissions Reduction Program for UIC Fleet	7.6	2.4	2.4	1.6	1.1	\$ 782,000	\$ 625,600	\$ 56,430,400
OT13123629	IEPA	Partners for Clean Air Marketing	6.7	2.6	2.4	1.1	0.6	\$ 3,750,000	\$ 3,000,000	\$ 59,430,400
OT05123620	Berwyn	Charging Stations for Electric Vehicles	6.4	2.0	1.7	2.6	0.1	\$ 47,000	\$ 38,000	\$ 59,468,400
DR05123739	Berwyn	Fire Dept ESDA Vehicle Replacement	5.6	1.9	1.7	1.0	1.0	\$ 260,000	\$ 208,000	\$ 59,676,400
DR05123740	Berwyn	Fire Dept Pumper Vehicle Replacement	5.6	1.9	1.7	1.0	1.0	\$ 502,000	\$ 402,000	\$ 60,078,400
DR05123741	Berwyn	Public Works Fleet Vehicle Replacement 1989	5.6	1.9	1.7	1.0	1.0	\$ 130,000	\$ 104,000	\$ 60,182,400
DR05123742	Berwyn	Public Works Fleet Vehicle Replacement 1991	5.6	1.9	1.7	1.0	1.0	\$ 65,000	\$ 52,000	\$ 60,234,400
OT02123590	Winnetka	Electric Vehicle Charging Stations - Village of Winnetka	5.0	0.9	1.1	2.6	0.4	\$ 51,600	\$ 37,800	\$ 60,272,200
OT06123599	Orland Park	Purchase of 2 Electric Vehicles	4.6	0.7	0.9	2.3	0.8	\$ 80,600	\$ 64,500	\$ 60,336,700
OT06123596	Orland Park	Electric Charging Station Installations at six Orland Park Locations	4.4	0.7	0.9	2.6	0.3	\$ 382,200	\$ 305,800	\$ 60,642,500

Direct Emission Reduction CMAQ Proposals

Qualitative Evaluation Ordered Summary

